

CASE MOUNTAIN OPEN SPACE STUDY

MANCHESTER, CONNECTICUT



Eastern Connecticut Environmental Review Team Report

Eastern Connecticut Resource Conservation & Development Area, Inc.

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Manchester, Connecticut

Environmental Review Team Report

Prepared by the
Eastern Connecticut Environmental Review Team
of the
Eastern Connecticut
Resource Conservation and Development Area, Inc.

for the
Conservation Commission
Manchester, Connecticut

August 1998

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Acknowledgments

This report is an outgrowth of a request from the Manchester Conservation Commission to the Hartford County Soil and Water Conservation District (SWCD). The SWCD referred this request to the Eastern Connecticut Resource Conservation and Development Area (RC&D) Executive Council for their consideration and approval. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The Eastern Connecticut Environmental Review Team Coordinator, Elaine Sych, would like to thank and gratefully acknowledge the following Team members whose professionalism and expertise were invaluable to the completion of this report.

The field review took place on Tuesday, April 14, 1998.

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I would also like to thank Mark Connor, chairman of the conservation commission, Mary Savage, senior planner for the town of Manchester, Dick Whitehouse, representing the Connecticut Forest and Park Association, John Turchi and David Dunn, representing the CT New England Mountain Bike Association (NEMBA) and Jack McVeigh, a resident of Manchester, for their cooperation and assistance during this environmental review.

Prior to the review day, each Team member received a summary of the proposed project with location and soils maps. During the field review Team members were given additional plans and information. 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 plans or detailed solutions to development problems. The Team does not recommend what final action should be taken on a proposed project - all final decisions rest with the town. 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 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 Council hopes you will find this report of value and assistance in developing a management plan for this town owned parcel.

If you require additional information please contact:

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Introduction

Introduction

The Manchester Conservation Commission has requested assistance from the Eastern Connecticut Environmental Review Team in conducting a natural resource inventory and assistance with the development of a management plan for a parcel of town owned open space.

The 243 acre parcel is located in the southeast corner of Manchester between Spring Street and Birch Mountain Road. The land was purchased in 1974 for open space and recreation and has been left in its natural state except for approximately eight (8) miles of hiking trails that have been developed by the Conservation Commission.

There is no management plan for the area and in recent years the site has been an increase in the number of people using the area for hiking and mountain biking. There are also many hemlock groves and these are infested with the hemlock wooly adelgid.

Objectives of the ERT Study

The Commission has asked for a study to provide them with a natural resource inventory for the parcel so that they can begin to formulate a management plan and make informed decisions on use and protection of the area. Along with the natural resource inventory the Commission also asked for information concerning: erosion and sediment control on the trails and carriage path; wildlife and forestry habitat enhancement and management; educational opportunities; recommendations for dealing with the diseased hemlocks; vernal pool protection; and suitable passive and active recreational uses.

The ERT Process

Through the efforts of the conservation commission this environmental review and report was prepared for the Town of Manchester.

This report provides an information base and a series of recommendations and guidelines which cover the topics requested by the commission. Team members were able to review maps, plans and supporting documentation provided by the applicant.

The review process consisted of four phases:

1. Inventory of the site's natural resources;
2. Assessment of these resources;
3. Identification of resource areas and review of plans; and
4. Presentation of education, management and land use guidelines.

The data collection phase involved both literature and field research. The field review was conducted on Tuesday, April 14, 1998 and some Team members made additional site visits. The emphasis of the field review was on the exchange of ideas, concerns and recommendations. Being on site allowed Team members to verify information and to identify other resources.

Once Team members had assimilated an adequate data base, they were able to analyze and interpret their findings. Individual Team members then prepared and submitted their reports to the ERT coordinator for compilation into this final ERT report.

Figure 1.

Location Map

Scale 1" = 2000'

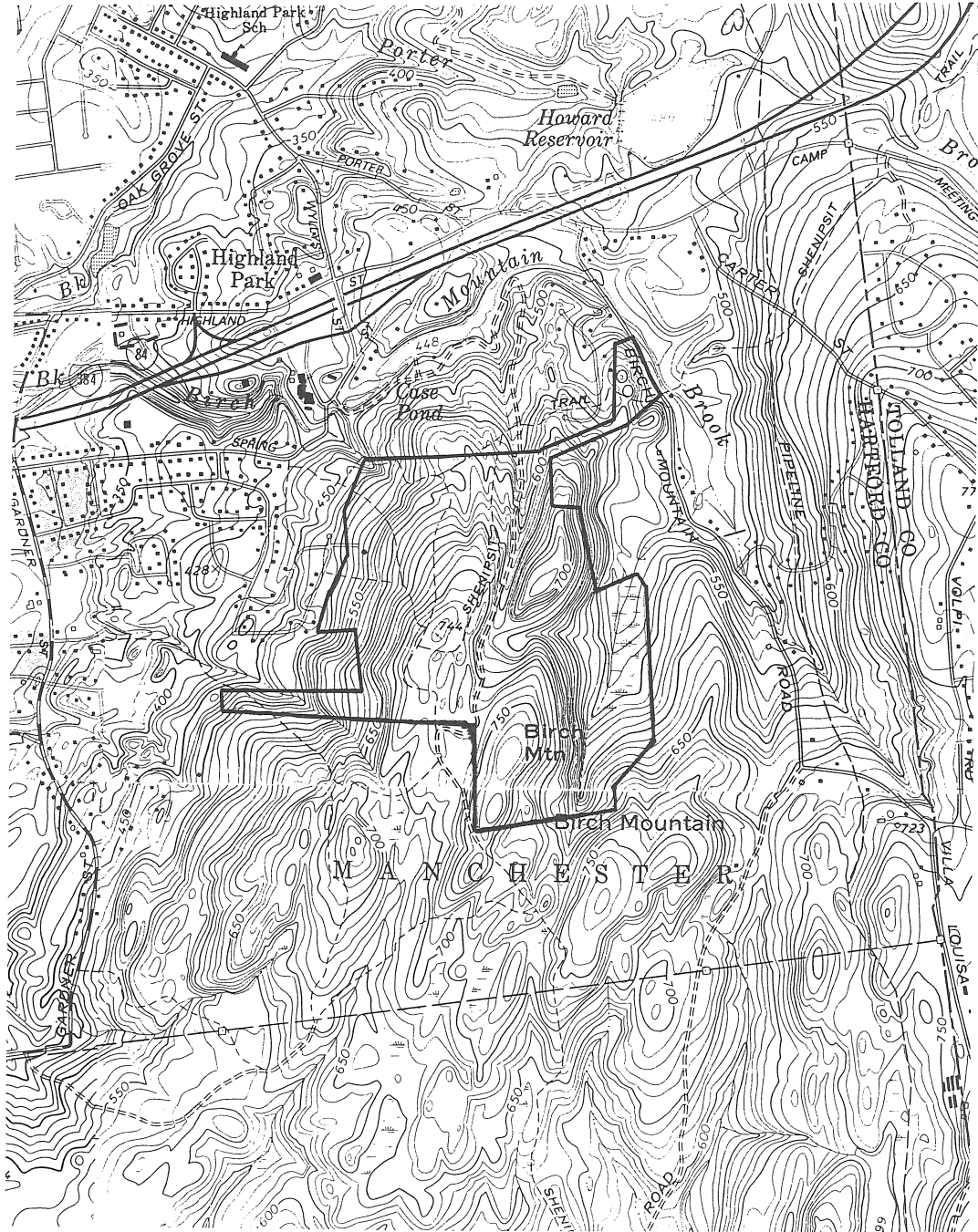


Figure 2.

Topographic Map

Scale 1" = 1000'

↑
N



Figure 3.

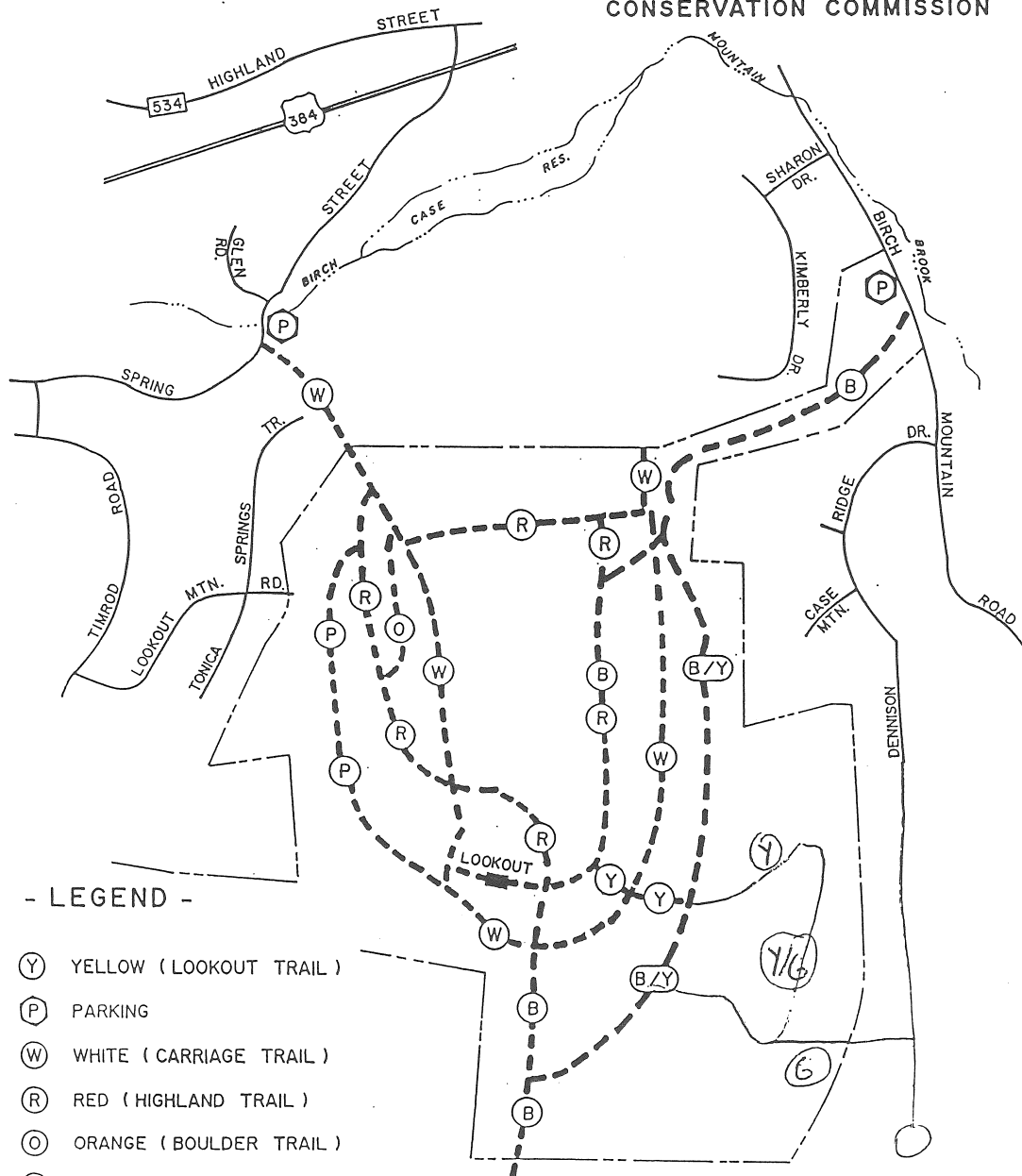


Trail Layout

NTS

WELCOME TO THE
CASE MOUNTAIN HIKING TRAILS

MAINTAINED BY THE MANCHESTER
CONSERVATION COMMISSION

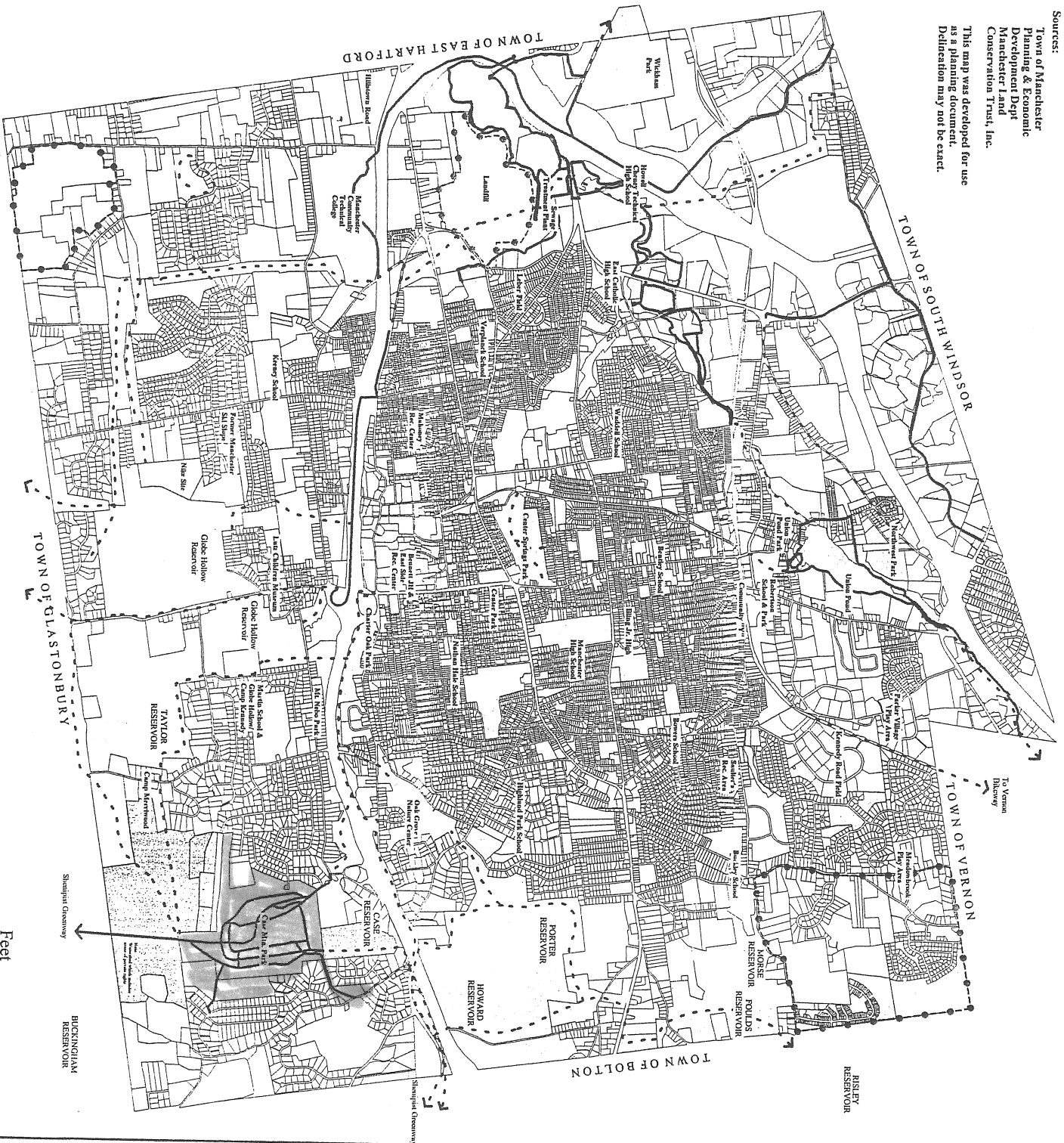


- LEGEND -









- (Y) YELLOW (LOOKOUT TRAIL)
- (P) PARKING
- (W) WHITE (CARRIAGE TRAIL)
- (R) RED (HIGHLAND TRAIL)
- (O) ORANGE (BOULDER TRAIL)
- (P) PINK (AZALEA TRAIL)
- (B) BLUE (SHENIPSIT TRAIL)
- (B/Y) BLUE / YELLOW (BIRCH MTN. TRAIL)

PLEASE NOTE : THE ACCESS TO THE TRAILS FROM SPRING ST. IS ON PRIVATE LAND AS ARE OTHER AREAS ADJACENT TO THE TRAILS.

Sources:
 Town of Manchester
 Planning & Economic
 Development Dept
 Manchester Land
 Conservation Trust, Inc.
 This map was developed for use
 as a planning document.
 Delimitation may not be exact.



LEGEND

-  Existing Recreation & Open Space
-  Acquire Open Space
-  Future Potential Recreation
-  Conservation Overlay
-  Zone Development Area
-  Proposed Trail
-  Proposed Bikeway
-  Existing Trail System

**Future Recreation
 & Open Space System**
 Planning and Zoning Commission
 Town of Manchester, Connecticut
 Plan of Conservation
 and Development



**HARRALL-MICHALOWSKI
 ASSOCIATES** Incorporated
 Hamden, Connecticut
 April 1997

Topography and Geology

Topography

The Case Mountain Open Space site straddles a NNE trending flat topped hill. Slopes on the hillside average 1 in 7. Steeper slopes are found along narrow linear NNE and WNW ravines which follow prominent fractures in the underlying bedrock. The picturesque western portion of the white trail is blazed along one of these bedrock ravines. Steep talus slopes and vertical 10-40 foot high rock cliffs form the walls of this 200 foot wide, 50 foot deep gorge. The near horizontal hill top is broken by a series of cuesta-like 5 to 10 foot high south facing rock cliffs formed by glacial plucking of large blocks of the homogeneous gneissic bedrock along the WNW fractures.

Bedrock Geology

The bedrock geology of Case Mountain is extremely simple. The site is underlain by one very homogeneous rock - the so-called "Glastonbury Gneiss." Originally formed 450 million years ago, the Glastonbury Gneiss started out as a coarse grained igneous rock crystallizing in large magma chambers which fed island arc volcanoes similar to those of the Japanese and Philippine islands today. The rock would have originally been classified as a granodiorite and would have been made up of roughly equal amounts of centimeter sized crystals of plagioclase feldspar (a sodium-calcium aluminum silicate), microcline (a potassium aluminum silicate) together with a small percentage of hornblende ~ a ferromagnesium silicate.) The Glastonbury suffered some recrystallization and deformation 400 million years ago when the island arcs of the Iapetus Ocean collided with the North American continental plate and again 240 million years ago when the Avalon continental plate rammed into North America. Although the microcline was largely unaffected the deformation induced the

recrystallization of the hornblende to biotite and epidote and the plagioclase to a finer grained granular aggregate. In order to accommodate the deformation the rock took on a gneissic texture. The biotite became aligned in pencil like aggregates several centimeters long and the rock developed a strongly lineated gneissic texture. On Case Mountain the biotite lineation trends North-South and is nearly horizontal. The biotite flakes in the pencil aggregates show very little tendency to be oriented and as a result a foliation is only subtly developed. Where conspicuous, the foliation seems to strike North-South and dip steeply. The homogeneity of the gneiss is interrupted only by a few widely spaced granite pegmatite and apillite dikes.

200 million years ago Connecticut was situated in the middle of the large supercontinent of Pangea when it began to fracture and break up. The Hartford Mesozoic basin, now filled with a thick sequence of red colored sedimentary rocks developed along the trace of one of the major crustal scale fractures formed during the initial stages of this breakup. This fracture, the so-called, border fault passes just west of the Case Mountain reserve and is actually exposed in the bed of Birch Mountain Brook at the Wyllys Copper Mine (see Bedrock Geology map - Figure 4). The displacement along the border fault at this site could easily amount to several thousand feet - a major fault indeed! The fact that the border fault trends NNW parallel to the steep sided ravines on Case Mountain suggests the prominent topographic lineaments evident on air photos (see Topographic Lineament map - Figure 5) represent easily eroded zones of intensely fractured rock along parallel faults. Further support for this conclusion is the systematic (faulted?) offset of some of the WNW by the NNW lineaments. These fractured zones should be highly permeable to groundwaters and are probably the source of the several springs noted on Case Mountain.

In addition to WNW and NNW vertical joints the bedrock on Case Mountain splits readily along near horizontal sheeting joints. These fractures formed parallel to the pre-glacial (prior to 100,000 years ago) topography as a result of erosion. The fact that the NNW trending ravines cut the sheeting joints demonstrates that their erosion is directly related to recent glacial meltwaters.

Surficial Geology

Only a thin (0 to 10 foot) veneer of unconsolidated loose glacial till covers much of Case Mountain. The surface of the underlying bedrock has been smooth and polished by subglacial erosion 15,000 - 30,000 years ago. On the flat hilltop areas the smooth pavement of polished bedrock is interrupted by small 10 foot high south facing steps formed when large blocks of the Glastonbury Gneiss were plucked by the flowing ice. A number of these blocks, so-called glacial erratics, are scattered over the surface where they were dropped by the ice on melting. The steep sided NNE trending ravines were probably eroded subglacially by rapidly flowing meltwaters. The western wall of the gorge along the "white" trail may well have been undercut by subglacial streams - the huge talus blocks at the base of the small cliffs are explicable only if they were originally part of a major overhang.

As ice melted and the crest of Case Mountain was exposed a significant amount of sediment laden melt waters seem to have been concentrated along its western slope. A 1 to 3 foot thick veneer of water-washed pebbly red colored till covers much of the western hillslope. A break in slope at roughly the 500 foot elevation defines the edge of a thicker deposit of stratified sands and gravels which accumulated behind ice blocks once Case Mountain was completely clear of ice (Surficial Geology Map - Figure 6). Rounded pebbles and cobbles of redbed sediments in the stratified drift and ablation till on the western side of Case Mountain indicate that remnant ice in the Connecticut River valley was the principal source of the meltwaters involved.

References

The Case Mountain Open Space site is located in the southwestern corner of the Rockville Quadrangle. The published geologic information for the Rockville

Quadrangle is limited. No modern bedrock or Surficial maps exist. The 1 :125,000 maps of Rodgers (1985) and Stone (1990) represent the best information available.

Rodgers, J., 1985. Bedrock Geological Map of Connecticut. Connecticut Geological and Natural History Survey.

Stone, J. R., 1992. Surficial Materials Map of Connecticut, Connecticut Geological and Natural History Survey.

Figure 4
Bedrock Geology
Scale 1" = 2000'

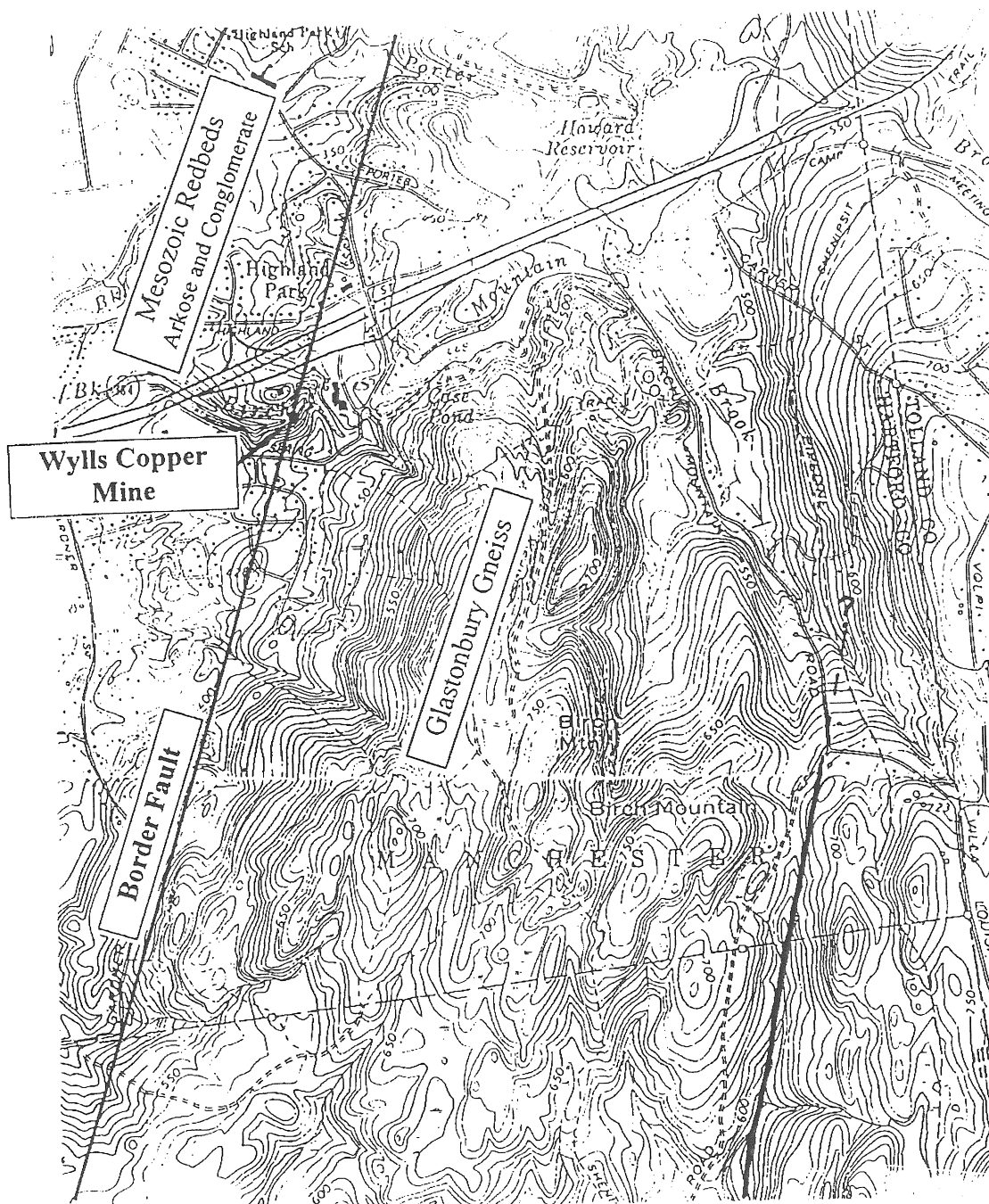
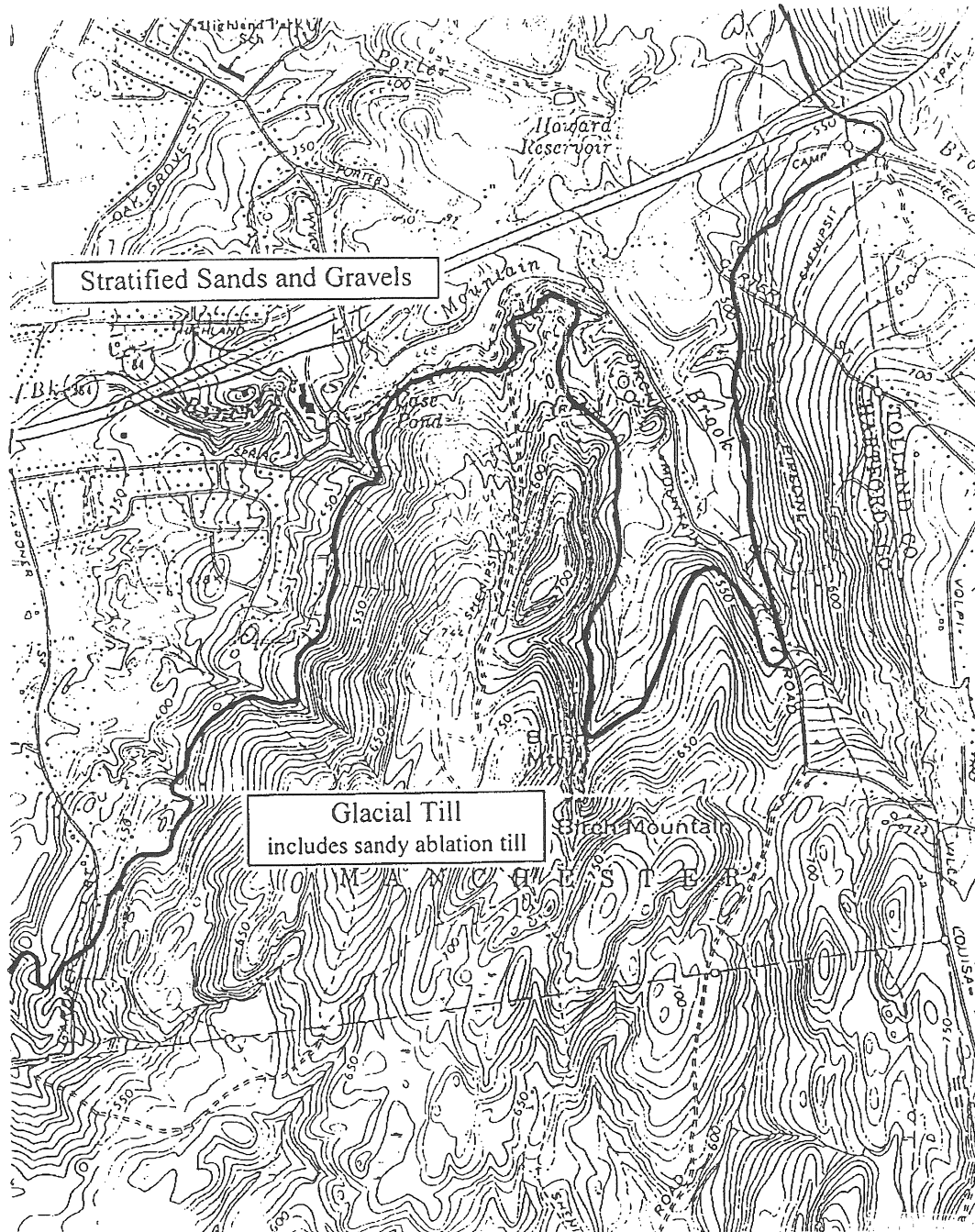


Figure 5
Topographic Lineaments
Scale 1" = 2000'



Figure 6
Surficial Geology
Scale 1" = 2000'



Soil Resources

Soil Resources

The general mapping unit descriptions from the USDA Hartford County Soil Survey, 1962, shows that most of the site contains a range of well drained to excessively drained soils including, Cheshire, Ellington, Gloucester, Hartford, Hollis and Terrace Escarpment soil types. Exposed bedrock, referred to as Rocky Land, can be found along the highest points of the trail system. Leicester, a poorly to very poorly drained soil is located on the eastern border of the property. Most soils on site tend to be well drained and well-suited for recreation trails if properly installed and maintained. Some wet area crossings may be needed in the poorly drained soil types.

Existing Trail Conditions

From an erosion control standpoint, the existing trail system does not have significant concerns. There is gully erosion on the northern section of the carriage trail which has been effectively addressed by the relocation of the trail and installation of water bars.

Some wet areas located on the trail are currently passable by rocks. The trail avoids most wet areas and in general does not significantly impact wetland features. There are three areas along the trail that contain vernal pools. Foot traffic in these areas may be harmful to wildlife that use these fragile habitats.

Planned Trails

As new trails are planned, avoidance of long steep sections of trail will help to reduce erosion. Creating a "switchback" trail configuration on slopes and using water bars to divert water off the trail to a stable outlet are erosion control practices that can be effective. To reduce erosion and excessive impact to wetland areas, trails should be kept

in the upland soils when possible. Trails within wetland areas should be located along the periphery, where there is less soil saturation. Limiting access to vernal pools by using well-defined side trails and a buffer of dense vegetation will help protect these fragile ecosystems.

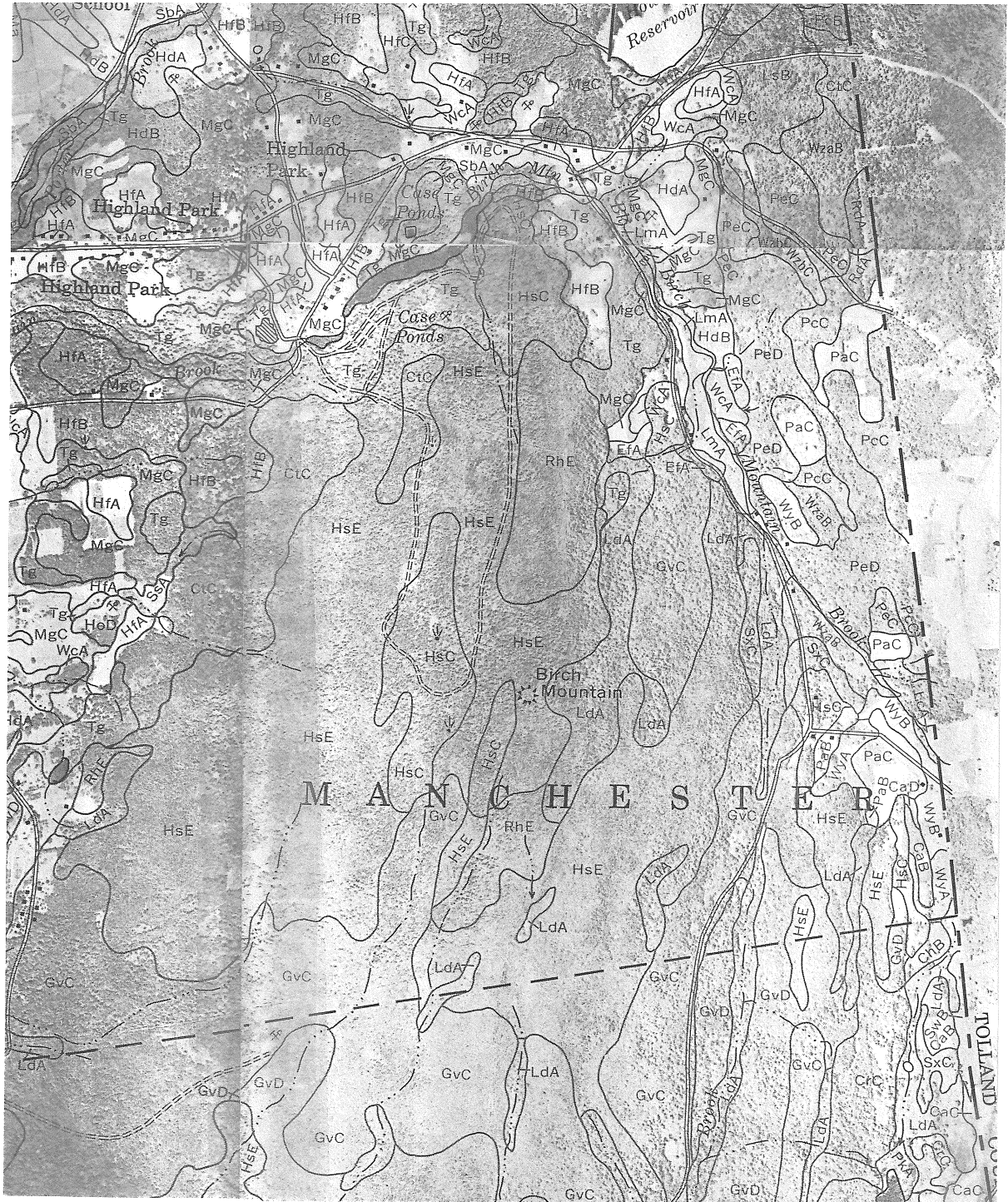
Caution should be taken in areas mapped as "Tg", Terrace Escarpments, on the soils map, specifically near the Birch Mountain Road entrance. Any proposals at the tops of these slopes need to include storm water runoff plans that outlet water into a stable outlet at the bottom of these slopes. Outletting water at the top or middle of Terrace Escarpment slopes can cause severe erosion by cutting into clay layers, which can slip from underneath sandy soil layers.

For more information about the soils on-site, please refer to the non-technical soils description report, tables showing soil suitability for wildlife habitat and recreational development (including paths and trails). (See Appendix A).

Figure 7

↑
N

Soils Map
Scale 1" = 1667'



Wetland Review of Vernal Pools

Of specific concern to the Manchester Conservation Commission, as it related to wetlands, was how to protect the many vernal pools present on this site. Please refer to Appendix B for a copy of a portion of A Guide to the Identification and Protection of Vernal Pool Wetlands of Connecticut entitled "What Are the Threats to the Integrity of Vernal Pools and How Can They Be Protected?." This section deals primarily with large-scale land development and forestry activities. While large-scale development is most likely not a concern here, forestry activities (especially hemlock salvage) and also recreation (hiking and biking) are activities which are relevant.

During the ERT inspection of some of these vernal pools, the Team wetland specialist noticed only one concern at the present time. One of the biking/hiking trails appeared to flow through the edge of one of the ponds. Since the areal extent of these pools may vary from year to year based on rainfall amounts, it is recommended that trails be kept outside of what appears to be the maximum, historical extent of the pool.

Amphibian egg masses are commonly laid on the shallow edges of vernal pools where vegetation is present for attachment. Riding bicycles through this area of the pool may destroy these egg masses.

There was also a concern about people gathering in the middle of a vernal pool basin during its dry period and what effect it may have on its ecosystem. Vernal pools are most useful to its obligatory amphibian species during their breeding season of late March to mid-April. After this time these species travel away from the pool into upland habitats to live out the majority of their life cycle. Utilizing this area for recreation during the dry period of late spring and summer should have no great effect

on it ecosystem as long as there is no significant destruction of vegetation or removal of detritus form the forest floor.

The Natural Diversity Data Base

The Natural Diversity Data Base maps and files regarding the area have been reviewed. According to our information, *Clemmys insculpta* (Wood Turtle) a State Special Concern Species, may occur in the vicinity of this property.

Wood turtles require riparian habitats bordered by flood plains, woodlands or meadows. Their summer terrestrial habitat includes pastures, old fields, woodlands, power line cuts and railroad beds bordering or adjacent to streams and rivers. Their hibernating habitat includes tree-lined rivers with undercut banks and muddy bottoms. They hibernate submerged in tangled tree roots or in deep pools from November 1 to April 1. This species has recently been negatively impacted by the loss of suitable habitat and was listing as Special Concern when the new endangered species regulations went into effect on February 24, 1998.

No detailed plans of the site were reviewed nor was a field inspection made for this review. If you have any additional questions concerning the wood turtle you may contact Julie Victoria at (860) 642-7239.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Natural Resources Center's Geological and Natural History Survey and cooperating units of DEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as,

enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

Also be advised that this is a preliminary review and not a final determination. A more detailed review may be conducted as part of any subsequent environmental permit applications submitted to DEP for the proposed site.

Wildlife Resources

This section will address the following: current conditions for wildlife, recommendations for habitat management and enhancement, and projected wildlife impacts.

Current Conditions

Field Observations and Notes

The 243 acres of Case Mountain Area contains a variety of conditions and habitat types and provides habitat for a variety of wildlife. The area offers many opportunities for nature education and recreation. The following wildlife were observed during the field visits either directly or indirectly by identifying calls, tracks, scat or other sign: whitetail deer (*Odocoileus virginianus*), red fox (*Vulpes vulpes*), river otter (*Lutra canadensis*), gray squirrel (*Sciurus carolinensis*), eastern chipmunk (*Tamias striatus*), meadow vole (*Microtus pinetorum*), short-tailed shrew (*Blarina brevicauda*), American robin (*Turdus migratorius*), wood thrush (*Hyocichla mustelina*), great crested flycatcher (*Myiarchus crinitus*), gray catbird (*Dumetella carolinensis*), northern cardinal (*C.ardinalis cardinalis*), mourning dove (*Zenaida macroura*), American crow (*Corvus brachyrhynchos*), bluejay (*Cyanocitta cristafa*), common grackle (*Quiscala quiscala*), downy woodpecker (*Picoides pubescens*), red-eyed vireo (*Vireo olivaceus*), eastern wood-pewee (*Contopus virens*), yellow warbler (*Dendroica petechia*), chipping sparrow (*Spizella passerina*), scarlet tanager (*Piranga olivacea*), eastern towhee (*Pipilo erythrophthalmus*), Ovenbird (*Seirus aurocapillus*), black-capped chickadee (*Parus atricapillus*), tufted titmouse (*Parus bicolor*), eastern American toad (*Bufo a. americanus*), bull frog (*Rana catebeiana*), and wood frog (*Rana sylvatica*). One dog (domestic) offleash near white trail.

Planning for Wildlife

The large acreage and juxtaposition to other large water company property makes this property highly valuable for wildlife. As urbanization of the surrounding landscape continues, land holdings of 200 or more acres will become scarce. Several wildlife species which are adversely effected by urbanization and fragmentation are present on the property (i.e. ovenbird, red-eyed vireo, scarlet tanager, and eastern wood-pewee). Publically owned lands are valuable when managed for the long term benefit of wildlife. Large parcels of land such as the Case Mountain property can be places that local citizens can view wildlife which require larger forest sizes. Case Mountain is situated near urbanized areas and can be a place for citizens to enjoy wildlife in relatively close proximity to where they live. In a survey of urban residents in five metropolitan areas of New York State, 93 percent of the respondents indicated that it was important for their children to learn about nature and 73 percent were interested in wildlife in the backyard or neighborhood area (Brown et al. 1979).

The distribution and combination of various of vegetative types and tree size classes are important to consider when managing forest land for the long term. In general, the greater the range of tree size classes present, the greater the potential that more wildlife species will present (Degraaf et al. 1992). Important to wildlife habitat is the vertical and horizontal structural diversity. The vertical layering of the trees, shrubs, vines, herbs and thallophytes (lichens and mosses) and the horizontal diversity (known as "patchiness") of the forest are important to consider to encourage diverse wildlife habitat conditions. Professionally applied modern forestry operations can be utilized to manage and enhance wildlife habitat by encouraging vertical and horizontal structural diversity. It is recommended that the town hire a reputable professional forest consultant to assess the property and write a long range plan for this property with the goals and objectives of the property owner.

Nature Trail Development and Trail Guide

Wildlife habitat is represented by the collective summation of all the environmental factors that occur at a given location such as food, water, cover and their spatial arrangement. As Manchester's natural areas become smaller and more isolated, the value of publicly-owned natural areas will increase. The remaining natural areas will be important as refugia for wildlife and places to observe natural vegetation and the associated wildlife. The property can be useful in teaching the citizens of the community how to recognize the various components of habitat and help them understand the function of habitat and the importance of habitat for the existence of wildlife. With careful planning, this area has the potential to be an effective learning environment. The property can be utilized to teach residents how to recognize the various habitat components and also have some "take home" messages or ideas on how to manage their own properties; big or small. The trail system can serve to point out the varying habitat types and other points of interest on the property. The various habitat components can be broken into the following categories:

Spring foods	Herbaceous plants and wildflowers
Summer foods	Nectar plants
Fall foods	Dead and dying trees
Winter persistent foods	Artificial nest boxes
Conifers and evergreens	Man-made brushpiles/rock piles
Nut sources	Water sources/ Vernal pools

Each identified habitat component contributes, in some way, to the ecology of the property. The various habitat components can be identified by trail markers or signs. A trail guide can be developed which corresponds to numbers along the trail. This can reduce the maintenance of signage and requires trail users to pick up a guide from a centralized trail head, school office or town hall.

Wildlife Refuge Issue

Nature trails should not be allowed to criss-cross the entire property. Trails should allow some parts of the property to remain as refugia where wildlife remain undisturbed by large volumes of foot traffic especially during the nesting season. Hikers should be informed about the need for leaving some areas undisturbed. Although there are over 200 acres of land, too many trails and too many people can be detrimental to some wildlife that seek seclusion. Currently, the area is saturated with trails. Consolidation of trails is recommended and an area (representing at least 25 percent of the property) designated as "no hiking access" is recommended in the vicinity of the yellow and green trails.

Human - Wildlife Conflicts and Unleashed Dogs Along Trails

There are wildlife-related problems which become apparent as public nature trail areas usage increases. Some trail users want to bring their dogs along with them. Although leash laws are in place, they are seldom adhered to or adequately enforced (personal observation). Unleashed dogs along trails pose human dangers through biting but can also adversely impact the wildlife resource. Particularly affected are ground nesting birds and mammals in the spring and summer seasons. As trail users walk along trails, unleashed dogs may disturb ground nesters. Repeated disturbance of ground nesters may lead to nest abandonment. Also, dogs allowed to run through or jump into vernal pools can also be destructive to these special habitat areas. A ban on dogs in the natural area starting March 1st through September 30th would help avoid the wildlife impacts. Dogs, under the owner's control, do not pose a major problem for wildlife in the fall and winter periods.

Habitat Management and Planning Considerations

The property needs to have a long term habitat management plan which encompasses the goals and objectives for increasing and maintaining biodiversity. Also, in concert, with the habitat management, a plan is needed for utilizing the property for recreation.

As properties are developed, natural areas are divided into smaller, isolated pieces. Land that is in public ownership can be managed for wildlife habitat for the long term. In contrast, private land, which consists of 88 percent of the land in Connecticut, usually changes ownership and is not managed for wildlife for the long term. This publically-owned property can be a place where habitat is improved and managed for wildlife for the enjoyment and learning experience of area citizens. Publically owned land can also be a place for citizens to learn more about wildlife and our natural heritage.

Since European settlement, several invasive non-native woody plants have been introduced to Connecticut's landscape (see partial list below). Unfortunately, many natural areas have seen a dramatic increase in invasive non-natives which displace more valuable native plants. The Case Mountain property is faring well, however property managers should have a policy and standard operating procedures for dealing with the removal of invasive non-native plants. Timely and opportunistic removal of invasives will help curtail their spread throughout the property. Controlling invasive non-native plants will require a diligent application of mechanical removal by hand, pick and shovel, and tractor (back-hoe). Also, application of herbicides may be necessary for some invasives to prevent resprouting of cut stumps (if herbicide use is a major concern - least environmentally sensitive compounds can be used). The need for controlling invasive non-natives outweighs the risks of utilizing herbicides. For current information on herbicides and their use contact research scientist, Todd Mervosh, of the Ct Agricultural Experiment Station in Windsor CT.

Planting various trees, shrubs and wildflowers will enhance the seasonal food sources and improve habitat conditions. Plant materials should be of native sources as much as possible. Plant species which restore and enhance natural habitat conditions should be utilized and invasive non-native species avoided. The following is a partial list of non-native plants which **should not be planted**:

Trees

Norway Maple (*Acer platanoides*)

Tree of Heaven (*Ailanthus altissima*)

Catalpa (*Catalpa spp.*)

Shrubs

Autumn Olive (*Elaeagnus umbellata*)

Russian Olive (*Elaeagnus angustifolia*)

Winged Euonymus (*Euonymus alatus*)

Burning bush (*Euonymus atropurpureus*)

Privet (*Ligustrum spp.*)

Tartarian honeysuckle (*Lonicera tatarica*)

Common buckthorn (*Rhamnus cathartica*)

Glossy buckthorn (*Rhamnus frangula*)

Multiflora rose (*Rosa multiflora*)

Vines

Asiatic bittersweet (*Celastrus orbiculatus*)

Japanese honeysuckle (*Lonicera japonica*)

Eastern Hemlock Decline and Management

A major habitat management issue for the Case Mountain property is how to manage the declining eastern hemlocks due to the woolly adelgid (*Adelges tsugae*) infestation. Because the woolly adelgid is an introduced non-native insect, there aren't any currently known Connecticut insect predators. The Eastern hemlock has several attributes which make it a valuable habitat component. It is the most shade tolerant evergreen found in the forest. Wildlife seek evergreens for shelter and predator avoidance especially during the fall and winter. There are approximately 60 acres of hemlock on Case Mountain. This represents about 21 percent of the coniferous cover for the town of Manchester (see table 1, DEP Land cover statistics). This does not include the mixed hardwoods and the softwoods-hardwoods cover types where hemlock also occurs. In larger stands on the property, a limited harvest of hemlocks can help fund the replanting of the forest with other evergreens such as white pine. Replanting the area with evergreens (white pine, white spruce, or norway spruce) helps restore the evergreen component which helps mitigate the loss of the hemlock's evergreen attributes (see Appendix C for "Proactive habitat management . . ." paper). The Connecticut Agricultural Experiment Station's scientist (Dr. Mark McClure) is studying the woolly adelgid issue and should be contacted for updates on his research aimed at controlling the insect pest.

Table 1.

Manchester 17,705.20 acres 27.66 square miles

Land Use/Land Cover	Acreage	Square Miles	Percent
Impervious Surface	574.15	0.90	3.24
Residential High Density	1,196.89	1.87	6.76
Residential Medium Density	3,740.48	5.84	21.13
Roof Surface	108.06	0.17	0.61
Road (Pavement)	55.37	0.09	0.31
Grass (Turf)	574.72	0.90	3.25
Soil (Grass/Hay)	747.74	1.17	4.22
Grass (Hay/Pasture)	874.67	1.37	4.94
Soil (Corn)	51.36	0.08	0.29
Grass (Corn)	7.56	0.01	0.04
Forest (Deciduous)	6,592.11	10.30	37.23
Forest (Coniferous)	285.79	0.45	1.61
Water (Deep)	112.72	0.18	0.64
Water (Shallow)	178.17	0.28	1.01
Wetland (Nonforest)	8.00	0.01	0.05
Wetland (Forest)	309.55	0.48	1.75
Land (Barren)	579.86	0.91	3.28
Soil (Bare)	605.85	0.95	3.42
Road (Major)	1102.15	1.72	6.23

Note: Statistics are from DEP - Natural Resources Center/Geographic Information Systems updated August 30, 1996. The land use categories listed are only those found within the town.

A balance between leaving dead or dying trees (snags) and removing them needs to be struck. Dead or dying hemlocks may pose some danger to hikers along trails, however dead or dying wood is part of habitat for wildlife, especially for woodpeckers and a whole host of secondary users such as screech owls (*Otus asio*), bluebirds (*Sialia sialis*) and flying squirrels (*Glaucomys volans* or *sabrinus*). A minimum of 3 -5 snags (dead or dying trees) per acre should be present or created per acre of forested area. Larger snags are more valuable, although snags as small as 3 inches in diameter are utilized by wildlife. Snags can also be created by cutting two complete bands through the bark with a chainsaw or ax (type of trees and technique information is available from Team DEP forester or wildlife biologist).

Lookout Area Vegetation Management

The lookout area's vegetation is becoming quite tall and obstructing the landscape view. Maintaining the landscape view requires maintaining the vegetation. A habitat enhancement practice which is recommended here is "Creation of an Forest Opening ." Through the removal of overstory vegetation, the understory shrubs will be enhanced and increase in density and their berry production. There are several good understory berry producers in the understory at this location which can benefit from additional sunlight:

- Lowbush blueberry (*Vaccinium angustifolium*)
- Black Huckleberry (*Gaylussacia baccata*)
- Red and Black Chokeberry (*Aronia arbutifolia* and *melanocarpa*)

These berry producers will increase the availability of summer foods in the area. Especially benefitting are many of the nesting songbirds. The forest opening needs to be maintained over the years to remove stump sprouts and/or other competing vegetation.

Deer Influence on Vegetation

Deer browsing of understory vegetation is quite apparent throughout the property, however, it is heaviest in the southern part of the property. Deer can impact the habitat of other wildlife (i.e. ground nesters) through excessive browsing and removal of understory cover. Deer are capable of altering plant species abundance and composition by their foraging (Frelich and Lorimer, 1985; Alverson et al, 1988). Management of the deer herd on the Case Mountain property may become necessary to help maintain biodiversity. Deer program biologists from the Department of Environmental Protection's wildlife division are available for technical advice upon request (Howard Kilpatrick, wildlife biologist -Tel. 860-642-7239)

Practical Wildlife Censusing Techniques

Counting or documenting the presence or absence of wildlife along the trail can be both fun and educational for the trail users. It also teaches the importance of record keeping and identification of wildlife (directly or indirectly).

- Locate nests and other wildlife occurrences
 - seasonally locate nests and plot locations on maps
 - find den trees and natural cavities in trees and find out what animal is using it.
- Owl hooting Survey
 - play and owl hooting tape and listen for response
- Bird Count
 - document their seasonal presence
- Snow tracking
 - following a light snowfall (2-3 inches), animal tracks can be identified and followed to see where they are travelling to and from. Also, they may detect what the animal is doing or eating.

Local schools and/or conservation groups can participate in documenting wildlife presence through nature education programs. Manchester schools are encouraged to have their teachers contact the DEP office of communication and education to have teacher training workshops in Project Wlld, Project Learning Tree, and Project Wet.

More Information

The Case Mountain property provides the town of Manchester a unique opportunity to bring its citizens closer to nature and, at the same time, show them practical habitat management techniques that are “take home” messages. This report provides only a handful of ideas for the property. For more information and further technical help

please contact the Team Wildlife Biologist at DEP Wildlife Division, Sessions Woods Wildlife Management Area, Route 69, Burlington, CT 06013, Tel. (860) 675 -8130.

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Vegetation and Forestry Review

The ±243 acre Case Mountain Open Space Area was purchased by the town in 1974. Except for the development of hiking trails which are maintained by the Manchester Conservation Commission the area has been left in its natural state. This tract has the potential to provide environmental education opportunities which would have value to all ages.

In general many of the trees which are present are declining in overall health and vigor. For the hardwoods this is due primarily to the over crowded condition which exists, for the hemlock it is a result of infestation by the hemlock woolly adelgid and elongate hemlock scale. On portions of the tract, poor site conditions create additional stresses that may lower a trees resistance causing a greater susceptibility to disease and insect infestations. Sound forest management is an integral part of the maintenance of a healthy forest environment. Site limitations such as excessively steep slopes or extreme rockiness may preclude forest management from some areas.

The vegetation which is present on this property falls into several broad categories. These include Mixed Hardwoods, Softwoods/Hardwoods, Hemlock, Oak Ridge, Hardwood Swamp, Open Land and Vernal Pool sites. Below are brief descriptions of each of these vegetation categories. The location and acreage of these areas were obtained from 1995 aerial photographs and are only approximate. They are depicted on the Forest Vegetation Map. The inventory of vegetation types was conducted in late May. A more comprehensive inventory of the herbaceous vegetation which is present in each of these categories should be made at different times throughout the year by a botanist.

A. Mixed Hardwoods:

The Mixed Hardwood type totals approximately 73 acres and is dispersed throughout the property. This type is made up of reasonably healthy sawtimber size trees (11" in diameter at breast height (d.b.h.) and larger) and pole size trees (5" to 11" d.b.h.) which range from 80 to about 120 years of age. In general the trees are somewhat crowded and beginning to decline in health and vigor. The more exposed trees show some signs of damage caused by ice, snow and wind storms that have occurred throughout the years. Larger and older trees are present but they are few in number and widely scattered. The overstory is dominated by red oak, black oak, scarlet oak, white oak, chestnut oak, black birch, red maple, shagbark hickory, pignut hickory and mockernut hickory. Occasional sugar maple, American beech, eastern hemlock and white pine are also present. White ash, yellow birch and tuliptree are included where the mixed hardwood type makes a transition to the hardwood swamp type and also along streams and seeps. The understory vegetation which contains maple leaved viburnum, hophornbeam, American hornbeam, azalea, beaked hazelnut, American chestnut sprouts, witch-hazel, highbush blueberry, lowbush blueberry, huckleberry, sheep laurel, sweet pepperbush and occasional white pine seedlings. Ground cover vegetation includes poison ivy, Virginia creeper, green briar, raspberry, Canada mayflower, wild sarsaparilla, bluets, day Lily, starflower, wood aster, club moss, evergreen wood fern, hayscented fern, bracken fern, Christmas fern and many other species of grasses, sedges and wild flowers.

B. Softwoods/Hardwoods:

Approximately 60 acres of the softwoods/hardwoods vegetation type are present within this parcel. Between 40% and 60% of this vegetation type is made up of Pole to sawtimber size eastern hemlock with white oak, black oak, chestnut oak, red oak, scarlet oak, black birch, red maple, yellow birch, sugar maple, white ash, sassafras, American beech, shagbark hickory, mockernut hickory, pignut hickory and scattered large white pine intermixed. In many areas the hemlock are infested with the hemlock woolly adelgid and appear to be declining (see Management Considerations below). Understory vegetation is light where the hemlock are still healthy and cast dense shade. In areas

where the adelgid infestation is heavy and the hemlock are declining the understory is moderate and includes hemlock seedlings, hardwood tree seedlings, mountain laurel, highbush blueberry, lowbush blueberry, huckleberry, witch-hazel, maple leaved viburnum, hophornbeam and American hornbeam. Multiflora rose* and Japanese knotweed* have become established along some of the more open trails which traverse this area. Poison ivy, club moss, Christmas fern, hayscented fern, Canada mayflower, spotted wintergreen, grasses and sedges were observed as ground cover where filtered sunlight reaches the forest floor.

C. Hemlock:

The hemlock type occupies several areas and totals approximately 60 acres of this tract. All size classes of eastern hemlock make up at least 60% of the trees found in this vegetation type. The other tree species that are present include all size classes of the oaks, birches, maples, hickories, American beech and occasional white pine. The hemlock woolly adelgid is present along with the elongate hemlock scale and the condition of infested trees is variable. Understory and ground cover vegetation is lacking in most areas due to the dense shade created by the closed hemlock canopy. In areas where the adelgid infestation has caused severe decline or mortality and sunlight can penetrate to the forest floor, groundcover vegetation has become established. In these areas hardwood tree seedlings (dominated by black birch), raspberry, blackberry, poke weed, maple leaved viburnum, aster, grasses and sedges have become established.

D. Oak Ridge:

The oak ridge vegetation type occupies approximately 32 acres of this property. This vegetation type is found on the excessively drained, very stony shallow to bedrock knolls and side hills that are present. The vegetation which dominates these sites is made up of somewhat stunted and malformed pole sized chestnut oak, scarlet oak, white oak, and black oak with scattered mockernut hickory and pignut hickory. Red maple, black birch, sassafras and white pine are also present in the overstory, but in lesser numbers. Understory vegetation includes hardwood tree seedlings, American

chestnut sprouts, choke cherry, witch-hazel, maple leaved viburnum, lowbush blueberry, huckleberry, green briar and scattered mountain laurel. Ground cover consists of Pennsylvania sedge, Canada mayflower, pink lady's-slipper, club moss, poison ivy, Virginia creeper, hayscented fern and bracken fern.

E. Hardwood Swamp:

There are approximately 16 acres of the hardwood swamp vegetation type present within this parcel. These wetland areas are either at the headwaters of drainages or are located in the flats at the base of steep slopes. The vegetation which is present is somewhat variable with all size classes and age classes of trees represented. Each wetland is dominated by red maple with occasional yellow birch, black gum, white ash, sugar maple, red oak, American elm, black birch, tuliptree and hemlock intermixed. Many of the larger trees in these wetland areas have cavities which make excellent den sites for many species of wildlife. Understory vegetation includes spice bush, sweet pepperbush, American hornbeam, highbush blueberry, swamp azalea, winterberry, witch hazel and swamp rose. Skunk cabbage, false hellebore, tussock sedge, club moss, sphagnum moss, poison ivy, Virginia creeper, green briar, cinnamon fern, Christmas fern, sensitive fern, evergreen wood fern, royal fern, steeplebush, meadowsweet, Canada mayflower, aster spp., sedges and other wild flower species are present as ground cover.

F. Open Land:

This area, which is called the "lookout", totals just less than one acre. The vegetation which is present must be periodically cut to maintain the spectacular view of the surrounding landscape. Seedling and sapling size sprouts of scrub oak, black oak, scarlet oak, red oak, white oak, chestnut oak and American chestnut are present along with pitch pine, gray birch, aspen, choke cherry and shadbush. The shrub species that are present include maple leaved viburnum, red chokeberry, fly honeysuckle*, Tartarian honeysuckle*, lowbush blueberry and huckleberry. Herbaceous vegetation includes hawk weed, goldenrod, whorled loosestrife, ox-eyed daisy, raspberry, blackberry,

dewberry, common cinquefoil, false Solomon's seal, spotted wintergreen, St. John's wort, sundrops, blue-eyed grass, aster spp., sweet fern, bracken fern, sedges, grasses and other weed and wildflower species.

Vernal Pools:

Three vernal pools were located on the property. Combined they total approximately one acre. Several smaller vernal pools may also be present but they were not located during the field investigation. The tree species that are present around the perimeter of these pools include red maple, black gum, black birch, red oak, tuliptree, white ash, yellow birch and hemlock. The shrub species that are present are dominated by button bush, winterberry, swamp azalea, highbush blueberry, sweet pepperbush and witch-hazel.

**Invasive exotic vegetation has become established on some of the review site especially in openings along trails. Of special concern are several invasive plant species which have the potential to become major components of the ecosystem by out competing native species. These include Tartarian honeysuckle, fly honeysuckle, Japanese knotweed and multiflora rose. Although some of these species provide wildlife with food and cover, they are aggressive competitors with native plant species. In some areas the presence of one or more of these species may precluded the establishment of other more desirable native plant species. Mechanical removal or chemical control of these plants is effective but will become more difficult as they become more widespread.*

Management Considerations

The long term maintenance of a healthy forest environment is feasible through management on just over half of this property. Poor access, steep slopes, extreme rockiness and low soil productivity limit the feasibility of forest management on the remaining portion.

The removal of risk and hazard trees and the maintenance of healthy vigorous trees which are less likely to be adversely affected by insect and disease infestation should be

of major concern in the management of this property. In the future, sawtimber improvement thinnings focused on the removal of unhealthy and damaged trees which are competing with trees of high potential could be implemented within the mixed hardwood and softwoods/hardwoods vegetation types. Periodic harvests aimed at releasing crop trees, by removing poor quality competitors, will result in a healthier, more stable forest condition. These harvests will also generate revenues that could be used to rectify erosion problems, improve access and improve recreational and educational opportunities.

The hemlock which are present on this tract are infested with the Hemlock Woolly Adelgid. The Hemlock Woolly Adelgid is a small aphid-like insect that feeds on young Eastern Hemlock twigs during all seasons of the year with the greatest damage occurring during the spring. The loss of new shoots and needles seriously impairs the hemlock's health and vigor. The Adelgid is dispersed by wind, birds and mammals and is at the present time almost impossible to control in a forested environment. Cultural and chemical control methods have proven to work well in ornamental landscapes. Biological control agents such as the Asian ladybird coccinellid beetles show promise, but widespread availability and use is probably many years off.

Defoliation and resulting mortality can occur within several years after infestation. A recent study completed at the University of Connecticut has, however, determined that some hemlock appear to withstand long term exposure to adelgid infestation. In this study it was found that hemlock in valleys and on northwest through east slopes appear to be less susceptible to adelgid damage. These sites should be monitored regularly. The past practice of pre-emptive salvage harvesting at the first sign of infestation may be unwarranted. The presence of both the adelgid and hemlock elongate scale or hemlock looper has been shown to hasten decline symptoms especially when the hemlock are located on ridge tops and upper slopes. These areas should also be monitored regularly.

Infested hemlock die at different rates and deteriorate quickly after death. Although standing dead hemlock provide excellent foraging and cavity nesting habitat for many species of birds they do create problems. Dead hemlock trees not only pose a direct threat to property users if they are within striking distance of a trail, they also pose a long term wild fire hazard. Salvage harvests are feasible on this property if determined to be necessary, however timing is crucial if loss of timber value is to be minimized. Planting these areas with white pine and or Norway spruce seedlings would eventually re-establish the conifer component should the adelgid continue to cause hemlock mortality. If the hemlock are going to be salvaged then planting should be postponed until the first spring after the harvest. If no salvage harvest is implemented planting should occur the first spring after it appears that 50% or more of the hemlock will not survive. These seedlings should be planted at a 10'X10' to 20'X20' spacing or between 100 and 400 seedlings per acre. These seedlings may also need to be protected from deer browsing and competition from undesirable vegetation. White pine and Norway spruce seedlings are available from the State Nursery at cost.

All harvest operations must be implemented by forest practitioners certified by the State of Connecticut. They should also follow the guidelines set forth in the publication: **"TIMBER HARVESTING AND WATER QUALITY IN CONNECTICUT; A Practical Guide for Protecting Water Quality While Harvesting Forest Products** prepared by the Connecticut RC&D Forestry Committee, 1990.

Please see Appendix C for additional information on timber harvesting and the hemlock woolly adelgid.

More In-depth Information

A Public Service Forester from the Department of Environmental Protection may be contacted at (860) 295-9523 to provide more in-depth forest management and planning information. These services are provided free of charge. Services of a more intensive nature are available from the Town Forester or at a fee from Certified Professional

Foresters. A directory of Certified Forest Practitioners is available from the State of Connecticut Division of Forestry (860) 424-3630.

Figure 8

Forest Vegetation Map

April 14, 1998

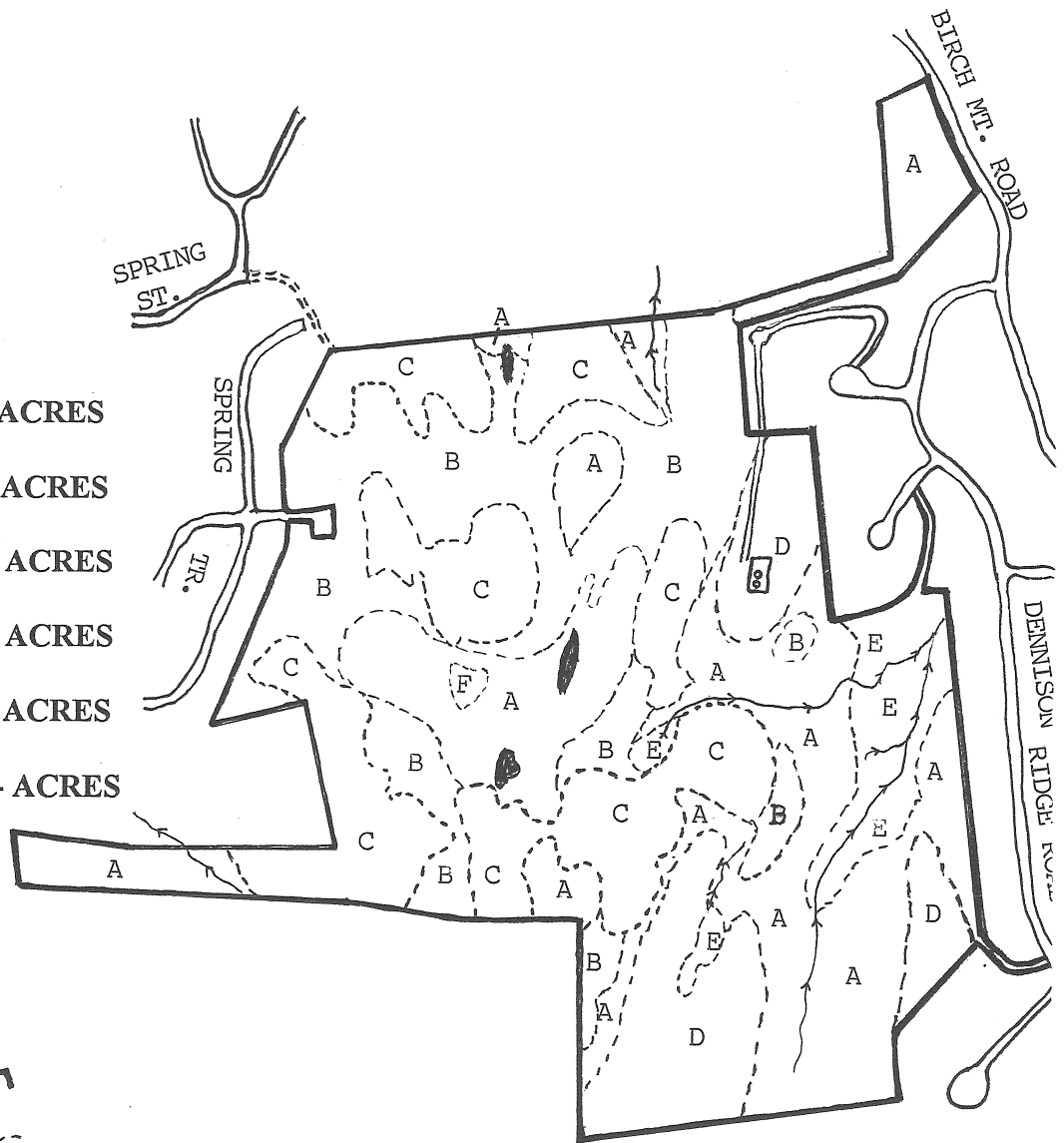
NORTH



SCALE 1"=1000'

VEGETATION TYPES

- A. Mixed Hardwoods.....73+- ACRES
- B. Softwoods-Hardwoods...60+- ACRES
- C. Hemlock.....60+- ACRES
- D. Oak Ridge.....32+- ACRES
- E. Hardwood Swamp.....16+- ACRES
- F. Open.....1+- ACRES



LEGEND

- PROPERTY BOUNDARY
- VEGETATION BOUNDARY
- PAVED ROAD
- STREAM
- VERNAL POOL (1+-ACRE)

State Parks Division Review

Case Mountain Open Space Area comprises a 243 acre town owned parcel located in the southeast corner of Manchester. It is an undeveloped forested area which contains 8 miles of an existing trail system. Within close proximity to this parcel is several hundred acres of open space owned by the Manchester Water Company, including various mountain peaks (Birch Mt. and Case Mt.) and reservoirs (Case Reservoir). The close proximity of this water supply property means that any activities on this town property may affect the watershed. At this time, there is very little formal access to the property mostly comprising small pull-offs on the side of both Birch Mt. Road and Spring Street. Access is via a limited right-of-way through private property, although there are many access points from private properties. There are trails which run south into the water company property, including the blue-blazed Shenipset trail which is maintained by the Connecticut Park and Forest Association. These trails link into a much larger trail system which is being utilized by hikers and mountain bikers at this time. Most of the existing uses of this property involve passive recreation such as hiking, biking, bird watching and picnicking. No motorized vehicles are allowed at this time. There are reports of illegal partying and other activities which may be an issue of concern. Conflicts regarding usage of the trails is another concern of the town. The usage of the area has begun to increase as more people discover this beautiful area and have begun to utilize it. A long-term management plan would be a critical tool for the Town to possess to address these issues and prevent any potential future conflicts.

Access is probably one of the first factors that the Town needs to consider. As this area begins to experience higher usage, there will be a greater demand for parking at the trail heads. The Town should consider acquiring one of the two private parcels adjoining the trail head off of Spring Street. On this parcel a formalized parking lot could be constructed which would allow for hikers and bikers to park their vehicles off of the street. This would be a safer situation and would also allow for police patrols to

monitor usage of the area. Any cars which are located in this parking lot after hours could be ticketed. This may help reduce the illegal night time activities which seem to be occurring at this time. By patrolling streets to prevent on street parking, police could force people to utilize only the provided access points. This would help control who and when the area was being used. This is also a key location for things like signage, posting of regulations and also as a spot for a volunteer who can greet people and give them verbal information as well as pass out brochures, maps of the area, etc.. The town may want to provide a gate across the entrance. This gate could remain open to avoid having to have staff open and close it daily. However, the gate is a good tool for police to use when they catch cars parked in the lot illegally at night. They can close and lock the gate forcing the trespassers to come to them! Some thought may also want to be given to sanitary facilities in the parking lot. By providing a porta-potty, problems with people using their own discretion with where to go can be avoided. This may mean having to maintain and service the facility, as well as risking vandalism, however it usually is a positive addition to any facility. Careful thought should be given to the garbage situation also. It usually creates more of a maintenance headache to provide trash barrels because not only does trash end up on the ground but people will bring trash from home to dispose of here and now the barrels have to be emptied. A carry-in/carry-out policy seems to work the best for State facilities. Barrels can be provided in the parking lot if the Town maintenance staff is willing to keep up with the situation. As with everything, there is a balance between providing adequate services and the potential for vandalism and high maintenance costs.

Education of users is going to be a key component of any long-term management plan that the Town may develop. This should include factors from educating users on trail etiquette to rules and regulations for the area to safety. Brochures which educate the public in regards to things like proper mountain bike techniques to prevent erosion and conflicts with other users, outdoor safety, and even just trail maps should be supplied to the public at various locations. This may mean at the Town hall or other key locations like bike shops, or at box/sign kiosks located in the parking lot and trail heads. Depending on the usage that the Town would like to encourage, various

advertising approaches can be used from posters around town, to brochures or flyers, to public meetings, to holding Trails Day events. All of these means can both educate and interest the public in this area. When the public has interest in an area, they tend to want to preserve and maintain the area because they recognize the value of the area for preservation and recreation. Education can be a key factor in reducing conflicts on multi-use trails.

Related to the education aspect, a great concept involves the introduction of an education loop trail. These educational trails can be an invaluable asset to a recreation area by promoting usage and educating users on proper trail use and to nature in general. Once again, the public will value the resource much more if they understand it. This area lends itself well to an educational trail, with points of interest revolving around the hemlocks, vernal pools and the interesting geology located here. There are two different ways to approach an educational loop trail. The first would be to place numbers on points of interest and then supply a booklet which details the pertinent information. (See Appendix D) The booklets would then need to be made available to the public somehow. This could be done in a box/sign in the parking lot or at the trail head. They could also be supplied at Town Hall, bike shops or other key locations. This method would be less susceptible to vandalism than the other means of designing the trail where educational signs are actually posted at each point of interest. This may also be cost prohibitive as signs need to be designed and created, and then maintained. While printing of the brochures may have some cost associated with it, there are typically various volunteer groups or schools that may be willing to create and print them. Another factor to consider would be that the educational trail can also be designed for use by mountain bikers. An educational trail would typically be accessible by hikers only. However, depending on the number of stops and the areas covered, there is no reason that bikes cannot also use the trail. Careful thought should be given to the number and location of stops. There could be a great benefit gained by educating mountain bikers as well as hikers to nature and trail etiquette. This could also factor in reducing conflicts between user groups.

While at this time there are no major conflicts between user groups, there is a strong potential for it to occur in the future as this area becomes more heavily used. It is a great compliment to the area that no conflicts occur at this time. The existing trails seem to be well laid out and designed. There doesn't seem to be any need to reroute or redirect any existing trails. Any potential erosion or problem areas can be addressed with various construction techniques such as a properly placed and constructed water bar. (See Appendix D). There are several criteria that should be met for a designated multi-use trail: 1) Trail surfaces should be such that erosion from the additional use will be minimal. 2) Trails should be closed to mountain bikes in wet weather or rainy seasons. 3) Signs should indicate multi-use trail, low speed or other potential hazards. 4) The trail should be wide enough to let mountain bikers and hikers pass each other safely and 5) There should be adequate visibility to avoid collision. By following these suggestions, almost all potential problems from mountain bikes can be avoided. The trails themselves limit the range of mountain bikers. Many routes are just too rugged, rocky or steep for a bike to travel. Hikers who wish to avoid bikes can use those trails.

Having separate trails for each user group is not advocated due to an increased impact on the environment due to having many more trails to provide an equal experience for both groups. Usually the "grass is greener" philosophy also exists as hikers will wonder what the biking trails are like and vice versa. Separate trails also are not a good idea in that it does not promote cooperation between the separate user groups. There is a bulletin put out for free by the U.S. Dept. Of Transportation (Report No. FHWA-PD-94-031) which details many multi-use conflicts, issues and potential solutions. (One copy has been given to the Manchester Conservation Commission). This may provide some helpful input for a long-term management plan, as well as the policy statement from DEP regarding their trail policy. Probably the very best approach is to work with various organizations like the New England Mountain Bike Association (NEMBA), the Connecticut Bicycle Coalition (CBC), Connecticut Park and Forest Association (CFPA), Dept. Of Environmental Protection (DEP) and other groups which all work on and for trails. It may be especially helpful to have NEMBA involved as they have experience with trail maintenance as well as volunteer bike patrols which would help with

supervising the area. (See Appendix D for the NEMBA brochure). This group has become very proactive in working with other user groups to reduce trail conflicts and reduce the impact of mountain bikes. They may also be willing to lead guided bike tours of the area which will help with the education of riders, as well as promoting the recreational potential of the area.

The Connecticut Bicycle Coalition and NEMBA were also instrumental in formulating a "Multi Use Recreational Safety and Management Plan" with the Metropolitan District Commission in West Hartford last year. This plan helped reduce liability fears that the MDC had regarding higher risk uses like mountain biking. The plan calls for the establishment of a volunteer mountain bike patrol which will advise and assist MDC recreational visitors and provide emergency first aid. It also requires that appropriate protective gear like helmets be worn, provides for NEMBA share the trail signage, establishes a committee for shared use recreation and other reinforcement of multi use messages. A similar plan may be created for this area if conflicts and liability remain a concern.

Overall, this seems to be a wonderful area with a lot of potential for recreational opportunities well into the future. With a little thought and foresight any potential problems can be avoided and a safe, fun place for people of all types and ages to enjoy can be created and maintained.

Archaeological Review

A review of the state of Connecticut Archaeological Site Files and Maps show no known archaeological resource in the project area. However, the project area possesses a moderate-to-high sensitivity for undiscovered archaeological sites associated with prehistoric native American encampments. The most sensitive areas are associated with 1) steep topographic slopes with outcroppings of bedrock which may produce a natural ledge formation and may have small rockshelter sites under the ledge area; and 2) small open campsites adjacent to wetland features throughout the preserve area. The high prominence of Birch Mountain may also yield below-ground cultural resources.

While no archaeological sites have ever been reported from Case Mountain the probability of locating prehistoric Indian camp sites associated with hunter-gathers moving throughout the area is relatively high. We do not expect large village settlements in the area, however, a series of campsites could yield important information on the logistical movements and subsistence patterns of aboriginal peoples in the Manchester-Glastonbury area. Along with topographic and environmental features that indicate the high probability of archaeological sites, the fact that the area has been maintained as open space suggests that sites will be undisturbed and possess a high degree of integrity.

The Office of State Archaeology does not necessarily recommend an archaeological survey for the project area. Hiking trails should have no adverse effect on any below-ground cultural resource. However, future plans may include educational or research programs in archaeology and Case Mountain would offer a potential outdoor laboratory of interest. The Office of State Archaeology is prepared to offer technical assistance to the Manchester Conservation Commission and any other party to conduct any public programs.

Appendix A

Soils Information

Call the ERT Office for Appendix Information at
860-345-3977

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, soil 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 region.

**The services of the Team are 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, landfills, commercial and industrial developments, sand and gravel excavations, 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 official 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 and the ERT Coordinator. A request form should be completely filled out and should include the required materials. 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 and request forms regarding the Environmental Review Team please contact the ERT Coordinator: 860-345-3977, Eastern Connecticut RC&D Area, P.O. Box 70, Haddam, Connecticut 06438.