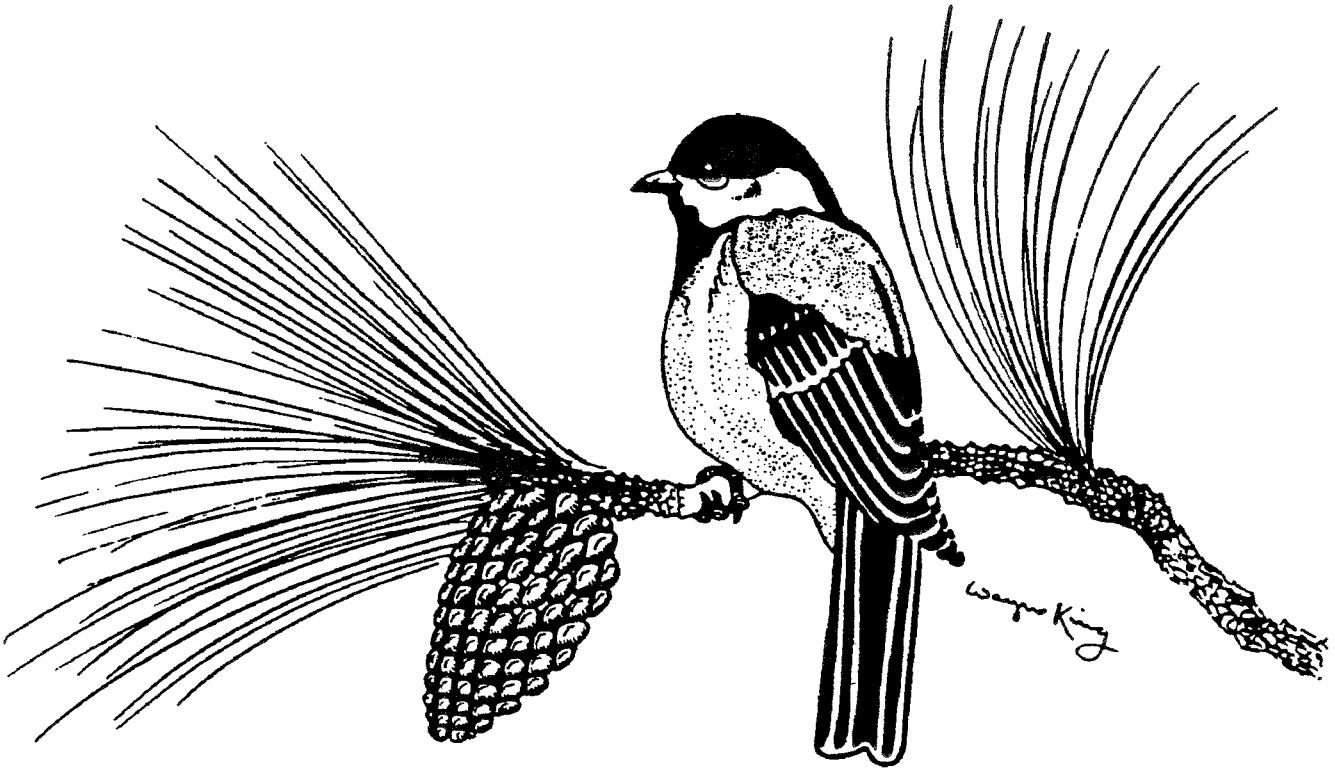
KING'S MARK ENVIRONMENTAL REVIEW TEAM



REPORT FOR

BEACON HILL

BRANFORD,
CONNECTICUT

King's Mark Resource Conservation and Development Area, Inc.

BEACON HILL

BRANFORD, CONNECTICUT

Environmental Review Team Report

Prepared by the King's Mark Environmental Review Team
of the King's Mark Resource Conservation
and Development Area, Inc.

Wallingford, Connecticut

for the

Department of Environmental Protection - Planning and Development Unit

and the

Town of Branford

This report is not meant to compete with private consultants by supplying site designs or detailed solutions to development problems. This report identifies the existing resource base and evaluates its significance to the proposed development and also suggests considerations that should be of concern. The results of the Team action are oriented toward the development of a better environmental quality and long-term economics of the land use. The opinions contained herein are those of the individual Team members and do not necessarily represent the views of any regulatory agency with which they may be employed.

SEPTEMBER 1990

ACKNOWLEDGMENTS

The King's Mark Environmental Review Team Coordinator, Nancy Ferlow, would like to thank and gratefully acknowledge the following Team members whose professionalism and expertise were invaluable to the completion of this study:

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Finally, special thanks to Pam Adams, DEP Planning and Development, Lauren Brown and Jeffrey Clark, Branford Land Trust, Monroe Hovey, Shore Line Trolley Museum and Judy Gott, Branford First Selectman for their cooperation and assistance during this environmental review.

EXECUTIVE SUMMARY

Introduction

The DEP Land Acquisition Program requested that an environmental review be conducted on Beacon Hill, a State/Town recreation area. The site is located in western Branford near the Farm River. The Shore Line Trolley Museum is located to the west. The site contains hardwood forest with several areas of tidal wetland. The hill provides a panoramic view of Long Island Sound and was used as a lighthouse site in Colonial times. Several developments were proposed for the site until the Town and the DEP purchased it for recreational use.

The review process consisted of 4 phases: 1) inventory of the site's natural resources; 2) assessment of the resources; 3) identification of resource problem areas; and 4) presentation of planning and land use guidelines. Based on the review process, specific resources, areas of concern, development limitations and development opportunities were identified.

Setting and Land Use

The 70 acre site is located in western Branford and is bounded by medium to high residential areas to the north, salt marsh to the south, east and west and the Shore Line Trolley Museum trolly tracks to the west and south. The site contains wooded land, remnants of a small quarry and ruins of a former swine farm. Development of passive recreation will require the removal of much of the waste material that has been dumped over the years.

Physiography, Climatic Conditions and Topography

Beacon Hill is located on the southern limits of a traprock ridge in the physiographic region known as the Connecticut Central Valley. It is located in the Western Coastal Ecoregion. Topography is controlled by the underlying bedrock. Like many traprock ridges, Beacon hill has a steep western slope and a gentler eastern slope. The maximum and minimum elevations are approximately 130 and 10 feet above mean sea level, respectively..

Geology

Bedrock underlying the site consists of the Holyoke Basalt, the East Berlin Formation and the Shuttle Meadow Formation. The Holyoke Basalt is the igneous rock that forms the traprock ridge. The East Berlin and Shuttle Meadow Formations are sedimentary rock. The Eastern Border Fault that separates the Central Valley and the Eastern Uplands is found just south of the site. Two smaller structural faults are found at the northern limits of the site. A discontinuous, thin blanket of glacial till covers the bedrock on the site. The texture of the till is loose and sandy. The southeast corner of the site contains post-glacial salt marsh deposits.

Recreation Potential from a Geological Perspective

Because of the steep slopes and shallow bedrock, the site has low potential for active recreational use such as playing fields. The site has high potential for passive recreational uses and environmental education programs. There are vantage points to view Long Island Sound, the New Haven skyline and the marshes of the Farm River. Access to the river may be possible for canoeing and kayaking. Picnic areas could be located on the crest of the hill. Hiking trails should avoid steep slopes because of potential erosion problems and danger to hikers. If sanitary facilities are desired, portable toilets could be used. Other options include a small on-site septic system or a tie-in to the municipal line. The traprock ridge with its unusual habitats, the salt marshes and the geology make this site valuable for environmental education.

Hydrology

The entire site eventually drains to the Farm River. Surface runoff from the western half of the site flows directly to the Farm River. Runoff from the eastern side flows to an unnamed tributary of the Farm River. Groundwater on the site is classified as GB/GA which means it is presently contaminated, and the State's goal is to upgrade it to GA. No streamcourses occur on the site, but there are seasonal drainage swales. Surface waters have not been classified and are considered to be Class A. The Farm River and its tributary are Class SB/SA which means the water is presently degraded, and the State's goal is to upgrade it to SA. There are no outstanding aquifers on the site. Bedrock is the likely source of water if water is needed. Due to the GB classification, hookup to the municipal water lines is recommended if a water supply is desired.

Soil Resources

The site is characterized by gently sloping to steep, well-drained to somewhat excessively drained soils. The area has a rough surface with bedrock outcrops, a few narrow intermittent drainageways and small wet depressions. Soil conditions which should be considered in planning at the site include stoniness, steep slopes, shallow to bedrock areas, drainageways and small wet depressions. These conditions require careful consideration for the location of trails, roads and other structures and for the implementation of conservation measures to prevent excessive runoff, erosion and siltation during their installation. Erosion control measures include the permanent vegetation of exposed slopes, diversions and water bars. Temporary measures such as silt basins and sediment barriers may be necessary to prevent soil erosion and sedimentation during construction and the period before permanent seedings have stabilized any disturbed slopes.

Biological Resources

Beacon Hill is the southernmost portion of a series of traprock ridges. Beacon Hill differs from the usual traprock ridge habitat because it contains a great number of exotic species and because of the die-back of oak trees from gypsy moths. Beacon Hill affords visitors an opportunity to view vegetation and wildlife in a fairly natural

state. The major use of this site should be for passive recreation, including hiking, picnicking and wildlife observation, which have minimum disturbance to the existing habitat. In addition, since Beacon Hill has such a high concentration of exotic plants, areas can be set aside for research on plant control through a variety of methods and natural regeneration of the site. Traprock ridges are considered critical habitat by the Natural Diversity Data Base. Traprock ridges can harbor an assemblage of rare and/or unique plant species and communities. Several of the State's endangered and threatened species appear to be restricted to these ridges. Beacon Hill, unfortunately, only has historic records of Connecticut "Species of Special Concern," including Prickly Pear found on a dry outcrop in 1852 and Indian Plantain found along the Farm River in 1899. Recommendations include using existing trails where possible to minimize additional impacts, clearing the vegetation from the vista points and developing an educational trail guide for visitors.

Threatened and Endangered Plant and Animal Species

According to the Natural Diversity Data Base, there are no known extant populations of Federally Endangered and Threatened species or Connecticut "Species of Special Concern" occurring at the site. Historic records show that 2 "Species of Special Concern," Indian Plantain and Prickly Pear, were in the general area. The general vicinity has been identified as a Natural Area Inventory site.

Archaeological Resources

The Beacon Hill area is rich in natural and cultural resources. Potential areas for historic archaeological sites include a kiln, the quarry and the early beacon site. There is a high potential for undisturbed pre-historic archaeological sites. The Town can seek matching funds to conduct a reconnaissance survey to locate the sites. If no funds are available, any land disturbance should be submitted for review. Passive recreational activities should have no effect on the archaeological resources.

Coastal Resource Planning Considerations

The site is characterized by a forested ridge rising above the Farm River and associated salt marsh. The ridge is classified as shorelands, the saltmarsh is classified as tidal wetlands and the lower portions of the slopes are classified as coastal flood hazard area. Passive recreational uses are consistent with surrounding land uses and could complement the Trolley Museum. A buffer between the residences and recreational activities should be considered. Recreational uses are also consistent with the Branford Plan of Development and the local zoning. The Connecticut Coastal Management Act (CCMA) contains standards to protect coastal resources. Development of the site should avoid any encroachment of the tidal wetlands. Coastal flood hazard areas should be developed to minimize risks to property. Passive recreation is particularly suitable, but all floatables should be located out of the flood area or be anchored and floodproofed. Shorelands are areas that can support development. Beacon Hill is characterized by steep topography which makes it less suitable for intensive development. The site is well-suited to passive recreation. Some water-dependent uses such as a small boat launch are possible, but the site is unsuitable for intensive water-dependent use. Natural vistas

and viewpoints should not be altered greatly. Minimal clearing is acceptable. Provided all development occurs on the uplands and setbacks and erosion and sediment controls are applied, there should be no adverse impacts to resources or water quality. Any sanitary facilities should be located out of the coastal flood hazard area or floodproofed.

Land Use Planning Considerations

The site is located in an R-4 zoning district which allows single family homes on 20,000 square feet. This zone also allows recreational facilities by special permit. The site is presently undeveloped with a rough network of trails.

Recreational Opportunities

The site is ideally suited for passive recreation. The Trolley Museum provides an excellent opportunity to integrate cultural and historic resources with natural resources. Stops on the trolley line could be developed at trail entry points. Parking could be provided at the museum, eliminating the need for a large parking area on the site. The Dominican Road access is restricted by the residential character of the neighborhood. Volunteers can perform trail work. Perhaps some arrangement could be made with the Boy Scouts to do trail work in exchange for camping, workshops and canoeing privileges. The Beacon Hill site provides an excellent link to Kelsey Island which provides camping for youth groups. One future recreation option includes linking the trails with the South Central Regional Authority trails around lake Saltonstall. Other natural areas in Branford are managed by a Commission. The Commission has a good working relationship with the Police, Public Works and Recreation Departments.

A primitive loop trail exists on the site. Volunteers will be needed to clear and mark the trails. A trail could start at the northern base of the western slope, run parallel to the tracks, ascend to the summit near the quarry, flatten out across the plateau and switchback to the entry point. Scenic vistas could be provided along the trail. An adjacent DEP parcel could be used for picnic areas and portable toilets. Group camping could be established near the former swine farm or in a clearing off of the trail. Other recreational uses include rock climbing and cross-country skiing. Activities which are not compatible with surrounding land uses include hunting and off-road vehicles.

Recreational Planning

Because of the generally rough topography and shallow to bedrock soils, the site's potential uses are limited. Basically, it should remain as natural open space, offering trails and overlook points. It could serve as the southernmost stretch of a north-south trail running the entire width of the State from Long Island Sound into Massachusetts on traprock ridges.

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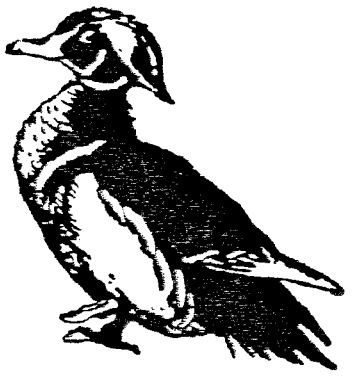


INTRODUCTION

The Department of Environmental Protection (DEP) Land Acquisition Program requested that an environmental review be conducted on Beacon Hill and environs, a State/Town recreation area. The site is located in western Branford near the Farm River. The Shore Line Trolley Museum is located to the west. Access is provided by Rose Hill Road and Dominican Road.

The site contains hardwood forest with several areas of tidal wetland. The hill provides a panoramic view of Long Island Sound and was used as a lighthouse site in Colonial times. Several developments were proposed for the site until the Town and the DEP purchased it for recreational use. Currently, there is no plan for the site.

The purpose of this review is to inventory and assess existing natural resources and discuss recreational opportunities, erosion and sediment control and the impacts of development. This environmental information will be used to assist the Town and the DEP in guiding conservation and recreation in this area. Specific objectives include:

1) Assess the hydrological and geological characteristics of the site, including geological development limitations and opportunities;

2) Determine the suitability of existing soils to support recreational development;

3) Discuss soil erosion and sedimentation concerns;

4) Assess the impact of recreation on the tidal resources; and

5) Assess planning and recreational issues.

THE ERT PROCESS

Through the efforts of the King's Mark ERT, this environmental review and report was prepared for the DEP and the Town. This report primarily provides a description of on-site natural resources and presents planning and land use guidelines. The review process consisted of 4 phases:

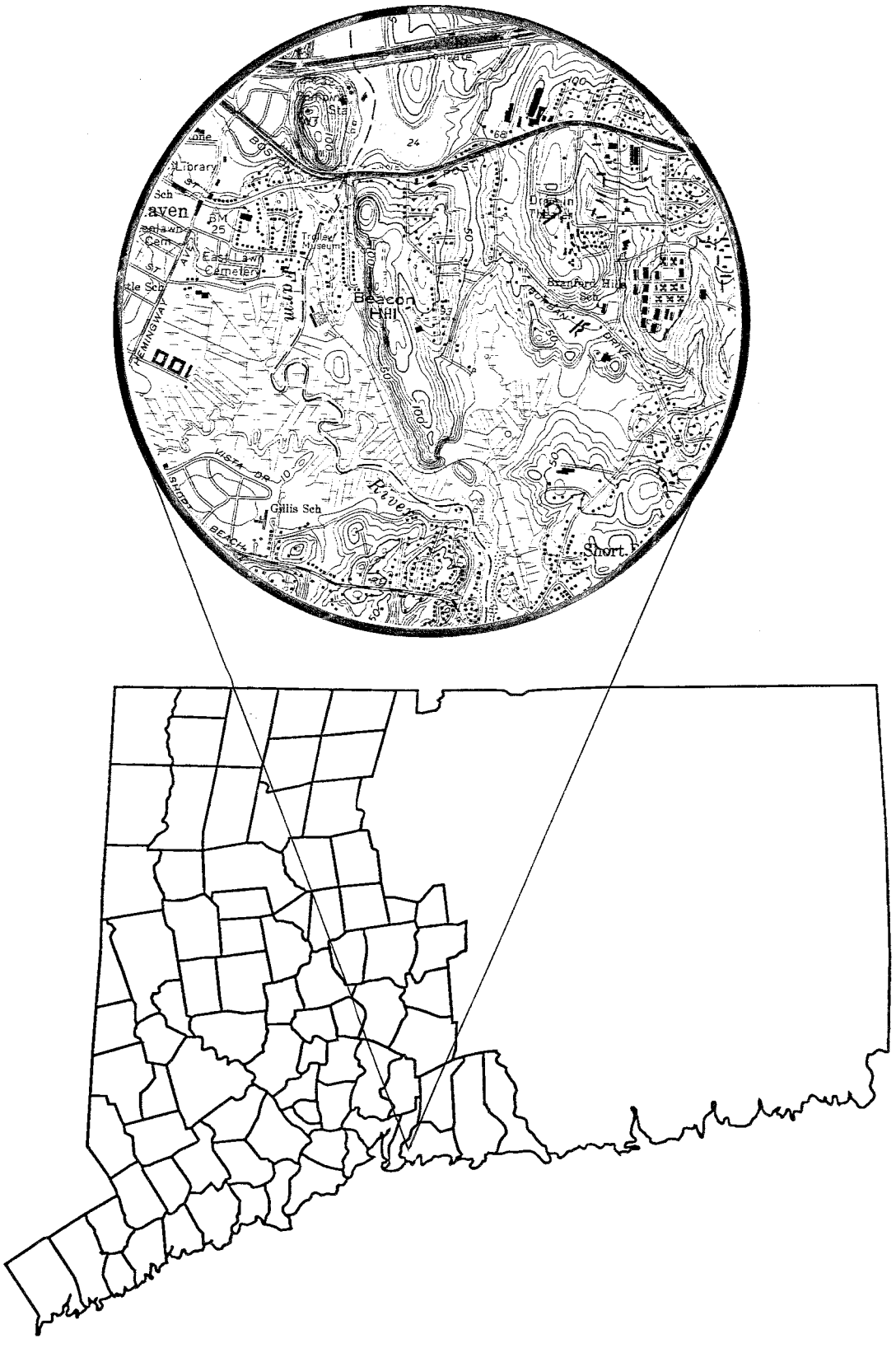
1) Inventory of the site's natural resources (collection of data);
2) Assessment of these resources (analysis of data);
3) Identification of resource problem areas; and
4) Presentation of planning and land use guidelines.

The data collection phase involved both literature and field research. The ERT field review took place on August 8, 1990. Field review and inspection of the site proved to be a most valuable component of this phase. The emphasis of the field review was on the exchange of ideas, concerns or alternatives. Mapped data or technical reports were also perused, and specific information concerning the site was collected. Being on-site also allowed Team members to check and confirm mapped information and identify other resources.

Once Team members had assimilated an adequate data base, they were able to analyze and interpret their findings. The results of this analysis enabled Team members to arrive at an informed assessment of the site's natural resource development opportunities and limitations. Team members then prepared and submitted their reports to the ERT Coordinator for compilation into the final ERT report.

Figure 1

LOCATION OF STUDY SITE



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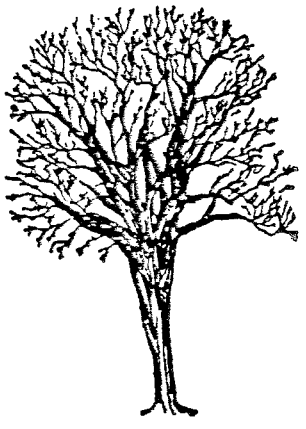

SETTING AND LAND USE

The site is approximately 70 acres in size and encompasses Beacon Hill, a traprock (basalt) ridge located in western Branford near the East Haven border. The site is bounded on the south and west by the Branford Electric Railway Association trolley tracks, on the east by Rose Hill Road, several residential properties and a commercial property and on the north by wooded, undeveloped land. Warfield and Dominican Roads, both residential cul-de-sacs, terminate near the site's northwest boundary. Access to the site appears feasible via Dominican Road, Rose Hill Road and the Shore Line Trolley Museum property.

Land use in the area includes medium to high density residential, which surrounds the northern half of the site. A provisions distribution center abuts the site on the east side. On the south, the site is surrounded mainly by salt marshes associated with the Farm River Estuary. Additionally, a segment of trolley tracks used by the Shore Line Trolley Museum bounds the west side of the site's southern half.

The site is characterized by mostly wooded land. Recently, there have been a few unsuccessful attempts to develop the site for residential purposes. A small quarry was worked on the site near its southern limits, and a swine farm was operated in the north central parts. Remnants of both activities are visible. Concrete foundation slabs occur in the area of the former swine farm. Unauthorized dumping of appliances, machinery, tires, clam shells and other waste material has taken place throughout the site.

Historical information, including age and ownership of the traprock quarry at the southern limits of the site, was not available. A 1934 air photo of the site and vicinity shows that the quarry was operating at that time. Based on research of traprock mining in Connecticut, the mining probably commenced during the late

1800s or early 1900s. Remains of the quarry operation include the quarry pit and vertical rock cliffs. Town officials noted that rusty machinery believed to have been used by the quarry operation may be found near the site, but were not observed during the field review. At least 5 cars have been junked in the quarry pit. Development of the parcel for passive recreational uses (i.e., hiking, bird watching, cross-country skiing) will probably require that cars and waste materials deposited in the vicinity of the former swine farm be removed for safety and aesthetic reasons. Every effort should be made to properly secure entrances to the site so that illegal dumpings do not continue.

PHYSIOGRAPHY, CLIMATIC CONDITIONS AND TOPOGRAPHY

The site is located in the physiographic region of Connecticut known as the Central Lowland or Valley, a north-south trending valley that extends from Long Island Sound to northern Massachusetts. Compared to the other 2 physiographic regions of Connecticut, the Eastern and Western Uplands, the Central Valley is characterized mainly by undulating terrain, except for 2 distinct belts of north-south trending ridges of resistant rock known as traprock that rise from the Valley floor. Beacon Hill is located at the southern limits of the major central ridge in the Valley, called Metacomet Ridge, near the boundary that separates the Central Valley from the Eastern Uplands.

According to the publication Rare and Endangered Species of Connecticut and Their Habitats (Dowhan and Craig 1976), the site is located in the Western Coastal ecoregion. The mean annual temperature of the region, including the site, is approximately 50.5° F. The average winter temperature is 31° F. The coldest month has a monthly mean minimum of approximately 23° F. The mean annual minimum temperature is 5° F. The average seasonal snowfall accumulation is

generally less than 30 inches, the lowest in the State. The frost-free season averages approximately 180 days. The average summer temperature is approximately 71° F. The warmest month has a mean maximum temperature of 83° F. Annual precipitation is approximately 43 inches.

Topography across the site is controlled principally by the underlying basalt bedrock (see Geology section). Bare to thinly covered bedrock characterizes the majority of the site. Like most of the traprock ridges in Connecticut's Central Valley, Beacon Hill is characterized by steep, west-facing cliffs and gently dipping, east facing slopes. The steepest slopes (15-35%) occur mainly on the west side of the site and in a few areas in the east central parts. Moderate slopes (8-15%) occur at the eastern limits, while the flattest slopes occur along the crest of Beacon Hill.

The former quarry operation left south facing, vertical cliffs at the southern limits of the site. The cliffs are approximately 80 feet high. At this vantage point, the site affords commanding views of coastal Branford and Long Island Sound. Scenic views of the New Haven skyline are available from the area of the former swine farm in the north central parts. Hazy conditions on the field review day and heavy vegetation prevented verification of this viewing corridor. Selective clearing of trees and brush in these areas would enhance the viewing corridors for hikers visiting the site.

Maximum and minimum elevations are approximately 130 feet above mean sea level and 10 feet above mean sea level, respectively (see Figure 2).

GEOLOGY

The site is located entirely within the Branford topographic quadrangle. A surficial geologic map (QR-14, R.F. Flint, 1960-62) for the quadrangle has been published by the Connecticut Geological and Natural History Survey. No bedrock

geologic map has been published to date. Preliminary bedrock geologic information is on file at the DEP Natural Resources Center in Hartford. John Rodger's Bedrock Geological Map of Connecticut (1985) was also referenced.

The principal rock type underlying the site is identified as Holyoke Basalt, an extrusive igneous rock (rock formed from molten material above the earth's crust) (see Figure 3). The rock is described as a fine-grained, dark gray, orange to brown weathering basalt, commonly referred to as traprock. It has a basic (opposed to acidic) mineral composition and is relatively low in silica, but rich in iron, magnesium or calcium-bearing minerals. When freshly exposed, basalt is commonly dark gray. However, when subjected to the weathering processes, its surface turns a reddish-brown. This is caused by the oxidation of iron and magnesium-bearing minerals in the rock. Because of its durability, basalt makes an excellent construction aggregate. It was quarried in open pit excavation at the southern limits of the site.

Bedrock underlying the areas east and west of Beacon Hill consists of sedimentary rocks (rocks formed by sediments near the earth's surface, generally in layers). These rock units are known as the East Berlin and Shuttle Meadow Formations, respectively. The East Berlin Formation rock consists of thinly bedded, medium gray to reddish-brown arkosic (i.e., feldspar rich) silty shales. The Shuttle Meadow Formation rock consists of reddish-brown silty shales. The sedimentary rocks are weaker and more susceptible to erosion than the igneous rocks, accounting for the sharp topographic contrast between the traprock ridges and the surrounding terrain in the Connecticut Central Valley.

Approximately 220 million years ago, Central Connecticut was located in a "rift valley." Tensional forces, thought to have been caused by the separation of the North American crustal plate from the European and African plates, produced major faults along the eastern margin of North America. The eastern margin of the


Figure 2
BEACON HILL
BRANFORD,
CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 800'
N
Topography
Information from USGS Topographic Map,
Branford Quadrangle


Figure 3
BEACON HILL
BRANFORD,
CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 800'
Bedrock Geology
East Berlin Formation
Holyoke Basalt
Shuttle Meadow Formation
Eastern Border Fault (approx.)
Information from USGS Topographic Map,
Branford Quadrangle
Old Stone
Library
East Lawn
Cemetery
Trolley
Museum
BM
25
Branford

Central Connecticut Valley slipped down along a line of faults, producing an escarpment at the edge of the eastern Connecticut Uplands. Rivers flowed into the valley from the uplands at the east and west, spreading conglomerate, sandstone and siltstone. Also, the 4 sedimentary deposits were covered by 3 volcanic events that spewed magma (subsequently becoming basalt) onto the sediments. From oldest to youngest, these deposits include the New Arkose (a sedimentary unit), the Talcott Basalt, the Shuttle Meadow Formation (a sedimentary unit), the Holyoke Basalt, the East Berlin Formation (a sedimentary unit), the Hampden Basalt and the Portland Arkose.

The entire sequence of sedimentary and volcanic deposition probably occurred in a span of approximately 20 million years, beginning in the Late Triassic Period and ending in the Early Jurassic Period (228 million years to 186 million years ago). During that time, the climate of the valley was semi-arid and warm. Dinosaurs roamed throughout the valley, leaving numerous footprints and an occasional bone in the sediments. The East Berlin Formation, which underlies the eastern limits of the site, is the same rock unit in which the famous trackway at Dinosaur State Park in Rocky Hill was discovered.

The "layer cake" of sedimentary and igneous rock is estimated to be approximately 11,000 feet thick. The Holyoke Basalt flow is estimated to range between 250 and 300 feet thick. The East Berlin and Shuttle Meadow Formations are believed to be approximately 500 feet and 300 feet thick, respectively. Sedimentary rock and lava flows in the rift valley were tilted from 10° to 30° generally toward the east and then eroded.

The Eastern Border Fault that separates the Central Valley and the Eastern Uplands is found south of the site. It is roughly aligned with the trolley tracks where they curve around the southern end of Beacon Hill. Looking southeast over the saltmarsh from the southern limits of the site, outcrops of metamorphic bedrock,

called Light House Gneiss, can be seen. The Light House Gneiss is indigenous to the Eastern Uplands and is described as a light pink or gray to red, medium-grained, well-foliated granitic gneiss. The metamorphic rocks which comprise the majority of the Eastern and Western Uplands are greatly different from igneous/sedimentary rocks that underlie the site. Near the site, the Eastern Border Fault trends in an east-west direction. Additionally, the Bedrock Geological Map of Connecticut (John Rodger, 1985) identified 2 east-west trending faults at the northern limits of the site that formed while the valley rifted. These faults are structural features that formed during the geologic past and are presently inactive.

A discontinuous, generally thin blanket (<20 inches) of till overlies bedrock on the site (see Figure 4). Till, which was deposited directly from glacier ice more than 12,000 years ago, is a non-sorted and generally structureless mixture of clay, silt, sand, gravel and boulders. The texture of the till on the site is generally sandy and loose.

A close look at the outcrop area within the parcel may reveal glacial striations left by the ice as it advanced through the region. These linear grooves were incorporated into the bedrock surface by the rock debris embodied in the glacier ice.

The southeast corner of the site contains post-glacial sediments called salt marsh deposits. These deposits consist of silt, sand and clay mixed with organic matter in poorly drained tidal areas.

(**NOTE**: For additional geologic, ecologic and biologic information, refer to the publication West Rock to the Barndoor Hills - The Traprock Ridges of Connecticut (Cara Lee, 1985). This publication is available at the DEP Natural Resources Center in Hartford.)

Figure 4
BEACON HILL
BRANFORD, CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 800'
N
Surficial Geology
Glacial till
Areas where bedrock is at or near the ground surface
Salt Marsh
Information from USGS Topographic Map, Branford Quadrangle
Old Stone Ch
Library
Trolley Museum
East Lawn Cemetery
BM 25
Boston Post Lane
Branford

RECREATION POTENTIAL FROM A GEOLOGICAL PERSPECTIVE

Because of steep slopes and shallow to bedrock conditions, the site has low potential for active recreational uses such as playing fields. Except for the crest of Beacon Hill, the majority of the site is characterized by slopes and subsurface conditions which will require extensive site work for the construction of playing fields. Additionally, shallow to bedrock conditions may be an obstacle for the development of playing fields in the relatively level areas along the crest of the hill. Cuts which require blasting and the placement of fill will significantly raise the cost of constructing playing fields in this area. Also, because the flatter areas are located in the interior parts of the site, playing fields would be a considerable distance from access points. An access road or drive to the area via Rose Hill Road or Dominican Road must overcome the moderate to very steep, bedrock-controlled slopes on the site.

The site has high potential for passive recreational uses such as hiking, bird watching and picnicking and for environmental education programs. Much of the site's appeal lies in the opportunity to create several vantage points that can afford panoramic vistas of Long Island Sound or the New Haven Skyline from the crest of Beacon Hill. At the lower vantage points, mainly at the site's southern limits, visitors can view the Farm River Estuary and salt marshes. Access to the river for canoes or kayaks may be possible at the site's southern limits.

The geology of the site should pose no major problems for passive recreational development, except for hiking tails constructed on the steeper slopes. Hiking trails on the steeper slopes may be too rigorous for some hikers. Also, regular maintenance will probably be required on the steeper slopes to ensure that the trails do not erode or become dangerous for hikers. Picnic areas could be located on the crest of Beacon Hill.

If sanitary facilities are desired, portable toilets could be used. Alternatives include a small on-site disposal system or connection to municipal utilities for the construction of permanent sanitary facilities.

In addition to its passive recreational attributes, the site has an equally high value for educational programs and research. The traprock ridge which may support unusual biologic communities and habitats, the nearby salt marshes and the geology make this site very valuable from an educational standpoint. Additionally, the historic aspects (e.g., the beacon point, traprock quarry and trolley transportation) could be tied into an educational program.

HYDROLOGY

The entire site drains entirely to the Farm River (see Figure 5). South of the site, the Farm River becomes the East Haven River. Runoff on the east side of the site flows generally to a short, unnamed Farm River tributary. Surface runoff that emanates on the west side of Beacon Hill flows downslope to the river, but is interrupted by the trolley tracks. In at least 2 places, runoff emanating from the west side of Beacon Hill is piped under the trolley tracks and routed to the Farm River. At its point of outflow to Long Island Sound near Momauguin Beach, the Farm River/East Haven River system drains an area of 26.6 square miles or 17,024 acres.

Groundwater within the site is classified as GB/GA. This means that groundwater in the area is presently contaminated (GB), but the State's goal is to upgrade it to a GA classification. Class GA water is presumed suitable for direct human consumption.

No major streamcourses occur on the site. However, there are seasonally wet areas (i.e., wetlands) and/or drainage swales along the east side and southern limits of the site. Also, seasonal seeps develop on the east flank of Beacon Hill. Surface


Figure 5
Portion of the site that drains to the unnamed Farm River/ East Haven River tributary
Portion of the site that drains directly to the Farm River/ East Haven River
Farm River/East Haven River
Unnamed tributary
BEACON HILL
BRANFORD, CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 800'
N
Watershed Hydrology
Information from USGS Topographic Map, Branford Quadrangle
Old Stone Ch
Library
East Lawn Cemetery
Trolley Museum
BM 25
Farm River
Farm River
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waters within the site have not been classified to date and are considered Class A water resources by default. Class A water resources may be suitable for drinking water supply, swimming and fishing.

The Farm River/East Haven River and its short, unnamed tributary on the southeast are Class SB/SA streamcourses. This means that the watercourses are currently SB, and the State's long-term goal is to upgrade them to Class SA. (The letter "S" in the streamcourse classifications means the water is saline.) A Class SB water resource indicates that water quality is currently known or inferred to be degraded. Class SB/SA water resources are generally suitable for recreational, agricultural or certain industrial uses such as processing or cooling water.

There are no outstanding aquifers on the site. Bedrock is the most logical source of groundwater on the site. Bedrock is usually capable of supplying small but reliable yields of water to individual wells. However, due to the present groundwater classification GB/GA for the site and vicinity, extension of municipal water lines to the site is recommended, if a water supply source is needed.

SOIL RESOURCES

The site is generally characterized by gently sloping to steep, well-drained to somewhat excessively drained soils that are found on uplands where relief is affected by the underlying bedrock. The area has a rough surface with bedrock outcrops, a few narrow intermittent drainageways and small wet depressions.

The Soil Survey of New Haven County, Connecticut (USDA-SCS, 1976) shows the sideslopes on Beacon Hill are mapped as a Holyoke-Cheshire complex with 15-35% slopes and the top of the hill is mapped as a Cheshire-Holyoke complex with 3-15% slopes (see Figure 6 and Tables 1 and 2 of Appendix A). A band of Ludlow silt loam with 3-8% slopes is found near Rose Hill Road to the northeast of Beacon Hill.

East/southeast, there is an area of Wethersfield loam with 15-25% slopes, grading into an area of Branford silt loam.

Unique soil conditions which should be considered in planning at the site include stoniness, steep slopes, shallow to bedrock areas and the presence of drainageways and small wet depressions. These conditions require careful consideration for the location of trails, roads and other structures and for the implementation of conservation measures to prevent excessive runoff, erosion and siltation during their installation. Erosion control measures include the permanent vegetation of exposed slopes, diversions and water bars. Temporary measures such as silt basins and sediment barriers may be necessary to prevent soil erosion and sedimentation during construction and the period before permanent seedings have stabilized any disturbed slopes.

In developing playgrounds, picnic areas and/or trails, soil properties that influence trafficability and erodibility must be considered. These properties include:

1) Stoniness;
2) Slope;
3) Ability to absorb rainfall readily;
4) Ability to remain firm to heavy foot traffic and not be dusty when dry (silty soils tend to be dusty when they are dried);
5) Texture of the surface layer;
6) Wetness;
7) Permeability;
8) Flooding; and
9) Erodibility.

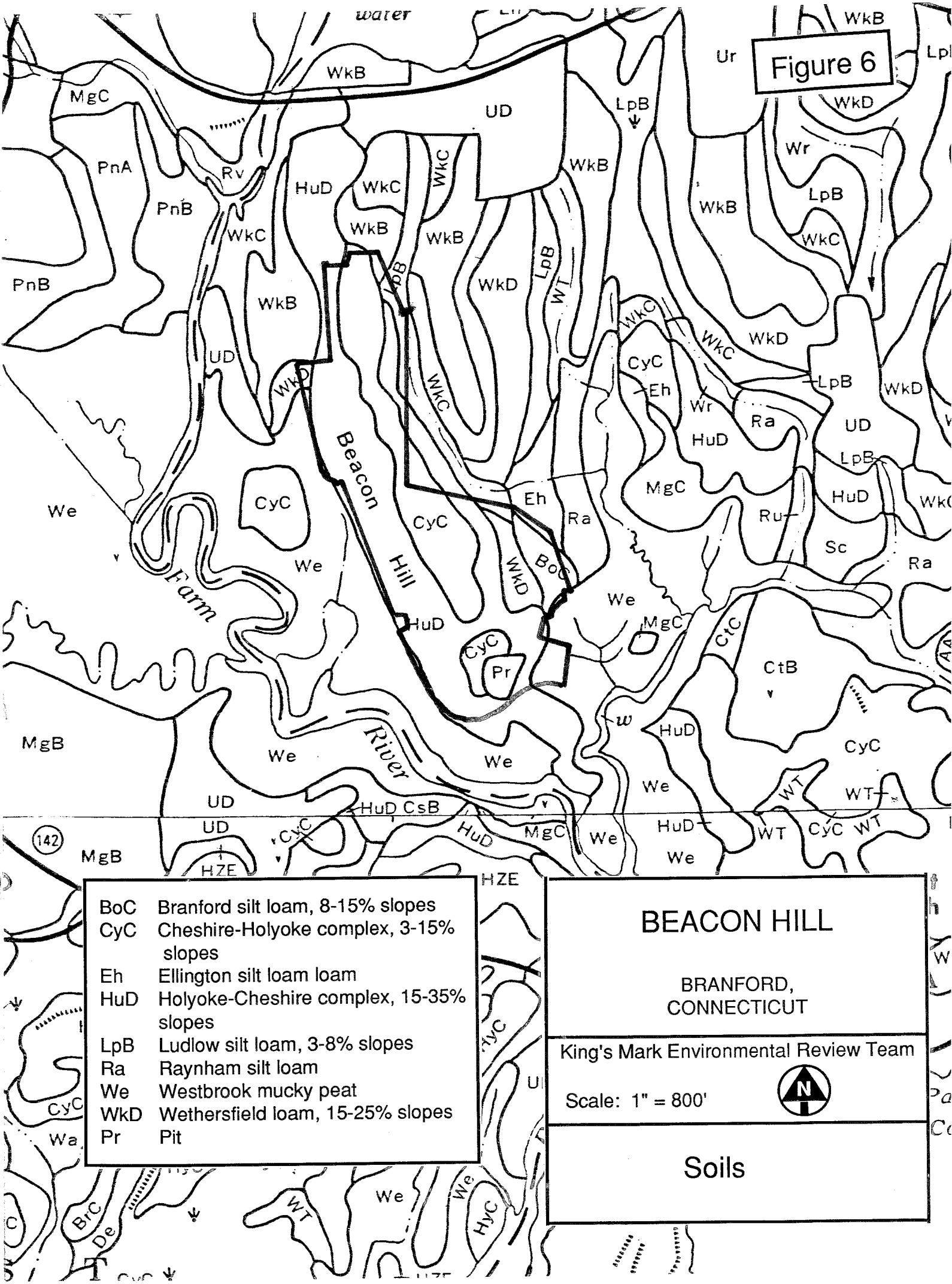


Figure 6
BEACON HILL
BRANFORD, CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 800'
N
Soils
BoC Branford silt loam, 8-15% slopes
CyC Cheshire-Holyoke complex, 3-15% slopes
Eh Ellington silt loam loam
HuD Holyoke-Cheshire complex, 15-35% slopes
LpB Ludlow silt loam, 3-8% slopes
Ra Raynham silt loam
We Westbrook mucky peat
WkD Wethersfield loam, 15-25% slopes
Pr Pit
Beacon Hill
Farm
River
142

Design and implementation of a particular land use should include:

1) Existing vegetative cover and desirable land features should be conserved as much as possible.

2) Provisions should be made for the removal of surface water, and measures should be implemented which prevent soil erosion.

3) Seeding recommendations (i.e., rates and dates) for disturbed areas requiring permanent vegetative cover should be included in the erosion and sediment control section of any plan.

4) Noxious and undesirable plants should be properly handled.

Soil Descriptions

BoC - Branford silt loam, 8-15% slopes: This sloping, well-drained soil is found on outwash terraces of stream valleys. This soil formed in a loamy mantle over sand and gravel derived mainly from sandstone, conglomerate, shale, arkose and basalt. Permeability is moderate or moderately rapid in the surface layer and subsoil and rapid or very rapid in the substratum. The soil has a moderate available water capacity. Runoff is rapid. This is a highly erodible soil. A highly erodible soil has a maximum potential for erosion that equals or exceeds 8 times the tolerable erosion rate.

CyC - Cheshire-Holyoke complex, 3-15% slopes: This soil complex consists of gently sloping and sloping, well-drained soils found on uplands. The Cheshire and Holyoke soils are so intermingled on the landscape that it is impractical to separate them in mapping. The Cheshire series formed in glacial till derived mainly from sandstone, conglomerate, shale and some basalt. The Cheshire soils are on broad hilltops, ridgetops and side slopes. The Cheshire soil has moderate permeability and a high available water capacity. Runoff is rapid. The Holyoke series formed in a mantle of glacial till derived mainly from sandstone, conglomerate, shale and basalt. The Holyoke soils are found on hills, ridges and knolls of bedrock-controlled glacial till plains. The Holyoke soil has a moderate permeability above the bedrock and a low available water capacity. Runoff is rapid. This is not a highly erodible soil.

Eh - Ellington silt loam: This is a nearly level, moderately well-drained soil found in slight depressions on broad outwash terraces of narrow stream valleys. This soil formed in a loamy mantle over outwash sand and gravel derived mainly from sandstone, conglomerate, shale, arkose and basalt. Permeability is moderate in the surface layer and subsoil and rapid or very rapid in the substratum. This is not a highly erodible soil.

HuD - Holyoke-Cheshire complex, 15-35% slopes: This complex consists of moderately steep and steep, well-drained and somewhat excessively drained soils found on uplands where the relief is affected by the underlying bedrock. The Holyoke and Cheshire soils are so intermingled on the landscape that it is impractical to separate them in mapping. The Holyoke series formed in a mantle of glacial till

derived mainly from sandstone, conglomerate, shale and basalt. The Holyoke soils are found on hills, ridges and knolls of bedrock-controlled glacial till plains. The Holyoke soil has a moderate permeability above the bedrock and a low available water capacity. Runoff is rapid. The Cheshire series formed in glacial till derived mainly from sandstone, conglomerate, shale and some basalt. The Cheshire soils are found on broad hilltops, ridgetops and side slopes. The Cheshire soil has moderate permeability and a high available water capacity. Runoff is rapid. This is not a highly erodible soil.

LpB - Ludlow silt loam, 3-8% slopes: This gently sloping, moderately well-drained soil is found on the top of broad drumlins, in slight depressions and near the base of drumlins and ridges of glacial uplands. Permeability is moderate in the surface layer and subsoil and is slow or very slow in the substratum. The available water capacity is moderate. Runoff is moderate. This is a potentially highly erodible soil.

Ra - Raynham silt loam: This soil is nearly level and poorly drained. It is found in depressional areas of broad glacial lake and outwash terraces. This soil formed in a mantle of coarse silt and very fine sand derived mainly from gneiss, schist, sandstone, conglomerate and shale. Permeability is moderate or moderately slow in the surface layer and subsoil and slow in the substratum. This soil has a high available water capacity. Runoff is slow. This is not a highly erodible soil.

We - Westbrook mucky peat: This nearly level, very poorly drained organic soil is found in tidal marshes along the coast of Long Island Sound. This soil formed in partly decomposed organic material from salt-tolerant herbaceous plants over loamy sediments derived mainly from gneiss and schist. This soil has moderate to rapid permeability in the organic layers and moderate permeability in the substratum. The available water capacity is high. Runoff is very slow. This is not a highly erodible soil.

WkD - Wethersfield loam, 15-25% slopes: This moderately steep, well-drained soil is found on the sides of drumlins, hills and ridges on glacial uplands. This soil formed in compact glacial till derived mainly from reddish-colored sandstone, conglomerate, arkose, shale and some basalt. Permeability is moderate in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is rapid. This is a highly erodible soil.

Pr - Pit: There is a small abandoned quarry at the southern end of Beacon Hill, consisting of a steep rock cliff and a wet depression surrounded by talus at its base. Any proposed land use should be based on an on-site investigation and evaluation.

BIOLOGICAL RESOURCES

BIOLOGICAL RESOURCES

General Habitat Description

Beacon Hill is the southernmost of a series of north-trending elongate hills forming an almost continuous spine through central Connecticut from Long Island Sound north into Massachusetts. These ridges have a distinct geologic history which contributes to their pattern of vegetation, soils and ecological habitats. A typical cross-section from east to west is described below (see Figure 7).

In general, at the base of the eastern slope is a wetland paralleling the slope, enriched by water seeping downslope over the nutrient-rich basalt. This wetland is dominated primarily by Red Maple and Green Ash with a dense shrub layer of Spicebush and a rich, diverse herbaceous layer of Skunk Cabbage, Sensitive Fern and numerous other species. Rising upslope, the wetland vegetation transgresses into a rich upland forest of Sugar Maple, White Ash and Tulip Poplar, with a Spicebush shrub layer and numerous spring ephemerals such as Bloodroot, Red Trillium, Wild Ginger, Jack-in-the-Pulpit and many others. Higher up, the slope gets drier, and this rich maple/ash forest changes into an oak-dominated forest which continues up to the summit. The moist mid-slope usually has a shrub layer dominated by Maple-leaved Viburnum, while the drier upper slope has a dwarf shrub layer of Low-bush Blueberries and/or Black Huckleberry. In some areas on this site, Eastern Hemlock is the predominant forest tree, with the continuous shade excluding many other plants. On the summit, especially in areas where bedrock is close to the surface, White Ash and Hickories predominate, and in areas with very shallow soil or exposed bedrock, only shrubs and/or small trees occur, including Eastern Red Cedar, Scrub Oak, Bush Honeysuckle and numerous spring and fall herbs. To the west of the summit is often a precipitous cliff face, generally devoid of vegetation except for a few tenacious ferns with a deposit of rubble or talus accumulated below.

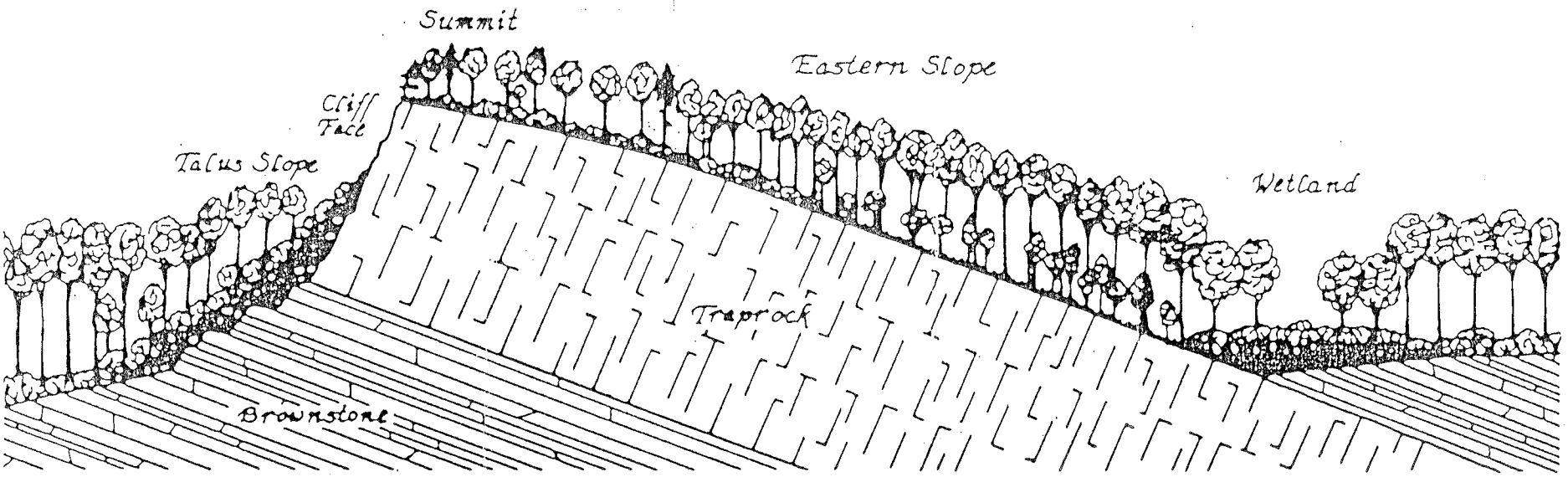
Below the talus, an oak or maple/ash forest occurs, depending upon soil depth and available moisture and nutrients.

In contrast to this typical description, Beacon Hill is highly overrun with exotic species, especially Black Swallowwort (*Vincetoxicum nigrum*), Wineberry (*Rubus phoenicolasius*), and other brambles (*Rubus* spp.). The abundance of these plants mask the overall vegetation on-site, and along with the die-back of the oaks by gypsy moth damage, Beacon Hill appears to be tangled with vegetation atypical of similar sites in Connecticut. Beacon Hill affords visitors an opportunity to view vegetation and wildlife in a fairly natural state. Spring ephemerals are abundant and diverse, and bird-life is active throughout the ridge and adjacent salt marshes. The major use of this site should be for passive recreation, including hiking, picnicking and wildlife observation, which have minimum disturbance to the existing habitat. In addition, since Beacon Hill has such a high concentration of exotic plants, areas can be set aside for research on plant control through a variety of methods and natural regeneration of the site. These factors should be included in any management plan developed in cooperation with the DEP and the Town.

Critical Habitats

Traprock ridges are considered critical habitat by the Natural Diversity Data Base. Critical habitats are defined as the entire spatial environment or portion thereof which may contain those constituent elements necessary for the needs and survival of "Species of Special Concern" in Connecticut. Traprock ridges can harbor an assemblage of rare and/or unique plant species and communities. Several of the State's endangered and threatened species appear to be restricted to these ridges, although some of these species occur on marble ridges in western Connecticut as well. These "Species of Special Concern" include a number of ferns and grasses which occur on the summits and cliff faces, and many talus slopes support an extremely rich and diverse flora of unusual plants. Cliff-nesting birds such as the

Figure 7



cross section of a traprock ridge

BEACON HILL

BRANFORD,
CONNECTICUT

King's Mark Environmental Review Team

Not to scale

Cross Section of a Traprock Ridge

Peregrine Falcon once inhabited these ridges, and wide-ranging mammals may currently roam them with little fear of human disturbance. Northern Copperheads and many other snakes are common on these ridges and slopes. Some ridges are well known for their butterfly concentrations, including many rare species. Beacon Hill, unfortunately, only has historic records of Connecticut "Species of Special Concern," including Prickly Pear (*Opuntia compressa*) found on a dry outcrop in 1852 and Indian Plantain (*Cacalia snaveleons*) found along the Farm River in 1899. Because the Prickly Pear has been extensively looked for on-site and the habitat has subsequently changed over time, this species has probably been extirpated from this site.

Recommendations

1) Utilize existing trails whenever possible to minimize additional impact to the site. In steep areas, rock steps, water bars, etc. should be placed in the trail to minimize erosion.

2) Scenic overlooks should be minimally cleared of vegetation. In the vicinity of the old quarry, a fence should be placed at the top of the cliff to minimize dangerous situations, and benches could be provided for tired hikers.

3) A brochure or trail guide should be developed to educate visitors of the biologic, geologic and historic aspects of the site, including a description of the vegetation and key to some of the common plants. This can be tied-in to viewing stations for educational purposes.

4) On the western slope, a sedge (*Carex squarrosa*) was found along the trail on the moist lower slope. This species is fairly rare in Connecticut and southern New England, although not currently listed as a "Species of Special Concern" by the DEP. This area should be searched for additional occurrences of this plant, and the trail system should be established to avoid impact to this plant.

THREATENED AND ENDANGERED PLANT AND ANIMAL SPECIES

According to Natural Diversity Data Base maps and files, there are no known extant populations of Federally Endangered and Threatened species or Connecticut "Species of Special Concern" occurring at the site.

The general vicinity has been identified as a Natural Area Inventory site (see Figure 8). In 1972, the Connecticut Forest and Park Association, Inc. prepared a Natural Area Inventory which included 459 sites. These were nominated as significant sites for one or more of the following attributes: geologic, hydrologic, biologic, archaeologic, cultural, aesthetic, research/educational. Being listed as a Natural Areas Inventory site does not impart any restrictions or provide legal protection. However, it identifies areas that should receive consideration before any proposed development is approved.

The following is taken from the original 1972 file:

> "A beautiful salt marsh in Branford and East Haven bordered by immature forest, agricultural land, freshwater swamp and a fine mature forest. The Triassic border fault is readily visible at the south end of Beacon Hill where it separates that basalt ridge from Precambrian granite to the south and east. The promontory of Beacon Hill offers extraordinary views of the salt marsh, Long Island Sound and Long Island. These views are further enhanced by the variety of land use in the area. Additional items of interest include two natural springs and the Branford Trolley Museum which offers rides along the base of the hill in antique trolleys. Thousands of persons enjoy the view along this route each year."

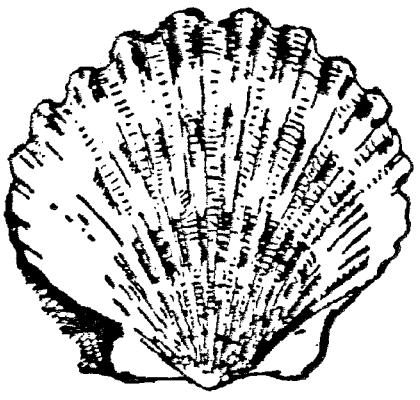
Additionally, Appendix B includes a copy of a 1982 letter from the site file.

Historical records show that 2 "Species of Special Concern" were reported from the general area. They are Indian Plantain (*Cacalia snaveleons*) and Prickly Pear (*Opuntia compressa*). Indian Plantain grows on river banks and moist low ground. Prickly Pear grows on rocks, sand dunes or sandy prairies.


Figure 8
BEACON HILL
BRANFORD,
CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 800'
Natural Area Inventory Site
Natural Area Inventory Site
Information from USGS Topographic Map,
Branford Quadrangle
Library
East Lawn
Cemetery
Trolley
Museum
Beacon
Hill
BM
25
24
River

Natural Diversity Data Base information includes all information regarding critical biologic resources available at the time of the request. This information is a compilation of data collected over the years by the Natural Resources Center's Geologic 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. Consultation with the Data Base should not be substituted for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of and locations of habitats of concern, as well as enhance existing data. New information is incorporated into the Data Base as it becomes available.

ARCHAEOLOGICAL RESOURCES



ARCHAEOLOGICAL RESOURCES

The history and archaeology of the general Beacon Hill area indicates the importance of the hill as a natural and cultural resource for the Town. These resources include the Branford Electric Railway Shore Line Trolley Museum which is listed on the National Register of Historic Places and the Waldo-Hennessy pre-historic archaeological site consisting of settlement and shell midden features dating to 3,000 years ago. In addition, the potential for historic archaeological resources includes a stone and brick kiln, the traprock quarry site and the possibility of remnants of the hill's use as an early beacon site. These historic sites could be studied and evaluated as objectives for the Town. Due to Beacon Hill's prominent vistas and adjacent marsh lands, coastline and rivers which offered pre-historic hunters/gatherers a diversity of natural resources to exploit, there is a high potential for presently undiscovered archaeological sites in the area.

The Town of Branford can seek matching grant funds to conduct an archaeological reconnaissance survey of the property to locate and identify all undiscovered sites. This will provide the best inventory of archaeological resources to assist in managing and protecting these sites for future generations of Branford residents. In addition, knowledge of archaeological and historical resources can be an important educational tool for the Town's students to learn from field experience concerning the Indian and European occupation of the Beacon Hill area.

If no funding is available to conduct an archaeological survey, the Office of State Archaeology highly recommends that any proposed land use plan for the property which involves any subsurface disturbance be submitted for review. The area can be tested before construction to ensure that archaeological sites are not encountered. However, passive recreational use of the land such as picnic areas and trails should have no effect on below ground resources.

Any archaeological sites located on the property will come under the protection of State legislation which requires anyone excavating on State property to have a permit from the Office of State Archaeology and the Connecticut Historical Commission. State laws also provide penalties for vandalizing and purposely destroying an archaeological site. The DEP and the Town of Branford should become familiar with this legislation (Public Act 89-368). The Office of State Archaeology is available to offer technical assistance in identifying and preserving cultural resources.

LAND USE AND PLANNING CONSIDERATIONS

COASTAL RESOURCE PLANNING CONSIDERATIONS

General Site Characteristics

The site contains approximately 70 acres and is characterized by a forested ridge rising above the Farm River and its associated tidal wetlands system. Most of the ridge area is classified as shorelands, as defined by section 22a-93(7) (M) of the Connecticut Coastal Management Act (CCMA). Tidal wetlands abut the southern and western portion of the ridge. The extreme lower portions of the slopes (areas below elevation 12 NGVD) are within the coastal flood hazard area.

Surrounding Land Use

To the southeast, south and west of the site are tidal wetlands, fragile coastal resources protected from significant disturbance by State statutes. On the western side of the site is the Shore Line Trolley Museum with a functioning track that follows the western and southern toe of the slope at Beacon Hill, then curves south towards the Village of Short Beach. The tracks separate Beacon Hill from the tidal wetland on the west and south. On the southeast, the toe of the Beacon Hill slope extends uninterrupted to tidal wetlands. North of the tidal wetlands, on the east side of Beacon Hill is a farm. On the northeast and north side of the site is a residential area that consists primarily of single-family homes with a large condominium complex to the north.

Passive recreational uses, if carefully planned, appear consistent with the adjoining land uses and could complement the Trolley Museum. When planning recreational uses adjacent to residential properties, it is generally advisable to preserve a buffer area between the residences and the recreational activities. On this large site, a buffer could be easily incorporated into the final site design.

Consistency with Local Planning

The Town of Branford developed a local Municipal Coastal Program that was adopted in 1983 as an addendum to the Plan of Development. At that time, it was generally assumed that the site would be developed in a residential manner. The plan recommends that public access be provided in any development proposal to allow public enjoyment of the outstanding scenic vistas and views of the Farm River system and Long Island Sound. It also recommends that the steep slopes and wetlands not be developed, but rather be preserved as open space. The intent to develop the site for passive recreation is fully consistent with these recommendations.

Consistency with Local Zoning

The entire site and surrounding area is zoned R-4 with a minimum lot size of 20,000 square feet. The primary use permitted is residential, with associated home offices, home occupations, farm stands and Town facilities and uses also allowed as of right. There are several uses permitted by special exception, including commercial kennels and State facilities and uses. Because it would be a State facility, the proposed passive recreational use is consistent with the current zoning. Because of the joint State and local effort to acquire and develop the site, it is unclear what zoning approvals, if any will be required. For further information contact Branford's Town Planner, Shirley Rasmussen at 488-1255.

Consistency with the Connecticut Coastal Management Act

The CCMA contains standards and criteria relevant to the protection of coastal resources and land and water uses in the coastal boundary. It also requires that specific adverse impacts be minimized. Any development (except for specific minor activities exempted by State and local regulations) within the coastal boundary as defined by Connecticut General Statutes (CGS) Section 22a-94 must be consistent with all applicable standards and criteria of the CCMA, and potential statutorily-

defined adverse impacts must be acceptable. This applies to private, municipal, state and federal projects.

Appendix C contains a complete listing of the CCMA policies and potential adverse impacts that may apply to development of the site.

Consistency with Applicable Resource Policies

The coastal resources on and adjacent to the site are tidal wetlands, coastal flood hazard area and shorelands.

Tidal Wetlands: The CCMA defines tidal wetlands as:

> "those areas which border on or lie beneath tidal waters, such as, but not limited to banks, bogs, salt marshes, swamps, meadows, flats, or other low lands subject to tidal action, including those areas now or formerly connected to tidal waters, and whose surface is at or below an elevation of one foot above local extreme high water; and upon which may grow or be capable of growing some but not necessarily all, of the following: (wetland vegetation - see CGS Section 22a-29(2) for complete list of species)." [CGS Section 22a-29 as referenced by CGS Section 22a-93(7) (E)]

State tidal wetland statutes (CGS Sections 22a-28 through 22a-35) require preservation and protection of these sensitive resources except under extremely limited and unavoidable circumstances. Any dredging, filling or placing of structures within wetland areas requires permits from DEP Coastal Resources Management Division in accordance with CGS Section 22a-363. Generally, only those activities that offer significant public benefits and where adverse impacts are minimized are permitted in these areas. For further information on permit requirements, contact the permit section of the DEP Coastal Resources Management Division at 566-7404.

The Army Corps of Engineers also regulates activities within tidal wetlands. For more information regarding their permit program, call 1-800-343-4678.

Ideally, the development of the site should be designed to avoid any encroachment on wetlands. Overlooks to provide scenic access and wildlife

observation opportunities, if desired, should be located on the adjacent upland.

Coastal Flood Hazard Area: The CCMA defines coastal flood hazard areas as:

> "those land areas inundated during coastal storm events or subject to erosion induced by such events, including flood hazard areas as defined and determined by the National Flood Insurance Act, as amended (U.S.C. 42 Section 4101, P.L. 93-234) and all erosion hazard areas as determined by the Commissioner." [CGS Section 22a-93(7) (H)]

Coastal flood hazard areas should be developed to minimize risks to the public and property. Passive recreation is a particularly compatible use for these areas. However, location of potential "floatables" such as picnic tables and portable sanitary facilities should be located out of the flood hazard area or be suitably anchored and floodproofed.

Shorelands: The statutory definition of shorelands is:

> "those land areas within the coastal boundary exclusive of coastal hazard areas, which are not subject to dynamic coastal processes and which are comprised of typical upland features such as bedrock hills, till hills and drumlins." [CGS Section 22a-93(7) (M)]

Typically, shorelands are those portions of the coastal boundary that are most likely to readily support development. However, some sites, including the Beacon Hill property, are characterized by severe topography which renders them less suitable for intensive development. Passive recreation is ideal for the portions of these sites that can safely be accessed by the general public. Extreme slopes should generally be "off-limits" to avoid accidental injuries.

Consistency with Applicable CCMA Uses Policies

The CCMA coastal use policies which may apply to this site are general development and water-dependent uses.

General Development: The CCMA requires that development proceed in a manner consistent with the capabilities of the site to support it. The Beacon Hill site

is well-suited to passive recreation. However, careful and sensitive design for all site improvements is necessary to assure that potential impacts to sensitive resources on and adjacent to the site are minimized.

Water-Dependent Uses: The CCMA defines water-dependent uses as:

> "those uses and facilities which require direct access to, or location in, marine or tidal waters and which therefore, cannot be located inland, including but not limited to: marinas, recreational and commercial fishing and boating facilities, finfish and shellfish processing plants, waterfront dock and port facilities, shipyards and boat building facilities, navigation aids, basins and channels, industrial uses dependent upon waterborne transportation or requiring large volumes of cooling or process water which cannot reasonably be located or operated at an inland site and uses which provide general public access to marine or tidal waters." [CGS Section 22a-93(16)]

The CCMA also requires that highest priority be given to water-dependent uses on waterfront sites.

Although the Beacon Hill site is not a waterfront site, some discussion has occurred regarding inclusion of an adjacent State-owned parcel into the overall development of the Beacon Hill site. The State-owned parcel abuts the Farm River and could possibly be used to provide limited access to the water. Although there was no on-site inspection of this parcel, it is unlikely it could be developed extensively for water-dependency without unacceptable adverse impacts to the adjacent tidal wetlands. Public access, particularly in the form of passive recreation and, perhaps limited small boat launching opportunities (i.e., hand launching of "car-top" type boats) appear appropriate water-dependent uses for this adjacent site.

Potential Adverse Impacts as Defined by the CCMA

The CCMA defines specific adverse impacts that must be minimized for a project to be consistent with the CCMA. Additionally, all remaining adverse impacts must be determined acceptable. The statutorily-defined adverse impacts that must be assessed for any project on the site are those affecting visual quality, the

characteristics and functions of resources, water quality, and future water-dependency.

Visual Access: The CCMA promotes the maintenance of visual quality by discouraging alteration of natural features of vistas and viewpoints [CGS Section 22a-93(15) (F)]. To minimize alterations of the views, both from Beacon Hill and of Beacon Hill from the surrounding area, disruption of the natural topography and vegetation should be minimized. Minimal clearing of vegetation to develop and improve the trail system on the site and to improve the views from the site would probably be acceptable. Widespread site clearing should be avoided, particularly on and immediately above the side slopes of the ridge.

Characteristics and Functions of Resources: The CCMA discourages:

> "degrading tidal wetlands and other sensitive coastal resources through significant alteration of their natural characteristics or function." [CGS Section 22a-93(15) (H)]

Provided all development occurs on the upland portion of the site and suitable resource setbacks and soil erosion and sedimentation controls are applied, development of passive recreational facilities on the site should not create unacceptable adverse impacts to resources.

Water Quality: The CCMA requires that potential adverse impacts to water quality be minimized and that any remaining impacts be acceptable. To minimize these impacts, any sanitary facilities proposed for the site should be located out of the coastal flood hazard area or be floodproofed. This would avoid problems both with flood-borne debris and flood water infiltration of any septic system proposed.

Future Water-Dependency: Although the site is not on the waterfront, consideration of potential adverse impacts to future water-dependent use would be applicable if the State-owned parcel between Beacon Hill and the Farm River was included in the project. If that parcel were included and public access was a

component of the project plans, potential adverse impacts to future water-dependent uses would be non-existent because the project would be providing a water-dependent use where none currently exists.

Summary and Recommendations

The site is characterized by severe limitations to intensive development. However, it is ideally suited to passive recreation. These recommendations should be considered in planning:

1) Intrusion into the tidal wetlands on and adjacent to the site should be minimized to avoid adverse impacts to this sensitive resource. Site development planning should avoid encroachment on the tidal wetlands. If intrusion is unavoidable, permits from the DEP Coastal Resources Management Division and the Army Corps of Engineers are required for the placement of structures, fill or dredging in tidal wetlands.

2) All items that could be flood-borne should be located out of the coastal flood hazard area or anchored and floodproofed, including picnic tables and portable sanitary facilities.

3) Permanent sanitary facilities, if desired, should be located out of the coastal flood hazard area or floodproofed to prevent water quality problems that could result from flooding a septic system.

4) Opportunities to enjoy the views from Beacon Hill, both from the top of the quarry area and from a vantage point on the western side of the ridge, should be maximized.

5) Disruption to the natural topography of the hill and vegetation should be minimized to maintain the visual quality of the hill from the surrounding area.

LAND USE PLANNING CONSIDERATIONS

The site is situated in the Branford Hills section of Town. Land use in the area is characterized by a rather complex mixture of uses, including low density single-family detached dwellings, multi-family townhouses, commercial, institutional and limited industrial operations. The site is surrounded by medium density single-

family detached dwellings to the north (Dominican Road) and northeast (Rose Hill Road), the Shore Line Trolley Museum property to the southwest and regulated tidal wetlands to the southeast, south and west. The surrounding residential properties are zoned R-4, a residence district requiring a minimum lot area of 20,000 square feet, which covers much of the suburban single-family residential sections of Town. The Branford Zoning Regulations define the R-4 District as:

> "The applicable standards are designed to encourage and protect the existing high quality development with ample lots to provide private sewage disposal systems pending eventual extension of sewers. Institutions and similar uses will be necessary and appropriate in this district but only as special uses upon finding that development will be compatible with the character of the district."

The R-4 District also allows for recreation facilities and nature preserves by Special Use permit when conducted by a non-profit corporation and not as a business or for profit.

The 1972 Comprehensive Plan of Development for Branford depicts the site as Suburban Residential. The trolley line at the base of the western slope of Beacon Hill and regulated tidal wetlands are categorized as Open Space and Conservation Lands, respectively. The Branford Planning and Zoning Commission should be encouraged and allocated funds to update the Plan of Development, particularly the natural resource mapping components.

By virtue of being selected as an eligible site for the Connecticut Natural Heritage Trust program, the Beacon Hill property has been acknowledged as a site of unique character worthy of being preserved for its inherent natural attributes.

The intended conservation, recreational and cultural use of the site should not detract from the surrounding residential property owners. Open space areas are considered a positive amenity and add value to surrounding properties.

Presently, the site is undeveloped with a rough network of trails starting at the base of Beacon Hill and looping along the ridge top. Abandoned vehicles lie at the

base of the old stone quarry. Litter and metal debris (i.e., old appliances, etc.) are scattered near the site of the former swine farm in the northern section of the site. Up-rooted hardwood trees from recent storms crisscross the overgrown trail system.

RECREATIONAL OPPORTUNITIES

Recreational Management Plan

The site is ideally suited for passive recreation activities which do not require intensive or expensive development and facilities. The Shore Line Trolley Museum and rail lines provide an outstanding opportunity to integrate the cultural and historic resources of the Branford Electric Railway Association with the natural resources of the nearby salt marshes and Beacon Hill uplands.

The Branford Land Trust and the Town should work closely with the Trolley Museum when forming any overall land use plan for the site. Stops on the trolley line could be developed at trail entry points (i.e., quarry face and quarry trestle) for people to get off and on the open trolly cars. Parking could be provided at the Trolley Museum surface lot adjacent to the Trolley Museum, eliminating the need for any large parking area on or adjacent to the site. The Dominican Road access is restricted by the adjacent residential neighborhood. The cul-de-sac has limited on-street parking availability, enough space possibly for 5 vehicles. Any type of car path and rough parking area off of Dominican Road would interfere with the neighbors and be physically constrained by the steep slopes.

The Town is very fortunate to have outstanding recreational facilities available to its residents. Through foresight, generous donations and keen awareness, the residents of Branford can take advantage of the active recreation facilities at the Parker Memorial, Veterans and Foote Park systems, as well as the passive recreation sites scattered throughout all districts of the Town. Every section of the

community will be served by nearby open space natural areas with the joint acquisition of the Beacon Hill site. The current Statewide Comprehensive Outdoor Recreation Plan (SCORP) lists the Town of Branford as the owner of 2,953 acres of open space, which is approximately 17% of the overall Town acreage. This percentage represents the second highest total for the region and one of the highest in the State.

Many opportunities exist for the Town and the Branford Land Trust to enlist volunteers to clear the trails, construct boardwalks and footpaths, remove litter and possibly fence off the site. Perhaps an arrangement could be worked out with the Quinnipiac Council of the Boy Scouts of America (BSA). An agreement between the Quinnipiac Council BSA, the Trolly Museum and the Branford Land Trust might be arranged where the Scouts are assigned various tasks (i.e., trail clearing, construction of benches, blue bird boxes, signs, boardwalks and fencing) in return for permission to use the site for limited overnight camping programs, workshops and canoeing. The site provides an excellent "outdoor theater" to introduce boys and girls to various outdoor experiences. In past years, Kelsey Island at the mouth of the Farm River Estuary was generously made available by the owners for overnight camping by organized youth groups. The Beacon Hill site would provide an excellent linkage to the Island, if proper arrangements could be worked out.

A long-term recreation option for the site includes eventually linking the Trolley Museum/Beacon Hill trails with the South Central Regional Water Authority Saltonstall trail system and the Branford Supply Pond property to form a continuous trail covering close to 10 miles from the Farm River Estuary salt marsh to the 350-acre Branford Supply Pond Park highlands. The South Central Regional Water Authority implemented a successful recreation program at Lake Saltonstall in 1983. Designated areas of the property are open to the public by permit for recreational uses (i.e., hiking, fishing and cross-country skiing). According to the 1988 supplement to

the Regional Water Authority Land Use Plan, the land around Furnace Pond, where the treatment facility is located adjacent to Route 1, has been slated for development, which has been postponed until further hydrological studies are completed. If the land is to be developed, the Branford Land Trust should investigate the possibility of acquisition of conservation easements to assure future trail linkage.

Other key natural areas in Branford are presently being managed by a 5-member Commission. The Branford Supply Ponds, Pisgah Brook and the Stony Creek Quarry all fall under the Commission's jurisdiction. The Commission performs the very difficult task of overseeing some 960 acres of non-contiguous Town-owned property. The Commission operates on a very limited budget, employing a part-time warden and a few assistant wardens to police and maintain the dispersed sites. Complaints of littering, motorized vehicles and other infractions are investigated promptly by the Commission. The Commission has a good working relationship with the Branford Police, Public Works and Recreation Departments.

The ever increasing problem of illegal dumping of trash and other debris is one of the greatest problems experienced in the designated natural areas within the State. If the Commission will be ultimately responsible for the administration of the Beacon Hill site, additional Commission members and/or an increased budget allocation seems necessary.

Site Planning

A very primitive trail loop exists on the site. Volunteers from the local Branford Land Trust and other organizations will be needed to clear and mark the trail. The loop trail should start at the northern base of the western slope and run parallel with the rail bed, ascend to the summit near the quarry face, flatten out across the plateau and switch back to the first entry point. A few scenic vistas could be provided along the traprock ridgeline at the quarry face, near the northern bluff and other key spots with some selective tree cutting. The main trail would loop the entire site,

encompassing approximately 1 mile. The trail system should use the gradual slopes and dry areas whenever possible to avoid unnecessary erosion.

The DEP owns a 20-acre upland area in the marshlands near the trolley lines. This is a potential site for a picnic area with tables and a few port-a-toilets. This use requires on-going maintenance (i.e., garbage pickup, toilet pumpouts and associated general repair work). Consideration might be given to constructing a boardwalk over the old mosquito ditches across the tidal wetlands. The platform would provide access for bird watching, fishing and crabbing.

Group camping sites could be established near the former swine farm or in a clearing off the loop trail. There should be a few centralized sites rather than a number of dispersed campsites for proper control.

Other recreational uses for the site include supervised and insured rock climbing and cross-country skiing. Activities which do not mesh well with the surrounding land use include hunting and use of off-road motorized vehicles.

RECREATIONAL PLANNING

Because of the generally rough topography and shallow to bedrock soils, the site's potential uses are limited. Basically, it should remain as natural open space, offering trails and overlook points. More specifically, it could serve as the southernmost stretch of a north-south trail running the entire width of the State from Long Island Sound into Massachusetts on traprock ridges as described in the articles in Appendix D.

Specific management issues to be addressed include:

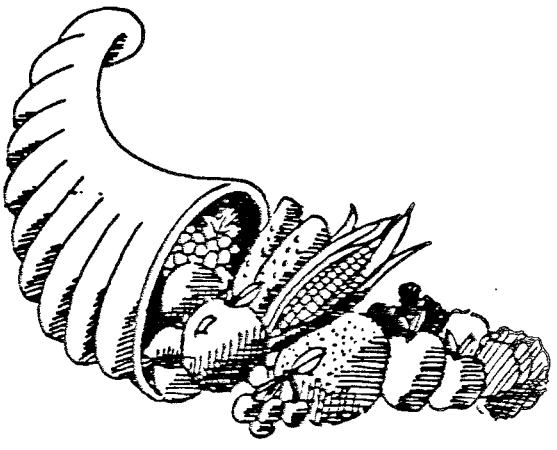
1) An appropriate trail system should be developed, using existing trails where suitable and relocated or repaired trails where necessary. This system should include a blazed trail to the old dock at tidewater on the DEP-owned island south of Beacon Hill.

2) To provide effective public access to the site, 1 or 2 trailhead parking lots could be developed at suitable locations with capacity for up to 10 cars each.

3) The trash and junked cars which reportedly litter the site should be removed.

4) Vegetation should be removed as needed to open up and maintain vistas.

APPENDICIES



Appendix A: Soil Limitation Chart

TABLE 1: SOIL CHARACTERISTICS

Soil Symbol	Soil Name	Hydrologic Soil Group	Flooding Frequency	Flooding Duration	Flooding Months	Water Table Depth (ft)	Water Table Kind	High Water Table Months	Bedrock Depth (in)	Bedrock Hardness
BoC	Branford silt loam, 8-15% slopes	B	none	---	---	>6.0	---	---	>60	---
CyC	Cheshire-Holyoke complex, 3-15% slopes	Cheshire - B	none	---	---	---	---	---	>60	hard
		Holyoke - C/D	none	---	---	>6.0	---	---	10-20	---
Eh	Ellington silt loam	B	none	---	---	1.5-3.5	apparent	Nov-Apr	>60	---
HuD	Holyoke-Cheshire complex, 15-35% slopes	Holyoke - C/D	none	---	---	>6.0	---	---	10-20	hard
		Cheshire - B	none	---	---	>6.0	---	---	>60	---
LpB	Ludlow silt loam, 3-8% slopes	C	none	---	---	1.5-3.5	perched	Nov-Apr	>60	---
Ra	Raynham silt loam	C	none	---	---	0-0.5	apparent	Nov-May	>60	---
We	Westbrook mucky peat	C	frequent	very brief	Jan-Dec	+1-0	apparent	Jan-Dec	>60	---

Soil Symbol	Soil Name	Hydrologic Soil Group	Flooding Frequency	Flooding Duration	Flooding Months	Water Table Depth (ft)	Water Table Kind	High Water Table Months	Bedrock Depth (in)	Bedrock Hardness
WkD	Wethersfield loam, 15-25% slopes	C	none	---	---	>6.0	---	---	>60	---
Pr	Pit	*	*	*	*	*	*	*	*	*

Hydrologic soil groups

A - Soils having a high infiltration rate (low runoff potential) when thoroughly wet.

B - Soils having a moderate infiltration rate when thoroughly wet.

C - Soils having a slow infiltration rate when thoroughly wet.

D - Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet.

For High Water Table

Apparent - A thick zone of free water in the soil.

Artesian - A water table under hydrostatic head, generally beneath an impermeable layer.

Perched - A water table standing above an unsaturated zone.

* On-site investigation and evaluation is needed

TABLE 2: SOIL LIMITATIONS

Soil Symbol	Camp Areas	Picnic Areas	Playgrounds	Paths and Trails
BoC	Moderate - slope	Moderate - slope	Severe - slope	Slight
CyC -- Cheshire	Moderate - large stones, slope	Moderate - slope	Severe - slope	Moderate - large stones
-- Holyoke	Moderate - large stones, slope	Moderate - slope	Severe - slope, depth to bedrock	Moderate - large stones
Eh	Moderate - wetness	Slight	Moderate - wetness	Slight
HuD -- Holyoke	Severe - slope	Severe - slope	Severe - slope, depth to bedrock	Severe - slope
-- Cheshire	Severe - slope	Severe - slope	Severe - slope	Severe - slope
LpB	Moderate - percolates slowly, wetness	Slight	Moderate - slope, percolates slowly, wetness	Slight
Ra	Severe - wetness	Severe - wetness	Severe - wetness	Severe - wetness
We	Severe - wetness, floods, excess humus	Severe - wetness, floods, excess humus	Severe - wetness, floods, excess humus	Severe - wetness, floods, excess humus
WkD	Severe - slope	Severe - slope	Severe - slope	Moderate - slope
Pr	*	*	*	*

Absence of an entry indicates the feature is not a concern.

Slight - Soil properties are generally favorable and limitations are minor and easily overcome.

Moderate - Limitations can be overcome or alleviated by planning, design, or special maintenance.

Severe - Soil properties are unfavorable and limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

* On-site investigation and evaluation is needed

Appendix B: DEP Correspondence

BEACON HILL

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

March 23, 1982

Ms. Lauren Brown
303 Thimble Island Rd.
Branford, CT 06405

Dear Lauren,

Here are the things you requested. The copy of the print-out is from the 1973 survey of the area. One of our field workers re-visited the site last summer. (She couldn't find the Opuntia either). You'll notice on the print-out that the significance level was originally "local, state and regional". Over the past year I have been re-evaluating the updated natural areas. A description of the significance levels and criteria I used is attached.

Based on these criteria and the field data I cannot justify listing Beacon Hill or the Salt Marsh as of Regional or State significance. When the Inventory was first conducted, aesthetic and recreational values played a more important role in determining an areas significance ~~than~~ they do now. This does not mean that the area is any less important from the town's perspective.

I've also included a flow chart illustrating the natural area nomination process and a description of our evaluation criteria and considerations.

Hope this is what you needed. Let me know if there is anything else I can do.

Yours Truly,

Sarah Fried

Sarah Fried
Natural Resources Center
DEP

Phone: 566-3540
State Office Building, Hartford, Connecticut 06115

Appendix C: Excerpts from the Connecticut Coastal Management Act

ATTACHMENT

EXCERPTS FROM THE CCMA APPLICABLE TO BEACON HILL RECREATION PLANNNING

COASTAL RESOURCE POLICIES

GENERAL RESOURCE

to preserve and enhance coastal resources in accordance with the policies established by chapters 439, 440, 447, 473, 474, 474a and 477 [C.G.S. Section 22a-92(a)(2)]

the general assembly hereby declares that the policy of the state of Connecticut is to conserve, improve and protect its natural resources and environment and to control air, land and water pollution in order to enhance the health, safety and welfare of the people of the state [C.G.S. Section 22a-1 as referenced by C.G.S. Section 22a-92(a)(2)]

it is hereby found and declared that there is a public trust in the air, water and other natural resources of the state of Connecticut and that each person is entitled to the protection, preservation and enhancement of the same [C.G.S. Section 22a-15 as referenced by C.G.S. Section 22a-92(a)(2)]

the commissioner shall carry out the environmental policies of the state and shall have all powers necessary and convenient to faithfully discharge this duty. In addition to, and consistent with the environment policy of the state, the commissioner shall (a) promote and coordinate management of water, land and air resources to assure their protection, enhancement and proper allocation and utilization; (b) provide for the protection and management of plants, trees, fish, shellfish, wildlife and other animal life of all types, including the preservation of endangered species; (c) provide for the protection, enhancement and management of the public forests, parks, open spaces and natural area preserves; (d) provide for the protection, enhancement and management of inland, marine and coastal water resources, including, but not limited to, wetlands, rivers, estuaries and shorelines; (e) provide for the prevention and abatement of all water, land and air pollution including, but not limited to, that related to particulates, gases, dust, vapors, noise, radiation, odors, nutrients and cooled or heated liquids, gases and solids; (f) provide for control of pests and regulate the use, storage and disposal of pesticides and other chemicals which may be harmful to man, sea life, animals, plant life or natural resources; (g) regulate the disposal of solid waste and liquid waste, including but not limited to, domestic and industrial refuse, junk motor vehicles, litter and debris, which methods shall be consistent with sound health, scenic

environmental quality and land use practices; (h) regulate the storage, handling and transportation of solids, liquids and gases which may cause or contribute to pollution; and (i) provide for minimum state-wide standards for the mining, extraction, excavation or removal of earth materials of all types [C.G.S. Section 22a-5, referenced by Section 22a-92(a)(2)]

TIDAL WETLANDS

to preserve tidal wetlands and to prevent the despoliation and destruction thereof in order to maintain their vital natural functions [C.G.S. Section 22a-92(b)(2)(E)]

to encourage the rehabilitation and restoration of degraded tidal wetlands [C.G.S. Section 22a-92(b)(2)(E)]

where feasible and environmentally acceptable, to encourage the creation of wetlands for the purpose of shellfish and finfish management, habitat creation and dredge spoil disposal [C.G.S. Section 22a-92(b)(2)(E)]

it is declared that much of the wetlands of this state have been lost or despoiled by unregulated dredging, dumping, filling and like activities and despoiled by these and other activities, that such loss or despoliation will adversely affect, if not entirely eliminate, the value of such wetlands as sources of nutrients to finfish, crustacea and shellfish of significant economic value; that such loss or despoliation will destroy such wetlands as habitats for plants and animals of significant economic value and will eliminate or substantially reduce marine commerce, recreation and aesthetic enjoyment and that such loss of despoliation will, in most cases, disturb the natural ability of tidal wetlands to reduce flood damage and adversely affect the public health and welfare; that such loss or despoliation will substantially reduce the capacity of such wetlands to absorb silt and will thus result in the increased silting of channels and harbor areas to the detriment of free navigation. Therefore, it is declared to be the public policy of this state to preserve the wetlands and to prevent the despoliation and destruction thereof [C.G.S. Section 22a-28 as referenced by C.G.S. Section 22a-92(a)(2)]

to disallow any filling of tidal wetlands and nearshore, offshore and intertidal waters for the purpose of creating new land from existing wetlands and coastal waters which would otherwise be undevelopable, unless it is found that the adverse impacts on coastal resources are minimal [C.G.S. Section 22a-92(c)(1)(B)]

in granting, denying or limiting any permit the commissioner or his duly designated hearing officer shall consider the effect of the proposed work with reference to the public health and welfare, marine fisheries, shellfisheries, wildlife, the

protection of life and property from flood, hurricane and other natural disasters, and the public policy set forth in Sections 22a-28 to 22a-35 inclusive. The fact that the department of environmental protection is in the process of acquisition of any tidal wetlands by negotiation or condemnation under the provisions of Section 26-17a, shall be sufficient basis for denial of any permit [C.G.S. Sec. 22a-33 as referenced by C.G.S. Sec. 22a-92(a)(2)]

COASTAL FLOOD HAZARD AREA

to manage coastal hazard areas so as to insure that development proceeds in such a manner that hazards to life and property are minimized [C.G.S. Section 22a-92(b)(2)(F)]

to promote nonstructural solutions to flood and erosion problems except in those instances where structural alternatives prove unavoidable and necessary to protect existing inhabited structures, infrastructural facilities or water-dependent uses [C.G.S. Section 22a-92(b)(2)(F)]

to maintain the natural relationship between eroding and depositional coastal landforms [C.G.S. Section 22a-92(b)(2)(J)]

to minimize the adverse impacts of erosion and sedimentation on coastal land uses through the promotion of nonstructural mitigation measures [C.G.S. Section 22a-92(b)(2)(J)]

structural solutions are permissible when necessary and unavoidable for the protection of infrastructural facilities, water-dependent uses, or existing inhabited structures, and where there is no feasible, less environmentally damaging alternative and where all reasonable mitigation measures and techniques have been provided to minimize adverse environmental impacts [C.G.S. Section 22a-92(b)(2)(J)]

to maintain, enhance, or, where feasible, restore natural patterns of water circulation and fresh and saltwater exchange in the placement or replacement of culverts, tide gates or other drainage or flood control structures [C.G.S. Section 22a-92(c)(2)(B)]

it is hereby found and declared that, because of the occurrence of severe storms accompanied by winds up to hurricane force, abnormal high tides and tide flooding, the lives and property of residents and other persons within areas exposed to such hazards are endangered, and that, in the interest of public health, safety and general welfare, it is necessary to minimize, and as far as possible to prevent, loss of life, property and revenue to municipalities and the state from taxation by the construction of protective works on or near shores and beaches within such areas. As title to the land between high and low watermark is vested in the state, it is further found and declared to be in the public interest to secure such exposed

areas by the most economical and effective means for safeguarding life and protecting property and, because it is uneconomical and ineffective for the general purpose for an individual landowner to attempt to maintain protective installations separated from and lacking co-extension with those of abutting properties, that it is in the public interest to provide ways and means for collective and cooperative action to alleviate the dangers and destruction common to such exposed areas. It is further found and declared that because of the recurrence of severe flooding of many of the waterways of the state and their tributaries, taking a huge toll in life and property, extensive flood protection measures must be inaugurated. It is, therefore, found and declared to be in the public interest that encroachment limits along waterways be established and any flood control features at dams and reservoirs be utilized as a part of the construction and installation of any flood control project [C.G.S. Sec.25-69, referenced by Sec. 22a-92(a)(2)]

land areas fronting on the ocean, or on bays, inlets and coves, or bordering on rivers in which tides occur, that are subject to the full force of storms; or land areas in direct contact with storm waves, including banks, bluffs, cliffs, promontories and headlands or similar topographical or geological formations, that are subject to erosion through wave action; or open beach areas, including spits, dunes and barrier beaches, that are subject to loss of sand through high waves, strong currents or scouring wave action; or land areas subject to inundation during storms or vulnerable to storm damage because of geographic situation, may be classed as exposed areas within the meaning of sections 25-69 to 25-75, inclusive. The limits of such areas shall be the extent of the natural configuration of the land surface not necessarily co-extensive with political boundaries, and shall include privately-owned and municipally-owned properties upon which public money may be spent and public debt incurred for the protection and conservation thereof, and taxes levied to support expenditures for such purposes [C.G.S. Section 25-70, referenced by Section 22a-92(a)(2)]

the commissioner shall establish, along any tidal or inland waterway or flood-prone area considered for stream clearance, channel improvement or any form of flood control or flood alleviation measure, lines beyond which, in the direction of the waterway or flood-prone area, no obstruction or encroachment shall be placed by any person, firm or corporation, public or private, unless authorized by said commissioner. The commissioner shall issue or deny permits upon applications for establishing such encroachments based upon his findings of the effect of such proposed encroachments upon the flood carrying and water storage capacity of the waterways and floodplain, flood heights, hazards to life and property, and the protection and preservation of the natural resources and ecosystems of the state, including but not limited to ground and surface water, animal, plant and aquatic life, nutrient exchange, and energy

flow, with due consideration given to the results of similar encroachments constructed along the reach of waterway [C.G.S. Section 25-4a, referenced by Section 22a-92(a)(2)]

to require as a condition in permitting new coastal structures, including but not limited to groins, jetties or breakwaters, that access to, or along, the public beach below mean high water must not be unreasonably impaired by such structures [C.G.S. Section 22a-92(c)(1)(K)]

SHORELANDS

to regulate shoreland use and development in a manner which minimizes adverse impacts upon adjacent coastal systems and resources [Section 22a-92(b)(2)(I)]

APPLICABLE CCMA USES POLICIES

GENERAL DEVELOPMENT

to insure that the development, preservation or use of the land and water resources of the coastal area proceeds in a manner consistent with the capability of the land and water resources to support development, preservation or use without significantly disrupting either the natural environment or sound economic growth [Section 22a-92(a)(1)]

to resolve conflicts between conflicting uses on the shorelands adjacent to marine and tidal waters by giving preference to uses that minimize adverse impacts on natural coastal resources while providing long-term and stable economic benefits [C.G.S. Section 22a-92(a)(4)]

it is found and declared that there exists in the state a great and growing need for industrial and commercial development and activity to provide and maintain employment and tax revenues; that assistance and encouragement of industrial and commercial development to provide and maintain such employment and revenues is an important function of the state; that the availability of financial assistance and suitable facilities are important inducements to industrial and commercial enterprises to remain or locate in this state and therefore the necessity in the public interest and for the public benefit and good for the provisions of this chapter is hereby declared as a matter of legislative determination. It is further found and declared that there exists a great and growing need for the construction of facilities by private water companies in the state for the furnishing of clear and wholesome water to the general public and that financial assistance by the Connecticut development authority is an important inducement to such companies to construct such facilities and therefore this necessity in the public interest and for the public benefit and good is hereby declared as a matter of legislative determination. It is

further found and declared that there exists a great and growing need for the acquisition and construction of ferry boats for the transportation of persons, goods or vehicles and of all facilities, equipment, land and improvements necessary or useful in connection with ferry operations in coastal and inland waterways of the state, and that financial assistance by the Connecticut development authority is an important inducement to the acquisition and construction of ferry boats and such related facilities and therefore this necessity in the public interest and for the public benefit and good is hereby declared as a matter of legislative determination. It is futher found and declared that there exists a great and growing need for the acquisition and construction of railroads for the operation of freight and passenger trains and associated equipment to transport persons and goods and for the acquisition and construction of: Facilities and equipment necessary or useful in connection with railroad operations, including railroad right-of-way and all associated tracks and facilities, including but not limited to switches, sidings, yards, signal systems and bridges; related plant facilities, including but not limited to station building, maintenance facilities and storage facilities; locomotives and rolling stock and other railroad related equipment, including but not limited to maintenance of way equipment, shop equipment, communications equipment and snow and wreck clearing equipment and that financial assistance by the Connecticut development authority is an important inducement to the acquisition and construction of railroads and associated facilities and equipment and therefore this necessity in the public interest and for the public benefit and good is hereby declared as a matter of legislative determination. It is further found that there exists in the state a great and growing need for the development of municipal civic and cultural centers to furnish recreation to the general public and to improve the economy of the state, increase employment and provide a wider tax base, and that financial assistance by the Connecticut development authority is an important inducement to the acquisition and construction of municipal civic and cultural centers and related facilities, and therefore this necessity in the public interest and for the public benefit and good is hereby declared as a matter of legislative determination. It is further found and declared that there exists in the state a great and growing need for the conservation, protection and improvement of the natural resources and environment and to control land, water, sewer, air, noise and general environmental pollution derived from the operation of industry and commerce to provide facilities to control such pollution is an important function of the state; that the availability of financial assistance by the state is an important inducement to industry and commerce to control such pollution and therefore the necessity in the public interest and for the public benefit and good for the provisions of this chapter, is hereby declared as a matter of legislative determination, and shall be a guiding policy of the department of economic development. It is further found and declared that there is a necessity in the state of

creating a department of economic development to coordinate and be responsible for matters affecting the growth of business and industry in the state and the maintenance and development of industry in the state as well as the promotion of tourism in the state and for the establishment and creation of an authority to assist the department and the state to carry out the needs and policies of the state as set forth in this section [C.G.S. 32-23c]

WATER-DEPENDENT USES

to give high priority and preference to uses and facilities which are dependent upon proximity to the water or the shorelands immediately adjacent to marine and tidal waters [C.G.S. Section 22a-92(a)(3)]

to manage uses in the coastal boundary through existing municipal planning, zoning and other local regulatory authorities and through existing state structures, dredging, wetlands, and other state siting and regulatory authorities, giving highest priority and preference to water-dependent uses and facilities in shorefront areas [C.G.S. Section 22a-92(b)(1)(A)]

ADVERSE IMPACTS AS DEFINED BY THE CCMA

VISUAL ACCESS

degrading visual quality through significant alteration of the natural features of vista and veiw points [C.G.S. Section 22a-93(15)(F)]

CHARACTERISTICS AND FUNCTIONS OF RESOURCES

degrading tidal wetlands, beaches and dunes, rocky shorefronts, and bluffs and escarpments through significant alteration of their natural characteristics or function [C.G.S. Section 22a-93(15)(H)]

WATER QUALITY

degrading water quality through the significant introduction into either coastal waters or groundwater supplies of suspended solids, nutrients, toxics, heavy metals or pathogens, or through the significant alteration of temperature, pH, dissolved oxygen or salinity [C.G.S. Section 22a-93(15)(A)]

FUTURE WATER-DEPENDENCY

adverse impacts on future water-dependent development opportunities" and "adverse impacts on future water-dependent development activities" include but are not limited to (A) locating a non-water-dependent use at a site that (i) is

physically suited for a water-dependent use for which there is a reasonable demand or (ii) has been identified for a water-dependent use in the plan of development of the municipality of the zoning regulations; (B) replacement of a water-dependent use with a non-water-dependent use; and (C) siting of a non-water-dependent use which would substantially reduce or inhibit existing public access to marine or tidal waters [C.G.S. Section 22a-93(17)]

Appendix D: Newspaper Articles

Rich in traprock, a major aquifer may face threat

A ridge as a resource

By STEVE GRANT
Courant Staff Writer

The ridge rises dramatically from the lowlands, bisecting the state from top to bottom in as bold a geologic statement as the Connecticut landscape makes.

It is a wall of dense rock that once was the superheated liquid of the Earth's deep interior. Today its best-known features carry names like West Rock, Mount Higby, Avon Mountain, Talcott Mountain.

Yet as striking as the ridge is, some scientists and conservationists believe it is taken for granted, that its ecological role is not well understood, and that it is vulnerable.

"It is a single resource that has not been looked upon as a single resource," said Jelle Z. de Boer, Stearns Professor of Earth Science at Wesleyan University. "And it is a resource that here and there is rapidly disappearing."

Besides being a striking geological formation, the ridge is simultaneously a major aquifer, a highway for animals and a scenic greenbelt pouring fresh air into the heavily populated valley that runs through the center of the state.

"Connecticut's Central Park," a Wesleyan graduate student, Holly B. Shaw, called it in an essay last year.

The entire ridge is known as Metacomet and is composed of a rock called basalt, or traprock. The west side of the ridge is often a cliff and the east side a more gradual slope.

De Boer and others are encouraged by one fact: Because for centuries the ridge was considered unsuitable for development, it was virtually ignored. Today much of it — but not all — is held by the state or utility companies.

At the moment, there are seven privately owned quarries where the traprock is mined and crushed for road building and other uses. In 1988, the most recent year for which the state has estimates, 11.4 million tons of crushed stone worth more than $75 million were mined in Connecticut, most of it traprock from Metacomet Ridge. Roncari Industries recently proposed expanding its 70-acre East Granby traprock quarry by an additional 113 acres.

In addition to mining, some of the more accessible and less steep sections are beginning to attract residential development.

"Development bit by bit is creeping onto these ridges," said Joe Hickey, state-park planner with the state Department of Environmental Protection.

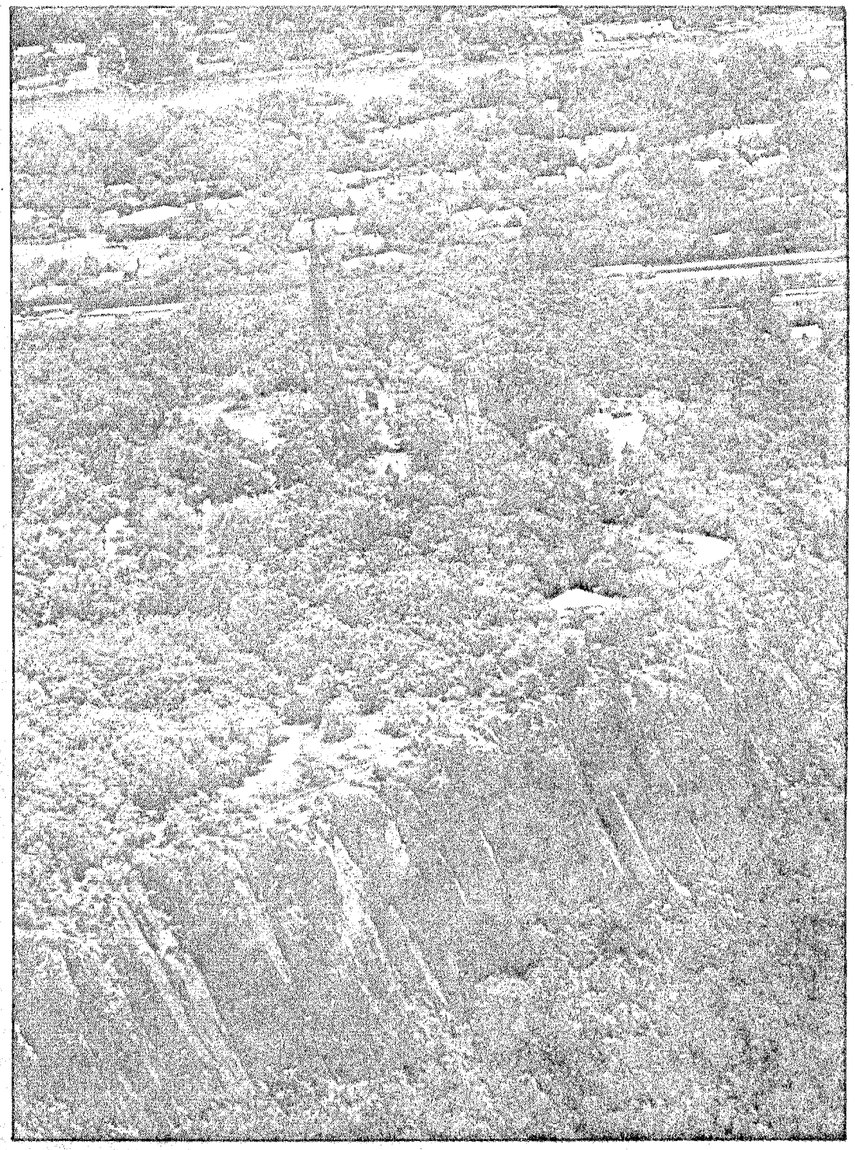
Because of the new pressures, Hickey and James Gibbons, a land-use specialist with the University of Connecticut Cooperative Extension System, are preparing a letter that will be sent to planning and zoning officials in towns traversed by the ridge.

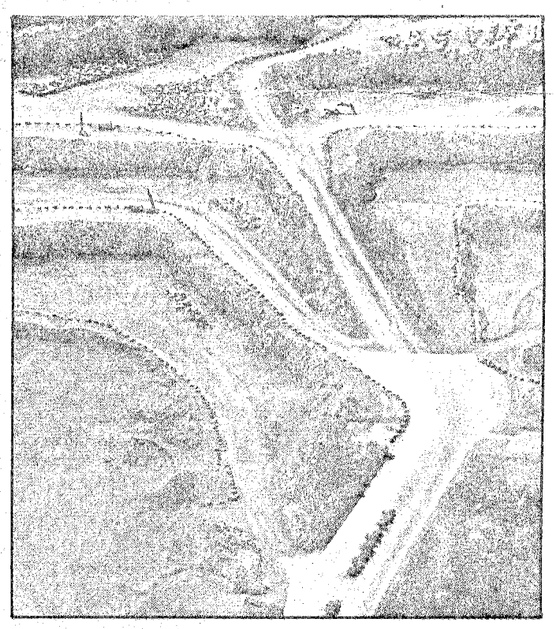
Gibbons said towns can study the ridge and decide whether parts of it should be set aside permanently as open space. "What we are talking about here is a major, major corridor. A natural geologic corridor," he said.

Hickey said towns might want to more aggressively seek to set aside open space before approving developments.

De Boer said the ridge's role as a major aquifer is not well

Please see An aquifer, Page E6

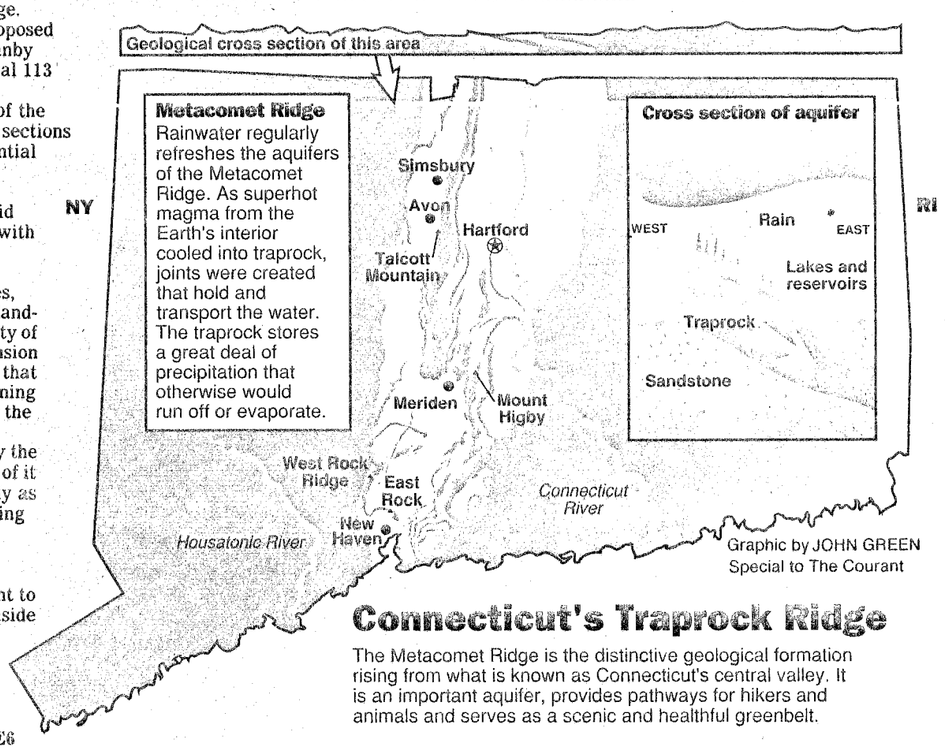




East Rock in New Haven is part of Metacomet Ridge, a striking geological formation that is simultaneously a major aquifer, a highway for animals and a scenic greenbelt pouring fresh air into the heavily populated valley that runs through the center of the state.

At the Tilcon Tomasso traprock quarry in New Britain, rock is mined and crushed for road-building and other uses. In 1988, the most recent year for which the state has estimates, 11.4 million tons of crushed stone worth more than $75 million were mined in Connecticut, most of it traprock from Metacomet Ridge.

Photos by
TONY BACEWICZ
The Hartford Courant



Graphic by JOHN GREEN
Special to The Courant

Connecticut's Traprock Ridge

The Metacomet Ridge is the distinctive geological formation rising from what is known as Connecticut's central valley. It is an important aquifer, provides pathways for hikers and animals and serves as a scenic and healthful greenbelt.

An aquifer rich in traprock, Metacomet Ridge faces increased threats

Continued from Page E1

known. Vast amounts of water stored in the rock itself provide the major supply for those with wells along the ridge line. In addition, water collects in 28 lakes along the ridge (among them Lake Gaillard in North Branford and Silver Lake in Meriden), many of which supply drinking water.

Building homes along the ridge would put this water source at risk from contamination by septic systems, de Boer says, because sewer lines would be too far away. "You don't build houses on an aquifer like that," he said.

"We have to protect this reservoir area, for aesthetic as well as for reasons of common sense, of having good drinking water available," he said.

Because the ridge is an almost unbroken greenbelt, it serves as a kind of refuge and highway for animals. Biologists today believe that such "wildlife corridors" are especially important for many mammal species. The ridge also supports some unusual plant species, like prickly pear cactus, and a rare butterfly called the falcate orange-tip.

The Nature Conservancy, a private group that buys ecologically important land and sets it aside, owns part of Mount Higby. In addition, the conservancy recently was given a 55-acre piece of traprock ridge. (It has agreed not to identify the parcel until the donor has sold his adjacent home.)

The Connecticut Forest and Park Association maintains the heavily used Metacomet and Mattabesett trails along the ridge. But even those trails are being jeopardized today.

"In some places, we're forced to relocate because people are trying to build on the very ridge tops," said John Hibbard, director of the association. The latest instances came in Granby and Suffield, he said.

De Boer believes legislators should begin thinking about the ridge and set aside funds to purchase those pieces of ridge top not now protected.

Gibbons doubts that the ridge can be protected in its entirety, so he argues that the state should decide which parts are most valuable.

"I would like to see, as a first step, the state take some initiative and prepare a plan for the ridges," he said. "I guess, being a planner, I'd like to see plans drawn up.

"Preserve those areas that have something unique, or something important — like the water," he said.

Hickey said the DEP is aware of the value of the ridge. "There is interest on our part," he said. "There is a sense of urgency, and we do want to work closely with the Forest and Park Association and other land-use groups."

Extending Mattabesett hiking trail one park planner's sensible dream

Joe Hickey, state park planner with the state Department of Environmental Protection, says his idea is best described as a dream.

He'd like the Metacomet Ridge to serve as the lower backbone of a hiking trail that extends from Long Island Sound north to the state line at Suffield and on through Massachusetts into New Hampshire.

Much of that path already is in place. The Metacomet Trail extends from Berlin north to Mount Sunapee in New Hampshire. The Mattabesett Trail runs from the Metacomet south to Durham and east to Haddam.

The idea is to extend the Mattabesett Trail south another 10 or 15 miles so that it ends at Long Island Sound. "If you look at a topographic map, the potential is there," Hickey said.

The State Bond Commission recently approved the purchase of Beacon Hill in Branford, an open space area overlooking the Sound. That could serve as the southern end of the trail, Hickey said.

From Beacon Hill, the trail would extend north along the west sides of lakes Saltonstall in East Haven and Gaillard in North Branford and on to Durham. Much of that is utility-owned land.

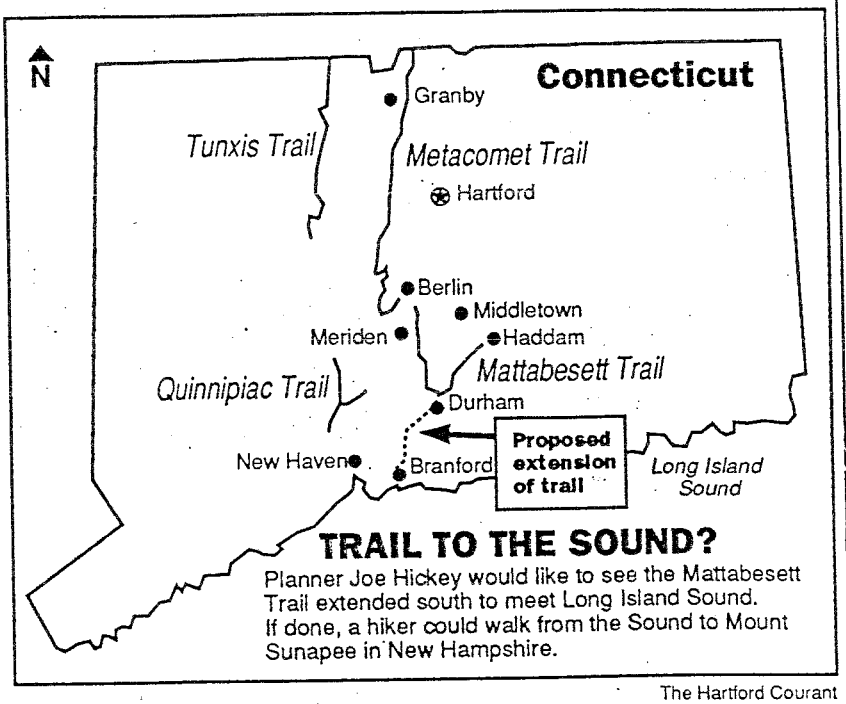
According to Paul Bofinger, director of the Society for the Protection of New Hampshire Forests, there has been talk in New Hampshire — just talk — of extending the Metacomet Trail north another 30 or 40 miles from Mount Sunapee to meet with the Appalachian Trail, which runs between Maine and Georgia.

Extending trails today is an enormously time-consuming task that requires identifying and talking with property owners to arrange easements for hikers. Bofinger said his group, which has been working for 15 years to extend the Metacomet to Mount Sunapee, would be willing to help extend it to the Appalachian Trail, but would need help.

"New Englanders like to consider themselves New Englanders in a general sense, but every once in a while there has to be some physical sense of that regional identity," he said.

"This could be one."

STEVE GRANT



The Hartford Courant

NOTES

ABOUT THE TEAM

The King's Mark Environmental Review Team (ERT) is a group of environmental professionals drawn together from a variety of federal, state and regional agencies. Specialists on the Team include geologists, biologists, soil scientists, foresters, climatologists, landscape architects, recreational specialists, engineers and planners. The ERT operates with state funding under the aegis of the King's Mark Resource Conservation and Development (RC&D) Area - an 83-town area serving western Connecticut.

As a public service activity, the Team is available to serve towns and/or developers within the King's Mark RC&D Area - free of charge.

Purpose of the Environmental Review Team

The Environmental Review Team is available to assist towns and/or developers in the review of sites proposed for major land use activities. For example, the ERT has been involved in the review of a wide range of significant land use activities including subdivisions, sanitary landfills, commercial and industrial developments and recreational/open space projects.

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

Requesting an Environmental Review

Environmental Reviews may be requested by the chief elected official of a municipality or the chairman of an administrative agency such as planning and zoning, conservation or inland wetlands. Environmental Review Request Forms are available at your local Soil and Water Conservation District and through the King's Mark ERT Coordinator. This request form must include a summary of the proposed project, a location map of the project site, written permission from the land owner/ developer allowing the Team to enter the property for purposes of review and a statement identifying the specific areas of concern the Team should investigate. When this request is approved by the local Soil and Water Conservation District and King's Mark RC&D Executive Committee, the Team will undertake the review. At present, the ERT can undertake approximately two (2) reviews per month.

For additional information regarding the Environmental Review Team, please contact your local Soil and Water Conservation District or Nancy Ferlow, ERT Coordinator, King's Mark Environmental Review Team, King's Mark RC&D Area, 322 North Main Street, Wallingford, Connecticut 06492. King's Mark ERT phone number is 265-6695.