



**EASTERN CONNECTICUT
ENVIRONMENTAL
REVIEW TEAM
REPORT**



**Eastern Connecticut
Environmental Review Team
Report**

prepared for the

Westbrook Town Forest Commission

October 1994

Environmental Review Team Report on

**Westbrook Town Forest
Westbrook, Connecticut**

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

The ERT met and field checked the site on Tuesday, May 3, 1994. Team members participating on this review include:

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Elaine Sych

ERT Coordinator

Eastern Connecticut Resource Conservation and Development Area, Inc.

Prior to the review day, each Team member received a summary of the commission's concerns, a location map, a trail map, and a soils map. On the review day the Team members were given a trail guide and additional information. The Team met with, and were accompanied by the chairman of the Forest Commission and the town planner. Following the review, reports from each Team member were submitted to the ERT Coordinator for compilation and editing into this final report.

This report represents the Team's findings. It is not meant to compete with private consultants by providing site designs or detailed solutions to development problems. The Team does not recommend what final action should be taken on a proposed project -- all final decisions rest with the Town and landowner. This report identifies the existing resource base and evaluates its significance to the proposed development, and also suggests considerations that should be of concern to the developer and the Town. The results of this Team action are oriented toward the development of better environmental quality and the long-term economics of land use.

The Eastern Connecticut RC&D Executive Council hopes you will find this report of value and assistance in making your decisions on this town owned forest property.

If you require additional information, please contact:

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Contents

	Page
Introduction -----	1
Location Map -----	2
Topography and Geology -----	3
Topographic Map -----	6
Soil Resources -----	7
Soils Map -----	11
Wetland Resources -----	12
Watershed Map -----	15
Natural Diversity Data Base -----	16
Vegetation -----	17
Vegetation Type Map -----	20
Wildlife Resources -----	21
CEDARS brochure -----	23
"See What's Happening at CEDARS." -----	24
Archaeological Review -----	26
Outdoor Classroom Activities -----	27
Trail Map -----	30
State Park Planner Comments -----	31
Appendix -----	32
Interpretive Signing Information -----	33

Introduction

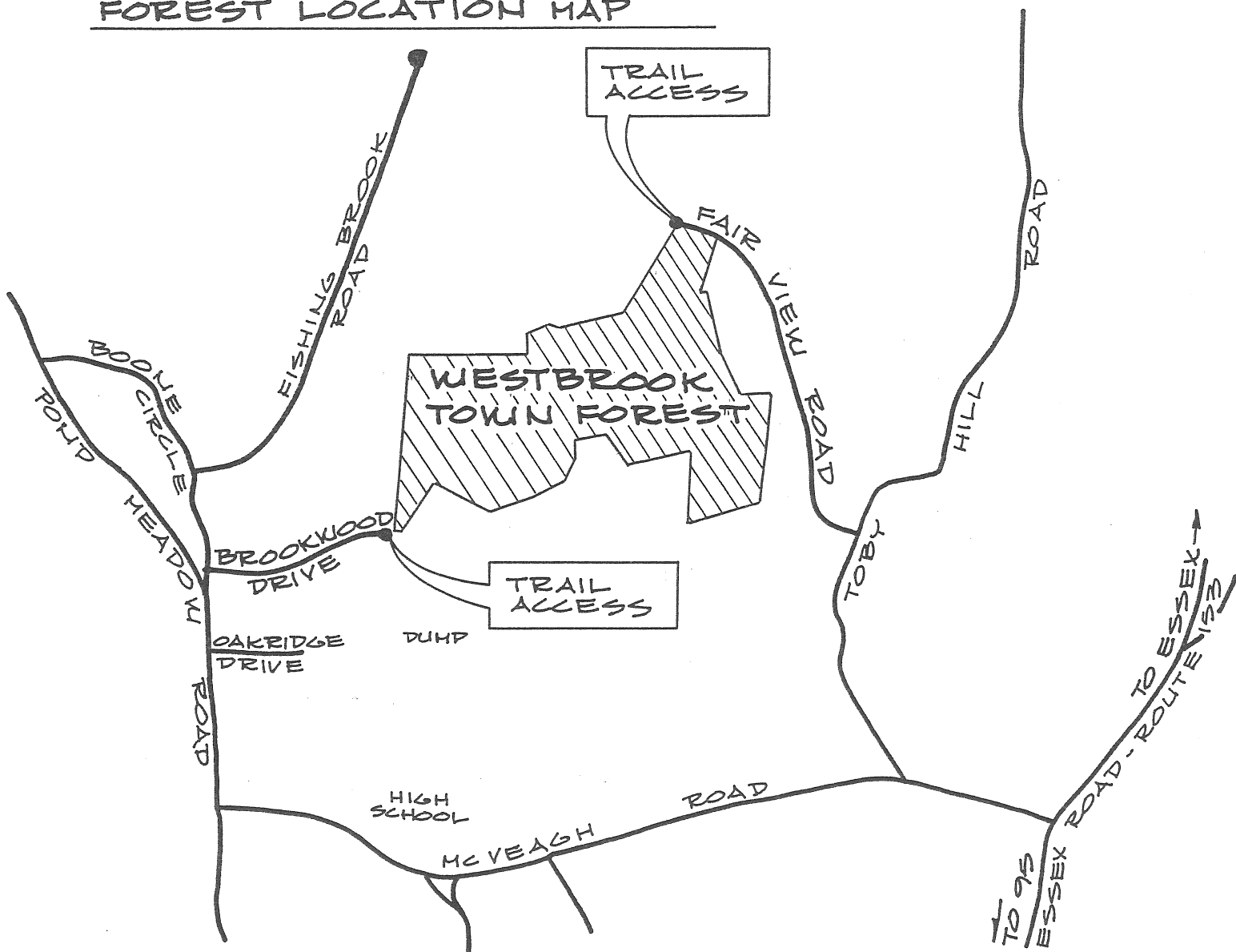
The Eastern Connecticut Environmental Review Team was asked to assist the Westbrook Town Forest Commission in conducting a natural resource inventory of the Town Forest property and to provide them with information and ideas for updating the trail guide and developing educational opportunities for the general public and school-age children.

The 55 acre site is located between Fair View Road and Brookwood Drive with access from the cul-de-sacs on each road. The site is north of the town landfill and the high school. Three marked trails have been developed, and there is an unmarked woods road. The Town Forest abuts recently developed subdivisions on the north, east and west, the town landfill, a gravel quarry and other private land to the south.

Recent efforts of the Forest Commission include trail maintenance and marking. An Eagle Scout project will be to build several wetland/stream crossings that are needed to make the trails accessible to a wider range of people. The Commission's goal is to maximize the use of the forest for enjoyment and education while managing the resources wisely.

LOCATION MAP

FOREST LOCATION MAP



Topography and Geology

The slope of the study area is in some places quite steep, with maximum slopes on the order of 12%. In general, the higher elevations coincide with bedrock outcrops. A small stream runs through the property, producing marshy areas in the flatter terrain.

Bedrock Geology

The bedrock exposed in the area of the Westbrook Town Forest is predominantly Monson Gneiss, a metamorphic rock rich in quartz and feldspar which shows predominant planes of foliation, or weakness, along which the rock tends to fracture. The Monson Gneiss is Ordovician (approximately 460 million years old) and can be found trending northward through Connecticut up through northern Massachusetts. The rocks which became the Monson Gneiss were formed under the ocean adjacent to a volcanic island arc off the coast of Africa. North America and Northern Africa were converging at that time, producing earthquakes and volcanic eruptions similar to those on the east Pacific Rim today.

When North America and North Africa collided about 250 million years ago, a large mountain belt formed, now called the Appalachians. Remnants of the island arc are now plastered onto Rhode Island and the eastern part of Connecticut as a result of that collision. (Avery Point in Groton is a good example of the rocks forming the old island arc.) During the collision, large folds occurred in the rocks which had been under water. The Westbrook Town Forest is located on the southern end of one of these large folds, called the Monson Anticline. The Monson Anticline extends up through Massachusetts, where it is called the Bronson Anticlinorium. In the immediate vicinity of Westbrook, there is a dome structure called the Killingworth Dome and a small basin structure called the Vincent Pond Basin. These also were formed as part of the large-scale deformation of the crust during the formation of the Appalachians.

Since these events, of course, North America has split off from North Africa again, and the Appalachians have largely eroded, leaving at the present-day surface rocks that used to be buried deep in the earth's crust. The present-day hills are actually the result of tilting of rocks along the eastern seaboard, not the worn-down nubbins of an old mountain range. The shapes that the hills take, however, are still largely controlled by the structures formed in those mountain-building events millions of years ago.

Surficial Geology

During the glacial age, 15,000 years ago, coastal Connecticut was the southern terminus of a glacier that was beginning to retreat. The actual seashore at that time was nowhere near southern Connecticut, because so much of the water of the world was bound up in continental ice sheets that the sea level was lower than it is today. Glacial meltwater gathered in channels and deposited the rock debris that had been scoured from the landscape. Just south of the study area is a large deposit of ice-contact stratified drift, material deposited by glacial meltwaters in close proximity to the ice. The gravel quarries south of the study area are mining those glacial deposits. The actual study area is predominantly covered by thin glacial till, material deposited directly by the ice as it melted, not sorted by meltwater. There is no evidence of drumlin formation. (A drumlin is a streamlined hill formed predominantly of glacial till.) Some of the large boulders evident near the rock outcroppings may be glacial erratics. Most appear to have eroded in place, and were not transported great distances by the ice.

Recommended Strategies

If the town wishes to prepare a guidebook on the geology of the town forest, it is probably not necessary to include all the detail mentioned in this report. There are several locations in the forest where a signpost showing geological features might be appropriate. In several places it is evident that the rock fractures are controlled by cleavage of the gneiss. It may be possible to post a sign with a drawing that will display this feature to the general public. A likely glacial erratic can be identified and marked by a sign, although the Team geologist, personally, would not identify any individual rock she saw as an erratic without a closer look. There is a location where it is possible to see the gravel quarry without leaving the trail. A sign identifying this as glacial outwash might be appropriate, although trespassing should be discouraged. Any booklet published could contain a brief overview of the geology. Anything that is printed or posted should be reviewed by a geologist for accuracy, since it is possible to give misleading information by summarizing. The Team geologist would be happy to assist at a further stage in this process if local expertise is not available.

References

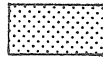
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TOPOGRAPHIC MAP



Scale 1" = 2000'



Approximate Site



Soil Resources

The soils within the Town Forest include: Charlton-Hollis (CrC), Hinckley (HkC), Hollis-Charlton (HpE), and Leicester, Ridgbury, Whitman (LG). These soils, which are identified within the Soil Survey of Middlesex County (1979), are described below:

SOIL MAP SYMBOL	DESCRIPTION
CrC	<p>CHARLTON-HOLLIS VERY STONY FINE SANDY LOAMS, 3 TO 15 PERCENT SLOPES. This map unit consists of very deep and shallow gently sloping to sloping, well drained and somewhat excessively drained soils on hills and ridges of glacial till uplands. The areas of this map unit are mostly irregular in shape. Slopes are mostly complex and 100 to 200 feet long. Stones cover 1 to 8 percent of the surface, which is marked by a few narrow, intermittent drainage-ways and small, wet depressions. This map unit is about 55 percent Charlton soils, 20 percent Hollis soils, 15 percent other soils, and 10 percent exposed bedrock. The Charlton and Hollis soils are in a such a complex pattern that it was not practical to map them separately. The water table in this unit is commonly at a depth of more than six feet. The available water capacity is moderate in the Charlton soils and very low or low in the Hollis soils. Both soils have moderate or moderately rapid permeability and medium to rapid runoff. Hard unweathered schist bedrock is a depth of 14 inches in some areas. Limitations for recreational development are stoniness, slope, and depth to rock.</p>
HkC	<p>HINKLEY GRAVELLY SANDY LOAM, 3 TO 15 PERCENT SLOPES. This rolling, excessively drained soil formed in sandy and gravelly water-sorted materials. It is on terraces of stream valleys, outwash plains, kames and eskers. Bedrock is commonly more than 60 inches below the surface. The water table is commonly below a depth of six feet. Permeability is rapid in the surface layer and subsoil, and very rapid in the substratum. Surface runoff is slow and the available water capacity is low. Limitations for recreational development are excess sand, and small stones.</p>
HpE	<p>HOLLIS-CHARLTON EXTREMELY STONY FINE SANDY LOAMS, 15 TO 40 PERCENT SLOPES. This map unit consists of very deep and shallow moderately steep to steep, well drained and somewhat excessively drained soils on hills and ridges of glacial till uplands. Areas of this map unit are mostly long and narrow or oval in shape. Slopes are mainly convex and 100 to 500 feet long. Stones and boulders cover 1 to 8 percent of the surface. This map unit is about 55 percent Charlton soils, 20 percent Hollis soils, 15 percent other soils, and 10 percent exposed bedrock. The Charlton and Hollis soils are in such a complex pattern that it was not practical to map them separately. The water table in this map unit is commonly at a depth of more than 6 feet. The available water capacity is moderate in the Charlton soils and very low or low in the Hollis soils. Both soils have moderate or</p>

moderately rapid permeability and medium to rapid runoff. Hard unweathered schist bedrock is at a depth of 14 inches in some areas. Limitations for recreation development are stoniness, slope, and depth to rock.

LG LEICESTER, RIDGEBURY, AND WHITMAN EXTREMELY STONY FINE SANDY LOAMS. These nearly level, poorly drained and very poorly drained soils formed in compact and friable loamy glacial till. They are in depressions and drainage ways of glacial till uplands. Depth to bedrock is commonly more than 60 inches below the surface. From 8 to 25 percent of the surface of these soils are covered with stones and boulders. The soils were mapped together because they have no significant differences in use and management. These soils have a seasonal high water table at or near the surface from fall through spring. Permeability is moderate or moderately rapid in the surface layer and subsoils of these soils. The permeability is slow to very slow in the substratum of the Ridgebury and Whitman soils and moderately rapid in the substratum of the Leicester soils. Runoff is slow. The available water capacity is moderate in these soils. LG is a wetland soil. Limitations for recreational development are stoniness and wetness.

Recreational Development Recommendations

The limitations identified above which may be associated with recreational development do not necessarily preclude development. The following recommendations will address the limitations and provide guidance to minimize disturbance to the soil resources during the planning and implementation process.

DEPTH TO ROCK: The limitation for CrC is MODERATE and HpE is SEVERE. In some areas, the depth to bedrock may be within 3 - 6 inches below the soil surface or exposed on the surface. While bedrock may provide a firm base for recreational development, such as trails and vista areas, it may create other problems such as placement of trail signs or safety concerns during wet periods. Wood chips or bark may be used to protect areas where the soil depth is quite shallow over bedrock, soil disturbance is near bedrock, or both. Where feasible, it is recommended to accomplish recreational development in CrC over HpE.

EXCESS SAND: The limitation for HkC is MODERATE. In some areas, sand may present some problems in recreational development, such as the establishment of a stable footing for trail railings, signs and benches. The addition of gravel or small stone and soil fill will help to firm up any unstable sandy areas.

SLOPE: The limitation for CrC is MODERATE and HpE is SEVERE. Soil erosion, safety and general recreational planning concerns, such as trail location, are greater on steep slopes (greater than 8 percent) compared to gentle slopes (less than 8 percent) or level ground. To address these concerns and minimize damage to the natural resources, locate a trail across the slope rather than up and down the slope. Overall, the existing trails appear to be stable and in good condition. Where feasible, it is recommended to accomplish recreational development in CrC over HpE.

SMALL STONES: The limitations for HkC is MODERATE. Stones less than 6 inch diameter fit this category. When planning for recreational development, such as trails, leave small stones in place, unless they pose a safety hazard to pedestrians. If stones are removed on steep slopes, follow the recommendations in the section STONINESS.

STONINESS: The limitation for CrC is MODERATE, HpE is SEVERE, and LG is SEVERE. The main concern with disturbing or removing large stones (greater than 6 inch diameter) for recreational development, such as trail location, especially on moderate to steep slopes, is soil erosion. Leaving large stones in place will help to keep erosion to a minimum. If stones are removed the following recommendations will help to address soil erosion: Stable, natural ground is recommended to maximize trail location and development, reduce maintenance, and to help keep soil erosion at a minimum. If possible, incorporate existing trails or roadways into the overall trail system. However, areas showing signs of soil erosion may be stabilized by either replacing natural vegetation or using alternative materials such as wood chips or bark. Where feasible, it is recommended to accomplish recreational development in CrC over HpE and LG.

WETNESS: The limitation for LG is SEVERE. However, if the area is developed for recreational use, such as trails or picnic areas, limit development to during the summer. This represents a time of year when water tables are traditionally at their lowest and will help to minimize disturbance to the soil resources. Avoid areas which may pond water, areas which traditionally pond water, or both. Limit use to pedestrians only; equestrian or motorized used will increase maintenance, safety concerns, and soil disturbance. Where feasible, place materials, such as wood chips, or geotextile material and stone, in high use areas (trails, picnic areas, benches) to minimize soil disturbance and erosion. It is recommended to consult with a specialist in trail development to obtain additional information regarding materials, safety concerns, etc.

ADDITIONAL AREAS OF CONCERN: Small tree trunks, 1 to 3 inches in diameter, were observed above ground throughout the existing trail system. This represents a **SEVERE** safety hazard to pedestrians, especially the very young and elderly. It is recommended that these trunks be removed, flush with natural ground, and fill in disturbed areas with soil, wood chips, or both.

Summary

Limitations for recreational development within the Town Forest include: depth to rock, excess sand, slope, small stones, stoniness, and wetness. These limitations do not preclude development, but require careful consideration during the planning process to minimize disturbance to the soil resources in particular and the total natural resources in general. It is recommended that recreational development be limited to pedestrian traffic only, and in soils with **MODERATE** limitations before development in soils with **SEVERE** limitations. Overall, the area covered within the ERT study appears to be stable and in good condition; existing small tree trunks in the trails represent a safety hazard and should be removed as soon as possible. A consultation with a recreation specialist is recommended to maximize the use of this area.

Wetland Resources

Specific concerns addressed in this section are wetland types, interaction of wetlands with trail development and relationship of wetlands to the watershed and its water quality.

Wetland Types

The wetlands on this site can generally be classified as broadleaved deciduous, forested wetlands. Approximately 10 of the 55 acres of this property are inland wetlands. They exist mainly in the western and central portions of the Town Forest. They are primarily undisturbed and accept water from a largely unpopulated watershed. The western wetland area is a depression type of wetland existing at the bottom of a topographic bowl which outlets through a gravel extraction area and eventually to McVeagh Pond. An unnamed watercourse flows through the central wetland area of the Town Forest flowing from north to the south, and it also drains into McVeagh Pond. Some of the vegetation observed in these wetlands include red maple, yellow birch, black ash, spice bush, winterberry, false hellebore, skunk cabbage, marsh marigold, tussock sedges, cinnamon and sensitive ferns, trillium and jack-in-the-pulpit.

Interaction of Wetlands with Trail Development

The Town recognizes that the current size of the Town Forest precludes any new trail development and that their focus should be the improvement of the existing trail system. The only other area that could possibly support a new trail loop is the northwestern section, however, the steep, rocky terrain may prohibit this. Another opportunity for new trail development would be the construction of short, raised side trails that veer off of the main trail and lead to a small observation platform within a particularly diverse, attractive wetland area. The wetland area just east of the high ledge may be suitable for this.

At this time there are no constructed crossings through wetlands. Constructed wetland crossings are recommended to provide safe travel and to eliminate potential impact to the wetlands caused by repeated crossings. One critical crossing will be over the unnamed watercourse in the north-central portion of the site. It is a very attractive portion of the watercourse where concentrated flow cascades down around large boulders. It may be

difficult to build a safe crossing where the trail currently crosses the brook due to the existence of these large rocks and boulders. A crossing on flatter, less rocky ground, just downstream of this location may be advisable. Another critical wetland crossing will be the braided section of the watercourse in the south-central portion of the Town Forest where the main brook widens as it breaks up into several smaller parallel brooks that join again downstream. The trail appears to cross at the widest part of the braided section. It may be less expensive to relocate the trail to a narrower section of the wetland just upstream of this location in order to reduce the overall length of the constructed wetland crossing which is recommended for this crossing.

The construction methods used for stream and wetland crossings can vary greatly depending on the expected water levels, condition of the substrate, available materials, the length of the crossing and the amount of disturbance that can be tolerated. A good reference for wetland crossings and trail construction in general is *Appalachian Mountain Club's Trail Building and Maintenance* (Proudman and Rajala, 1981). Any plans for constructed wetland crossings should be reviewed by your local Inland Wetlands Agency before proceeding.

Relationship of Wetland to Watershed and Water Quality

This wetland system exists in the Patchogue River Watershed of the South Central Eastern Regional Complex located within the South Central Coast Major Basin (see Watershed Map). The watershed directly upstream from the wetlands of the Town Forest extends to the north for approximately one mile and contains about 280 acres. As mentioned earlier, the land-use within the watershed is largely undeveloped, forested with a small number of single-family homes. Because of the undisturbed nature of the upstream watershed, water quality within the Town Forest should be excellent. The unnamed watercourse that leaves the Town Forest joins with Spring Lot Brook and later with Trout Brook to form the Patchogue River which flows into the Long Island Sound.

In the Westbrook Conservation Commission's trail guide for the Town Forest, a description of the wetland stop (station 15) generally mentions several valuable functions of inland wetlands, including water storage, flood control, water purification and diverse habitat. It is agreed that these seem to be the most critical functions served by this wetland, however, if more space is available in future editions of this trail guide, it would be advised to expand on this discussion by relating these functions directly to conditions

present in and around the wetlands of the Town Forest.

For example, explain the concept of a watershed and that a short distance downstream of this wetland, in the same watershed, is a public water supply well (CT Water Co., Guilford-Chester Division, Westbrook Well) which supplies thousands of people with water for drinking, bathing etc. Further explain that land use changes within a watershed can effect the quality of water coming from wells like these and that natural wetland plants and soil, like those found in the Town Forest, act to cleanse certain types of pollution generated as a result of land-use changes within the watershed.

The Natural Diversity Data Base

The Natural Diversity Data Base maps and files regarding the study area have been reviewed. According to our information, there are no known extant populations of Federal or State Endangered, Threatened or Special Concern Species occurring at the site in question.

Natural Diversity Data Base information includes all information regarding critical biologic resources available to us at the time of the request. This information is a compilation of data collected over the years by the Natural Resources Center's Geological and Natural History Survey and cooperating units of DEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site specific field investigations. 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 species and locations of habitats of concern, as well as enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

Please contact the Data Base if you have any questions regarding this information (566-3540). Thank you for consulting the Natural Diversity Data Base. Also be advised that this is a preliminary review and not a final determination. A more detailed review may be conducted as part of any subsequent environmental permit applications submitted to DEP for the proposed site.

Vegetation

The 55 acre Westbrook Town Forest property has excellent potential for the environmental education of all ages. The vegetation present on this tract of land falls into three broad categories. These include Mixed Hardwoods, Hardwood Swamp/Inland Wetland and Oak Ridge (see Vegetation Type Map). The location and acreage of these areas were obtained from aerial photographs and are only approximate.

A. Mixed Hardwoods: The Mixed Hardwood type totals approximately 46 acres and is made up of reasonably healthy small sawtimber size trees (11.1" in diameter at breast height (d.b.h.) and larger) and pole size trees (6.1" to 11" d.b.h.) 60 to 100 years of age. Black oak, red oak, black birch and red maple are the dominant overstory tree species. White oak, scarlet oak, mockernut hickory, pignut hickory, and shagbark hickory are present throughout, along with scattered American beech. Tulip tree, sugar maple, sassafras, white ash and yellow birch are intermixed in the valleys and near the wetlands. Understory vegetation includes hardwood tree seedlings, maple leaved viburnum, eastern hophornbeam, American hornbeam, azalea, beaked hazelnut, American chestnut sprouts, witch-hazel, highbush blueberry, lowbush blueberry and huckleberry. Ground cover vegetation includes poison ivy, Virginia creeper, green briar, raspberry, dewberry, Canada mayflower, Indian cucumber, false soloman's-seal, wild sarsaparilla, club moss, evergreen wood fern, hayscented fern, cinnamon fern, Christmas fern, rock polypody and many species of grasses, sedges and wild flowers.

B. Hardwood Swamp/Inland Wetland. There are approximately 5 acres of Hardwood Swamp/Inland Wetland present within this property. These wetland areas are somewhat variable with all size classes and age classes of trees represented. Each wetland is dominated by red maple with occasional black gum, white ash, yellow birch and occasional tulip tree intermixed. Swamp white oak was noted in the nature trail guide as being present, however it was not observed during the field investigation. A few of the larger trees in these wetland areas have cavities which make excellent den sites for many species of wildlife. Understory vegetation includes spice bush, sweet pepperbush, highbush blueberry, swamp azalea, arrowwood, winterberry, swamp rose, and speckled alder. Skunk cabbage, false hellebore, tussock sedge, club moss, horsetail, sphagnum moss, poison ivy, green briar, cinnamon fern, Christmas fern, sensitive fern, steeplebush, wild geranium, marsh marigold, penny royal, Canada mayflower, rue anemone, wood anemone, solomon's-seal, false solomon's-seal, spotted wintergreen, trillium, violets,

cinquefoil, Jack-in-the pulpit and other wild flower species are present as ground cover.

C. Oak Ridge. The excessively drained shallow to bedrock knolls that are present total approximately 4 acres. The vegetation which dominates these sites is made up of somewhat stunted and malformed pole sized chestnut oak, scarlet oak, white oak, and black oak with scattered mockernut hickory and pignut hickory. Red maple, black birch and sassafras are also present in the overstory, but in lesser numbers. Understory vegetation includes hardwood tree seedlings, choke cherry, witchhazel, maple leaved viburnum, Lowbush blueberry, huckleberry and green briar. Ground cover consists of Pennsylvania sedge, Canada mayflower, pink lady's-slipper, club moss, poison ivy, Virginia creeper, hayscented fern and bracken fern.

Limiting Conditions and Potential Hazards

Currently there are several conditions which limit the health and vigor of the trees on this property. One condition is the saturated soils that created the hardwood swamp areas and the wetland areas. The high water tables in these areas restrict the depth of root development, limiting the stability and therefore the size trees can attain. Trees in these areas are usually slow growing and very susceptible to windthrow. Another condition that limits the potential for tree health and vigor are the droughty shallow to bedrock soils located on the oak ridge knolls. The trees in these areas are somewhat stunted in growth and malformed in appearance due to the lack of moisture and shallow soils. Insect infestations, specifically the Woolly Beech Blight Aphid and various insects which attack oak such as the Gypsy moth and the Two Lined Chestnut Borer which are present on the property may cause a decline in health and even mortality in their host species. Nectria canker is abundant on the black birch throughout this property. This canker can girdle and even kill young trees or make them subject to wind breakage.

Potential hazards on this property relating to the vegetation include poison ivy and trees that have a high risk of injuring people that are utilizing the property. Trees with their roots exposed, dead trees, dead tree parts and those trees which have a high probability of falling due to excessive decay or lean would be considered hazardous, especially if located near areas of high use such as the hiking trails and woods roads.

Management Considerations

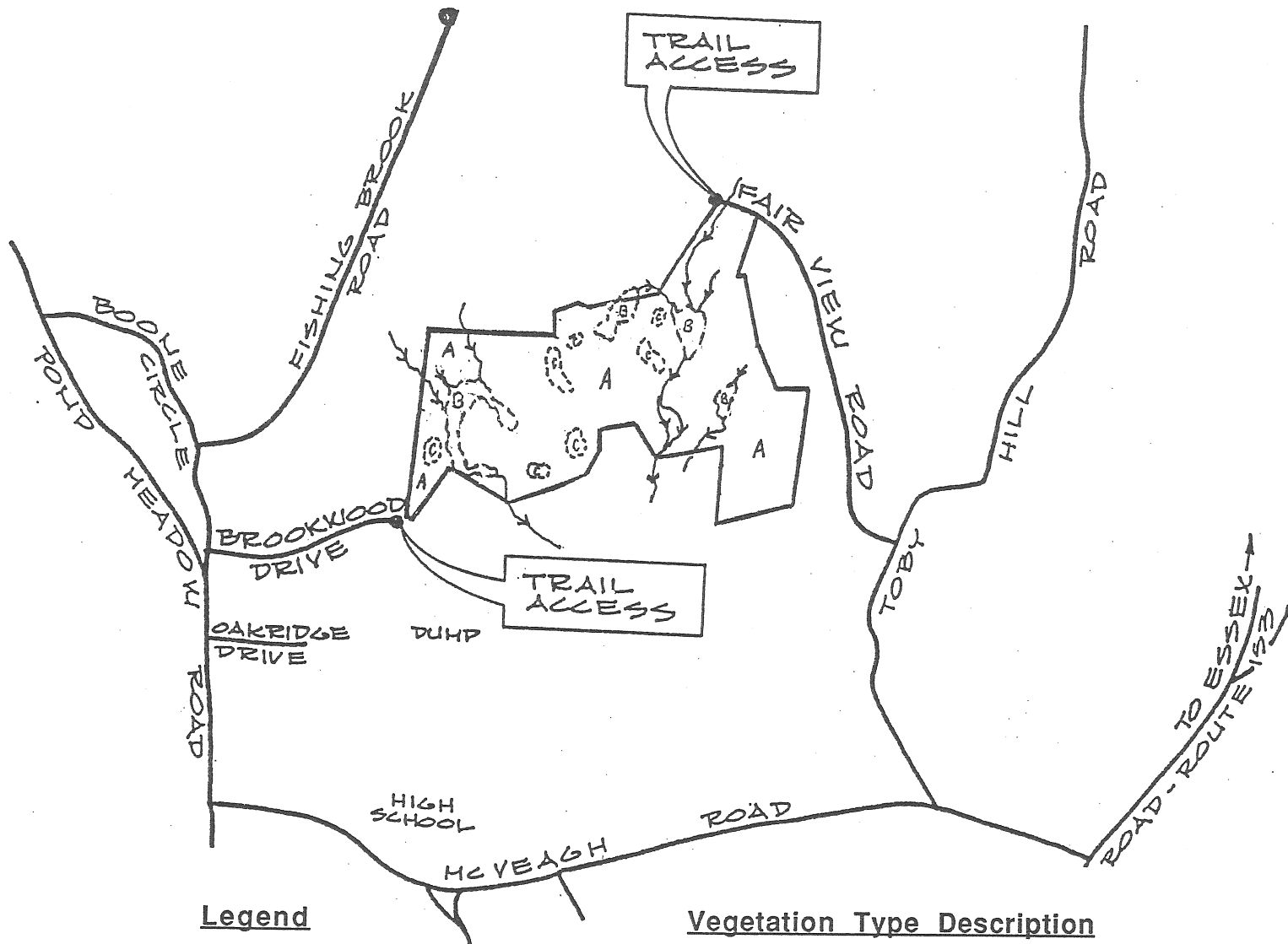
The removal of risk and hazard trees and the maintenance of healthy vigorous trees which are less likely to be adversely affected by insect and disease infestation should be of major concern in the management of this property. Where accessible improvement thinnings focused on the removal of unhealthy damaged trees which are competing with trees of high potential could be implemented within the mixed hardwood area. The effect of these thinnings if properly administered could be used for the purpose of educational demonstration especially if non-managed control areas are set aside for comparison. An experienced professional forester should be retained to determine which trees are hazardous to life and property, which trees should be retained as standards for their aesthetic appeal and which trees should be removed to maintain the overall health of the forest.

As this property has excellent potential for educational purposes, the Department Of Environmental Protection's Division of Environmental Education (Diane Joy at 424-3599) should be contacted. Project Learning Tree, Project Wild and Project WET are administered by this office and are excellent environmental education tools tailored to all levels.

VEGETATION TYPE MAP



Scale 1" = 1000'



Legend

- Road
- Property Boundary
- Vegetation Type Boundary
- Stream

Vegetation Type Description

- A. Mixed Hardwoods - ±46 acres
Fully -stocked, pole to sawtimber size.
- B. Hardwood Swamp - ±5 acres
Fully-stocked, all size classes.
- C. Oak Ridge - ±4 acres
Under-stocked, sappling to pole size.

Seedling Size - Trees less than 1" in diameter at 4 1/2 feet above the ground (D. B. H.)

Sapling Size - Trees 1" to 5" in D.B.H.

Pole Size - Trees 5" to 11" in D.B.H.

Sawtimber Size - Trees 11" and greater in D.B.H.

Wildlife Resources

The Westbrook Town Forest offers the potential to be a place for learning the basics of wildlife habitat and wildlife management techniques. The 55 acre property is a typical mixed hardwood forest interspersed with inland wetlands and an oak/hickory upland ridge. Field inspection, which was limited to an initial trail hike for two hours and a subsequent systematic walk (3 hours) utilizing north-south transects, revealed that the forest has common forest-dwelling wildlife. Wildlife encountered or indirectly accounted for during field visits include: deer, raccoon, gray squirrel, pileated woodpecker, northern flicker, blue jay, hermit thrush, wood thrush, ovenbird, bluejay, and eastern toad. Further field inspections are needed to ascertain the seasonal use of the forest by wildlife.

Educational Opportunities

Wildlife habitat is represented by the collective summation of all the environmental factors that occur at a given location such as the food, water, cover and their spatial arrangement. Educating the public in what the needs of wildlife are and what types of wildlife occur in their town can help them understand the function of habitat and the importance of habitat to the existence of wildlife. Interpretive signs and a printed trail guide can be used to point out the various forest components that provide food sources and structural habitats for wildlife.

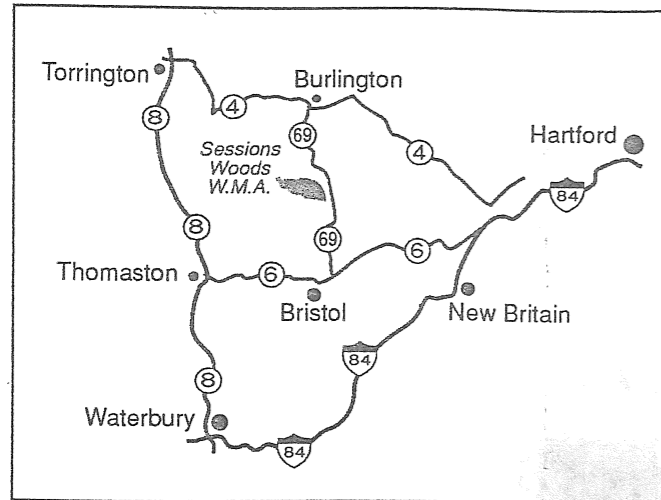
There are many types of habitat management techniques which can be implemented to enhance the forest for desired wildlife species. Management techniques require planning with goals and objectives which are developed following consultation with a wildlife biologist, forester, and/or other natural resource professional. Some techniques, such as nest box placement, can easily be implemented. More demanding techniques, such as developing temporary wildlife openings or forest thinnings, need more planning and assessment.

The Department of Environmental Protection's Wildlife Division can provide some technical assistance. The Wildlife Division has a field demonstration area in Burlington, Connecticut called Sessions Woods Wildlife Management Area. The area includes an educational facility and field demonstration sites (project CEDARS, see following brochure and article). It is recommended that the Westbrook Forest Commission and other appropriate town staff make an appointment to visit the site and gain insight into

what can be done to manage habitat for wildlife.

The Westbrook Town Forest has a great potential for implementing creative educational opportunities for the general public to learn about wildlife and its habitat.

Further assistance from the Team Urban Wildlife Biologist is available upon request. (Contact Pete Picone at 584-9839).



CEDARS

Wildlife Conservation Education,
Demonstration And Recreation Site
Burlington, Connecticut

For More Information:

CEDARS is located at the Sessions Woods Wildlife Management Area in Burlington, Connecticut, on Route 69, approximately 3 miles south of Route 4 in Burlington and approximately 3 miles north of Route 6 in Bristol. For more information about features, activities and programs at CEDARS, contact the Wildlife Division at:

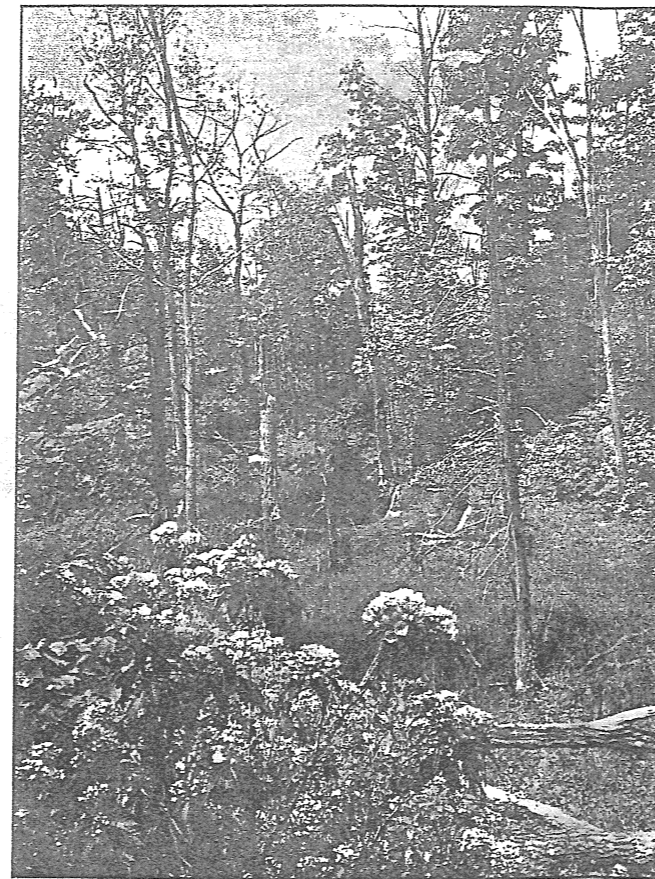
CEDARS
P.O. Box 1550
Burlington, CT 06013
(203) 584-0922



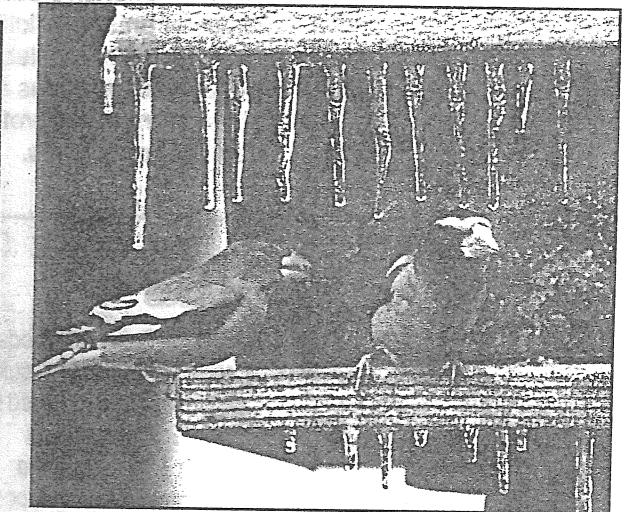
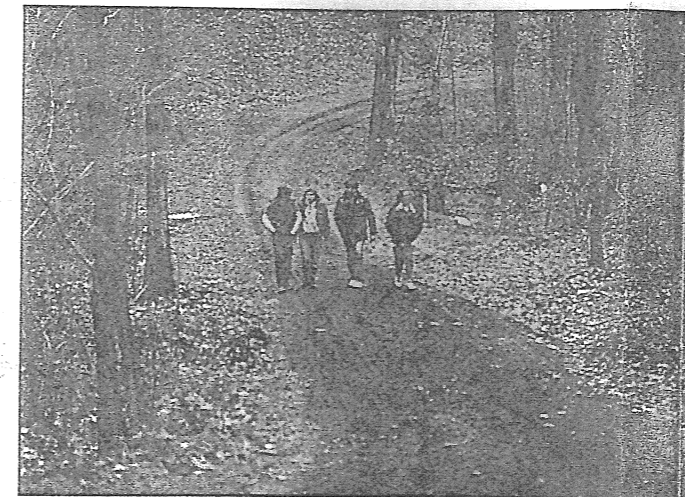
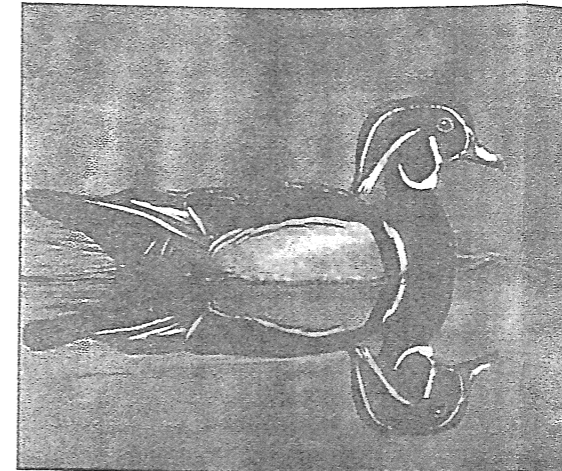
Graphic Design/Photography by Paul J. Fusco
Wood Duck photo by Steven D. Faccio

Wildlife Division Publication No. PA-4

Printed on Recycled Paper



State of Connecticut
Department of Environmental Protection
Wildlife Division



Conserving Connecticut's Wildlife Heritage

The biggest threat facing Connecticut's wildlife species is the loss of habitat. As more land is developed, there is less land that wildlife can call home. Because more than 90 percent of our state's acreage is privately owned, both large and small landowners, as well as all Connecticut citizens, must play a critical role in Connecticut's wildlife conservation efforts. To meet this need, the Wildlife Division established CEDARS, a conservation education, demonstration and recreation site, at the Sessions Woods Wildlife Management Area in Burlington.

Visitors to CEDARS will be introduced to wildlife habitat management practices and principles through various activities, exhibits, programs, guided trails and publications. CEDARS is unique because of its emphasis on wildlife management; not only will visitors develop a better understanding of the Wildlife Division's role in managing Connecticut's wildlife populations, they will also learn how to help wildlife by improving habitat on their property. The goal of CEDARS is to foster a better understanding and respect for wildlife and natural resources.

The Focus of CEDARS

CEDARS focuses on conservation education, with facilities to bring school groups, the general public and natural resource professionals from throughout Connecticut and the region to participate in educational programs, demonstrations and workshops pertaining to wildlife and the natural resources management. These facilities include an education center with an exhibit area and a large multi-purpose room, as well as trails, demonstration areas, habitat management projects, a backyard wildlife area and overnight lodging. CEDARS goes beyond the traditional nature center concept by offering a comprehensive education program that uses the expertise of on-site Wildlife Division biologists. These biologists are available, by appointment, to conduct educational programs at the center and to give technical assistance and professional advice to visitors on an individual basis.

History of CEDARS

The property that is now home to the Sessions Woods Wildlife Management Area and CEDARS was acquired by the Sessions family in 1923 and later purchased by the United Methodist Church in 1957 for use as a summer camp. When the church was considering selling the land to a developer, local residents opposed the housing subdivision, even though part of the acreage was to be set aside in a land trust nature reserve. At that time, the State of Connecticut became actively involved in acquiring the property as a wildlife management area. In 1981, the church offered to sell the 455-acre area to the State with the agreement that the site be used for a wildlife conservation education center. The purchase was made using sportsmen-generated Federal Aid in Wildlife Restoration funds and matching gift credits; there was no cost to Connecticut taxpayers. After 10 years of evaluation and planning, development of CEDARS began in 1991, demonstrating the State's commitment to this long-term venture.

Some of the features that make CEDARS unique as a wildlife conservation education center include ...

EDUCATION

Programs on wildlife management and other natural history subjects are available.

- School programs
- Guided hikes and tours
- Slide presentations, workshops and other programs for the general public
- Project WILD Workshop for teachers
- Professional natural resource workshops, seminars and technical meetings

Exhibits and Displays

- Wildlife photographs and artwork
- Special program displays
- Mounted wildlife specimens

Publications and Educational Materials

- Wildlife Informational Series
- Newsletters
- Trail guides, maps, brochures
- Wildlife checklist

DEMONSTRATION

Designated locations illustrate habitat management techniques that private landowners and commercial businesses can use to enhance their property for wildlife.

- Wildlife food and cover plantings
- Snag and den tree management
- Water impoundments and control structures
- Stream improvements
- Forest openings for wildlife
- Control of nuisance wildlife

Backyard Wildlife Habitat Area

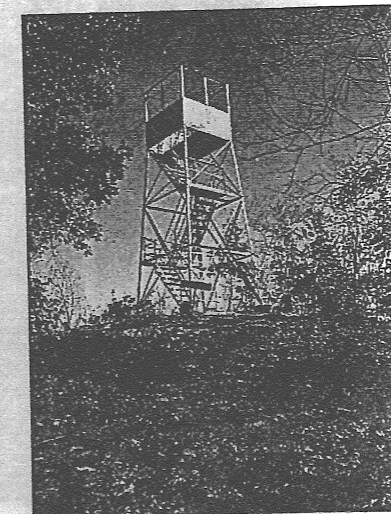
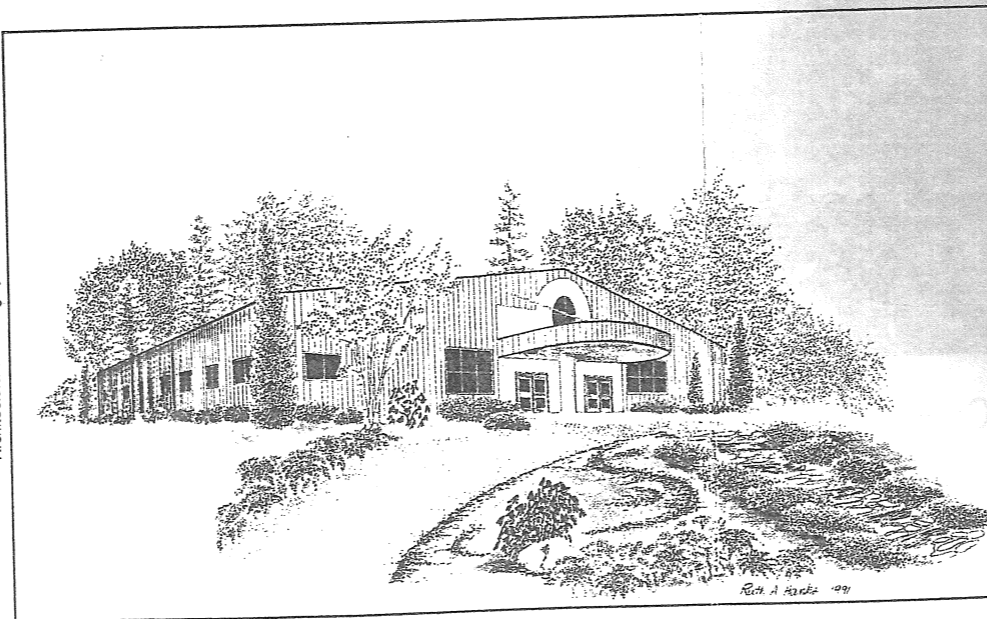
- Songbird nestboxes and feeders
- Wildlife plantings
- Wetland management demonstration
- Wildlife viewing building with display

RECREATION

Sessions Woods Wildlife Management Area offers excellent opportunities throughout the year for hiking, birdwatching, photography, cross-country skiing and other outdoor activities.

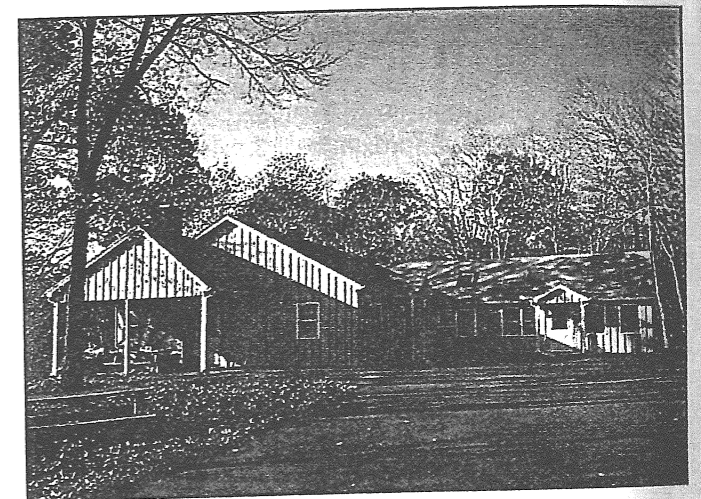
- Hiking trails
- Wildlife observation opportunities and photography blinds
- Identification of native plants and wildflowers
- Scenic view of a 38-acre marsh
- A cascading waterfall along Negro Hill Brook
- Scenic overlook from a 25-foot observation tower

Architectural rendering by Ruth Hanks of West Hartford, CT



One of Connecticut's last remaining fire towers has been relocated to the highest point on the property where visitors can view distant landscapes.

The focal point of CEDARS is the center (left) where there is an exhibit area, a large multi-purpose room and offices for Wildlife Division staff.



An overnight lodge is located on-site to provide accommodations for up to 36 people who attend weekend or multi-day seminars, workshops and technical training sessions.

Wildlife for the Future

The future of Connecticut's wildlife resources depends largely on citizens involvement and concern. The educational and demonstration features of CEDARS encourage public awareness, understanding and enjoyment of wildlife. Please join the Connecticut Wildlife Division in meeting the challenge of wildlife conservation and management.

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Connecticut Wildlife

July / August 1994
Vol. 14, No. 4

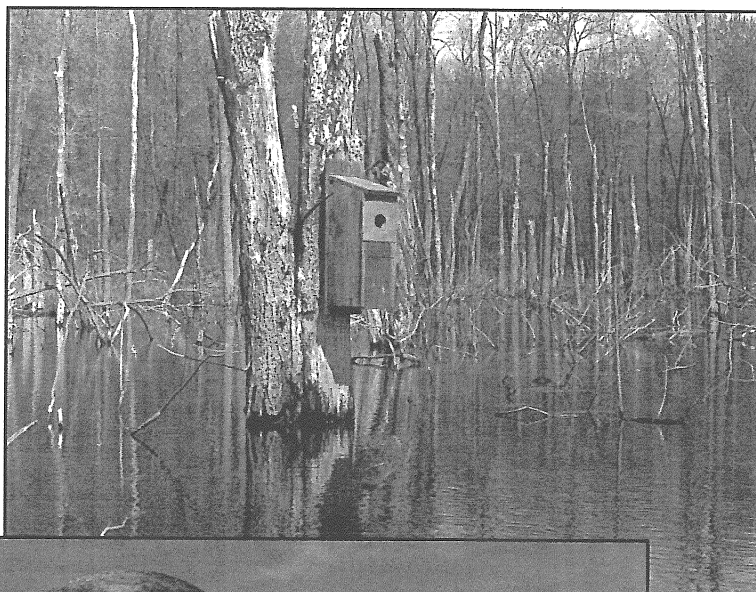
PUBLISHED BY THE CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF NATURAL RESOURCES • WILDLIFE DIVISION

See What's Happening at CEDARS

Sessions Woods Wildlife Management Area, located in a quiet, wooded area of Burlington, is much more than just a tract of natural land set aside for wildlife. It is also a Conservation Education, Demonstration, and Recreation Site (CEDARS), the culmination of years of planning and preparation by the DEP Wildlife Division. The 455-acre property was acquired by the State in 1981 using Federal Aid in Wildlife Restoration Act funds and matching gift credits. Prior to state acquisition, the property was used as a summer camp by the United Methodist Church. In 1957, the church had purchased the land from the Sessions family, who as a condition of sale required that the land be maintained in its natural state, an important consideration when the church subsequently sold the land to the state for use as a conservation education complex.

The CEDARS Center, which presently serves as a field office for the Wildlife Division, was built in 1991. The focus of CEDARS is to present a variety of educational programs, demonstration sites, self-guided hiking trails, and displays to provide practical information about wildlife and natural resources management. It is hoped that visitors will develop an understanding of the types of things they can do to have a positive impact on the future of Connecticut's wildlife and other natural resources. Sound wildlife management practices can do much to compensate for the loss of habitat which threatens Connecticut's wildlife. Because more than 90 percent of our state is privately owned, all of Connecticut's landowners play a critical role in wildlife conservation efforts.

CEDARS educational programs and displays will be expanded as resources become available. Currently, two self-guided trails and a backyard habitat demonstration area are open for public viewing. These trails, the first of their kind in Connecticut, demonstrate wildlife habitat management techniques which private landowners, municipalities, schools, commercial businesses, and others can use to enhance their properties for wildlife. Along the



The use of wood duck nest boxes, as well as other wildlife management techniques, can be seen at CEDARS.

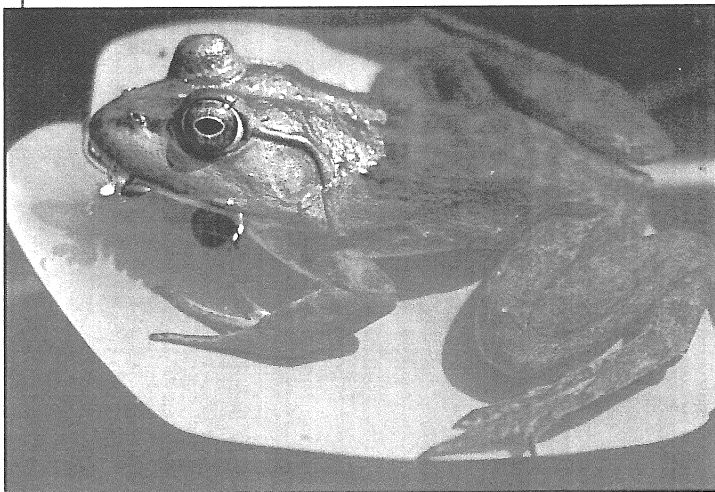


The Beaver Dam Trail leads to a large marsh where Canada geese nest on top of a beaver lodge.

use to enhance their properties for wildlife. Along the trails, signs explain the wildlife values of the nearly 80 demonstrations of land use practices affecting wildlife. Trail brochures are available at the beginning of each trail.

Beaver Dam Trail

This three-mile loop along a gravel roadway starts and ends at the main parking area. Demonstrations along the trail, and the paths which lead from it, include wildlife food and cover plantings, a clearcut, water control structures, a solar-powered electric deer fence around an orchard, forest openings, and a vernal pool. A vernal pool is a temporary body of water, usually filled by spring rains, which provides important breeding habitat for some reptiles and amphibians. The trail ascends to a 38-acre marsh with a beaver dam, then past a 25-foot observation tower and a path which leads to a waterfall. Most of the demonstration sites show wildlife management practices for large tracts of land such as state and private forests,



Bullfrogs make use of the small pond in the Backyard Habitat Demonstration Area.

parcs, wildlife management areas or commercial properties, but many also apply to smaller ownerships.

Deer Sign Trail

Although only about a half-mile in length, this trail has a number of interesting exhibits. Among the wildlife management techniques depicted are an electric deer fence around a wooded area, a bat shelter which can accommodate up to 300 bats, artificial tree cavities, and plantings of shrubs which benefit wildlife. Plantings, both with and without deer-proof wire fences around them, demonstrate the impact deer can have on vegetation. Tracks left by wildlife in a specially created tracking pit document the many animal species found in the area. Most of this trail's demonstration sites show wildlife management practices for small land tracts of one to five acres; however, many practices can be used on larger tracts or in backyards.

Backyard Habitat Demonstration Area

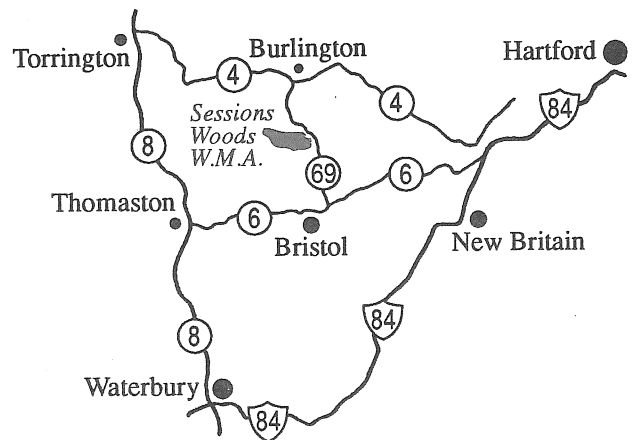
Landowners can help shape the future of wildlife, even in a small area like their backyards, by enhancing wildlife habitat through plantings and other wildlife management techniques. On display are trees and shrubs, identified by common and scientific names, which can be used in landscaping backyard habitats. Groups of at least 12 can arrange for a guided tour and discussion of the habitat values of the plants by a wildlife biologist.

Additional information is available on most of the practices demonstrated along the trails. Visitors may inquire inside the CEDARS Center or write to CEDARS, P.O. Box 1550, Burlington, CT 06013-1550.

Written by Steve Jackson, Western District Wildlife Supervisor, and Peter Picone, Urban Wildlife Biologist

How to Get to CEDARS

CEDARS is located at the Sessions Woods Wildlife Management Area on Route 69, approximately three miles south of Route 4 in Burlington and approximately three miles north of Route 6 in Bristol. The CEDARS trails may be used any day from sunrise to sunset.



Archaeological Review

A review of the State of Connecticut Archaeological Site Files shows no known archaeological resource in the project area. However, areas of well-drained soils adjacent to wetland systems offer ideal environmental and topographic settings for the location of small hunting and gathering economies. Three prehistoric archaeological sites are located to the east of the forest area along Plains Road. These sites appear to date from 3,000 to 4,000 years ago and represent Native American encampments along Trout Brook. Similar natural features within the Westbrook Town Forest would predict the location of similar cultural resources. The knolls projecting out into wetlands in the western portion of the forest are of particular archaeological sensitivity.

The use of the Town Forest for passive recreation should have no impact on any cultural resources that might be in the area. However, these prehistoric sites will be relatively shallow within the soil so that any proposed land disturbance should have an archaeological survey prior to construction activities to ensure the preservation of sites within the impact area.

In addition, the forest setting offers an excellent outdoor laboratory to teach students about prehistoric Native American cultural adaptation to Connecticut's woodland environment. The trail system can illustrate the natural resources Indian peoples would have exploited in their seasonal rounds and how their culture developed over thousands of years.

In summary, the Office of State Archaeology has no recorded sites in the project area. However, portions of the forest are sensitive to the discovery of unknown archaeological sites. The passive recreational plans for the forest should have no adverse effect on any cultural resources. Should proposed plans change and limited construction activity be desired, those areas of impact should be reviewed prior to such work. Educational opportunities to teach students about Native American cultural adaptation and use of the environment can be easily incorporated within the forest trail system. The Office of State Archaeology looks forward to working with the Town of Westbrook in the conservation and preservation of its archaeological heritage. Please contact the State Archaeologist at UCONN if further assistance is required (Dr. Nicholas Bellantoni, 486-5248).

Outdoor Classroom Activities

There are a number of references which the Town can utilize in developing outdoor classroom activities or postings along the trails. The Middlesex County Soil and Water Conservation District (SWCD) Executive Director is available to confer with anyone from the Town or local schools who may be interested in this project (contact Ann Hadley at 345-3219). The Town should have copies of the following references for school use (one copy of each is included with this report for the Forest Commission):

- ☛ "Investigating Your Environment", USDA Forest Service. A series of lesson plans with activities.

- ☛ "A Teacher's Manual for Outdoor Classrooms: How to plan, develop and use them", USDA Soil Conservation Service, Alabama.

For the following reference, you should contact the Middlesex County Soil and Water Conservation District (345-3219) so they can order copies for you.

- ☛ "Conserving Soil", 1990, National Association of Conservation Districts. Resource packet with 24 curriculum activity sheets, teachers, guide and overheads.

Specific to the Town Forest, there are a number of subject areas which are ideally suited for special outdoor classroom activities or for informational markers along the trails.

1. Geology

Activities can revolve around the difference between bedrock and glacial geology at the site.

A. The bedrock was formed millions of years ago while the glacial deposits were emplaced thousands of years ago. A discussion of geologic time and differences in geologic history of the two formations will be appropriate (bedrock deformation vs. glacial deposition of sediments).

B. The bedrock geology controls the topography of the area. The bedrock in this area (refer to geologist's report) contains much quartz, which is erosionally resistant to chemical and physical weathering. The bedrock has controlled where any glacial deposits were placed.

Some large rock boulders are found scattered around the area and placed randomly on other bedrock outcrops. In some instances, the boulders and pieces have simply been separated from the underlying bedrock by in-place weathering. Other pieces may have been transported small or great distances by glaciers. They should only be termed glacial erratic if they differ distinctly in composition from the underlying bedrock.

C. Bedrock and glacial deposit differences are responsible for the formation of different soil types and soil depths. The bedrock here is highly resistant to chemical and physical erosion, thus a shallow soil development. The glacial outwash deposits lend themselves to better soil development.

D. Students could undertake an investigation of the mineralogy of the bedrock and the chemical and physical conditions under which this rock was formed. The bedrock type at this location is predominantly gneiss. Gneisses are formed under extreme temperature and pressure conditions. The pressures have caused the minerals in the rock to align in planes called a foliation pattern. In places one can also see that the foliation has been folded.

At several locations along the trails, one can observe bedrock fracture patterns. These patterns are either caused by physical weathering causing breaks along parallel planes or fractures controlled by the internal mineralogy foliation planes. A good example of the physical weathering fracture pattern can be seen on the west end of the yellow trail (on the east end of the rock ridge). A good example of mineralogy controlled fracturing can be found on the outcrop at the far eastern part of the red trail loop.

At this same outcrop on the red trail loop, an example of cross-cutting relationships can be observed. Here, an intrusion of granite pegmatite cuts across the gneiss. The granite contains quartz, pink feldspars and other silic minerals. It is called a pegmatite because the feldspar crystals are at least 2 centimeters in length. Cross cutting relationships are important because they show relative ages of the two rocks. Here we can see that the granite, which cuts across and includes some of the gneiss, came after and is younger than the gneiss.

2. Wetland Investigations

Wetland investigations could include exploring the following parameters:

- water chemistry

- aquatic life organisms (benthic and in the water column) aquatic plants

- seasonal variations

3. Soil Testing

- pH
- textures
- organic content
- soil depth
- slope
- soil formation
- soil erosion
- land uses based on soil type

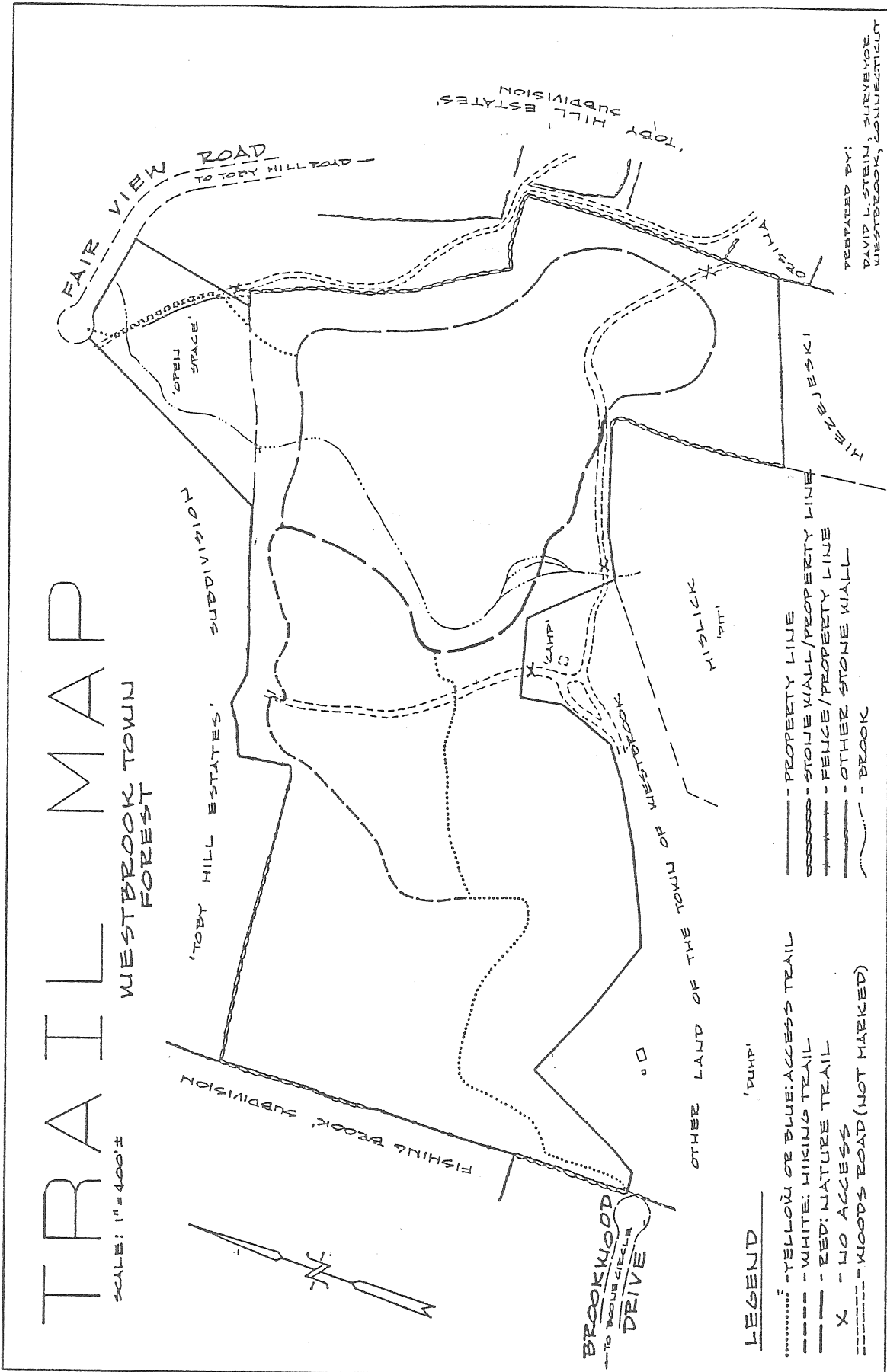
4. Community Ecosystem

Activities involving discussion of the area as a community ecosystem; involve members of the food chain and how variables in their environment affect the ecosystem.

5. Utilize Programs Available Through State DEP

Teachers should become involved in Project Learning Tree and Project Wild through the State DEP Environmental Education Division. (Contact Diane Joy at 424-3599) These programs provide teacher training and curriculum guides. Also, the SWCD is trying to acquire more information on Project WET (Water Education for Teachers).

TRAIL MAP



State Park Planner Comments

(The following comments are based on office analysis only.)

The two basic factors controlling use of this property are its physical character and the management policy adopted by the town. The first of these dominates in this case, because of the severe constraints posed by two north-south trending wetland/streambelt zones bordering an intervening area of extremely stony, steeply sloping land. Furthermore, there are no major natural resources such as a sizeable stream or a waterbody which could be the focal point of a developed recreation area. Therefore, the land base itself points toward low intensity, passive use such as hiking, nature walking and possibly some environmental education based upon the varying site types within the property. Given its limited size, the existing trail system seems appropriate, although site evaluation of streambelt crossings and possible trail "hardening" may be necessary to prevent seasonally muddy trail conditions. Also, given the likely low volume of use, it may not be necessary to consider development of small gravel parking lots at the two public access points.

Town management policy is the other factor to consider. For the reasons listed above, town policy will closely follow the use direction mandated by physical character. However, a key variable involves whether the property is to be a defacto natural area/park or an actively-managed forest as its name implies. Although wetland, slope, and stoniness factors limit the property's silvicultural potential, some management would be feasible and the town forest could be utilized as a demonstration forest/tree farm, which could also be useful from an environmental education standpoint. This obviously is a decision for the town to make.

(Information on trail side interpretive signing may be found in the Appendix).

Appendix

Interpretive Nature Trail Signs

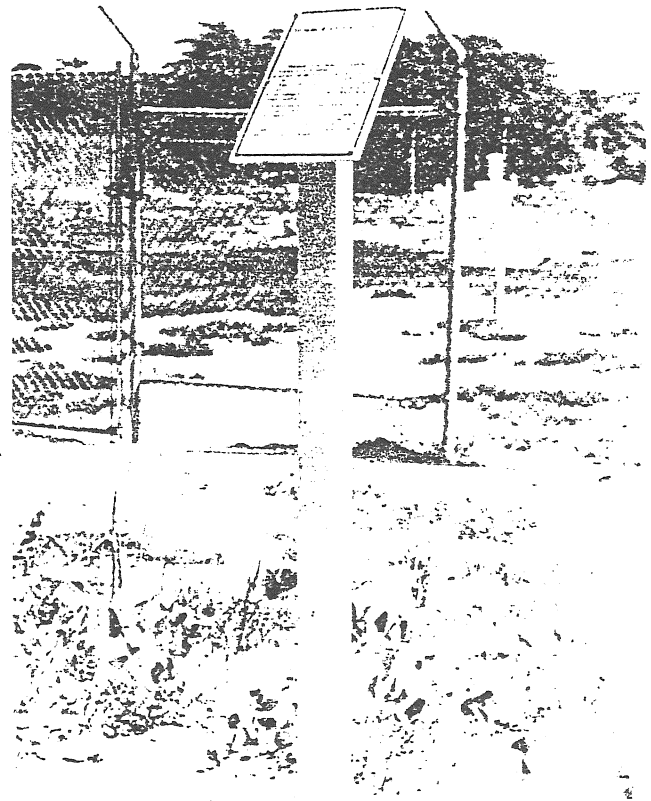
To provide the public with an educational and informative visit to Cape Henlopen State Park, Delaware, a nature trail was developed which highlights the dune habitat, the pinelands and wetland environments. Interpretive nature trail signs were developed to provide interpretation and to give direction and clear graphic portrayal.

Many design considerations

were addressed for the proposed trail signs. Due to the corrosive beach atmosphere in the park, the type and quality of material were major factors. Budget constraints and vandal-resistant materials were also assessed. Through the collective efforts of the Delaware Division of Parks and Recreation, an all-aluminum sign was selected.

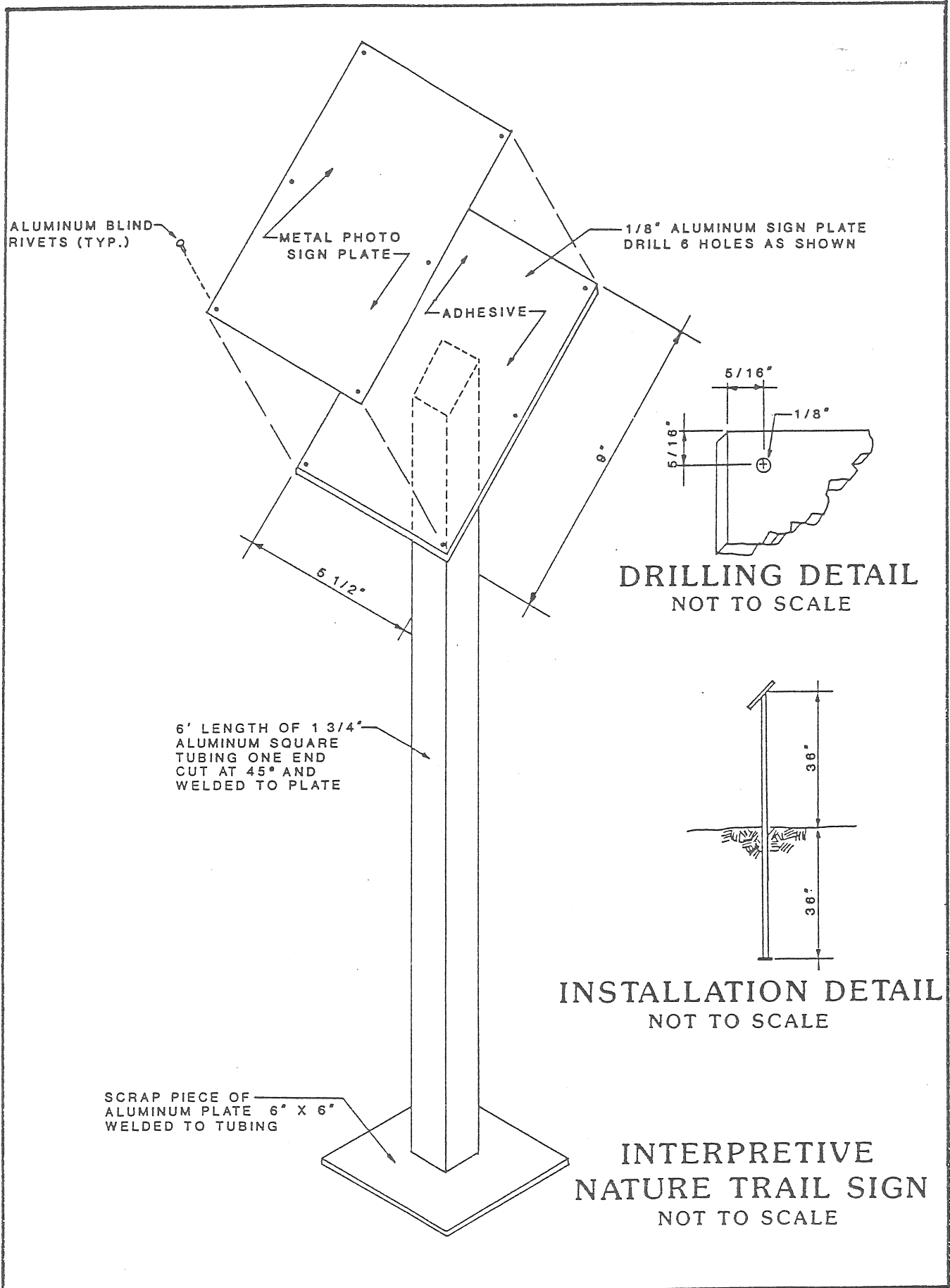
The Technical Services Section provided the metal photo man-

ufacturer with the graphics, artwork and text. The metal photos are mounted by using an exterior strip adhesive and aluminum rivets. The adhesive acts as a barrier between the metal photo and aluminum plate to prevent oxidation. This entire unit is mounted to an aluminum plate which is welded to the top of the post at a 45° angle. Cost per sign is under \$80.00 which includes all materials, artwork, printing and installation.



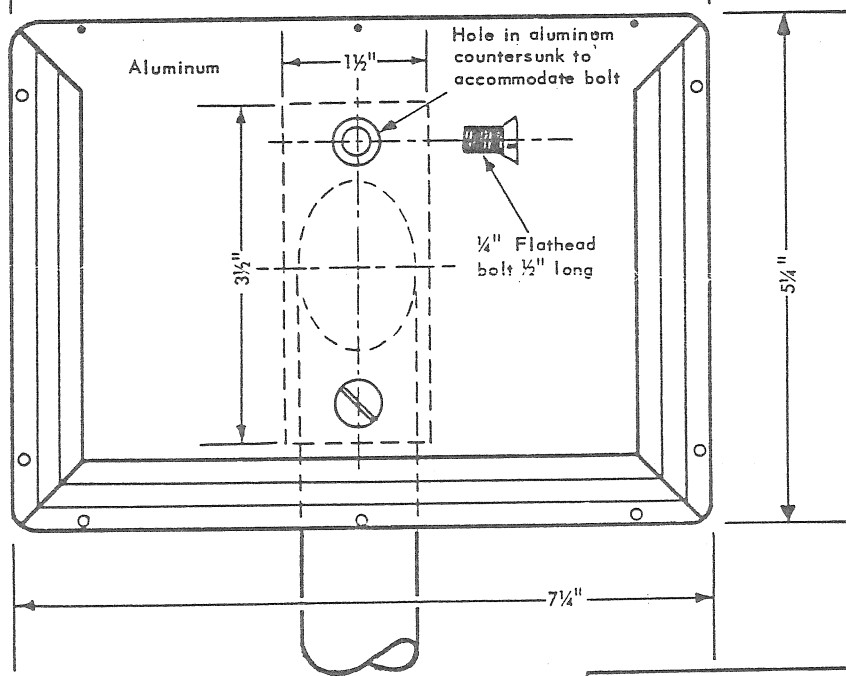
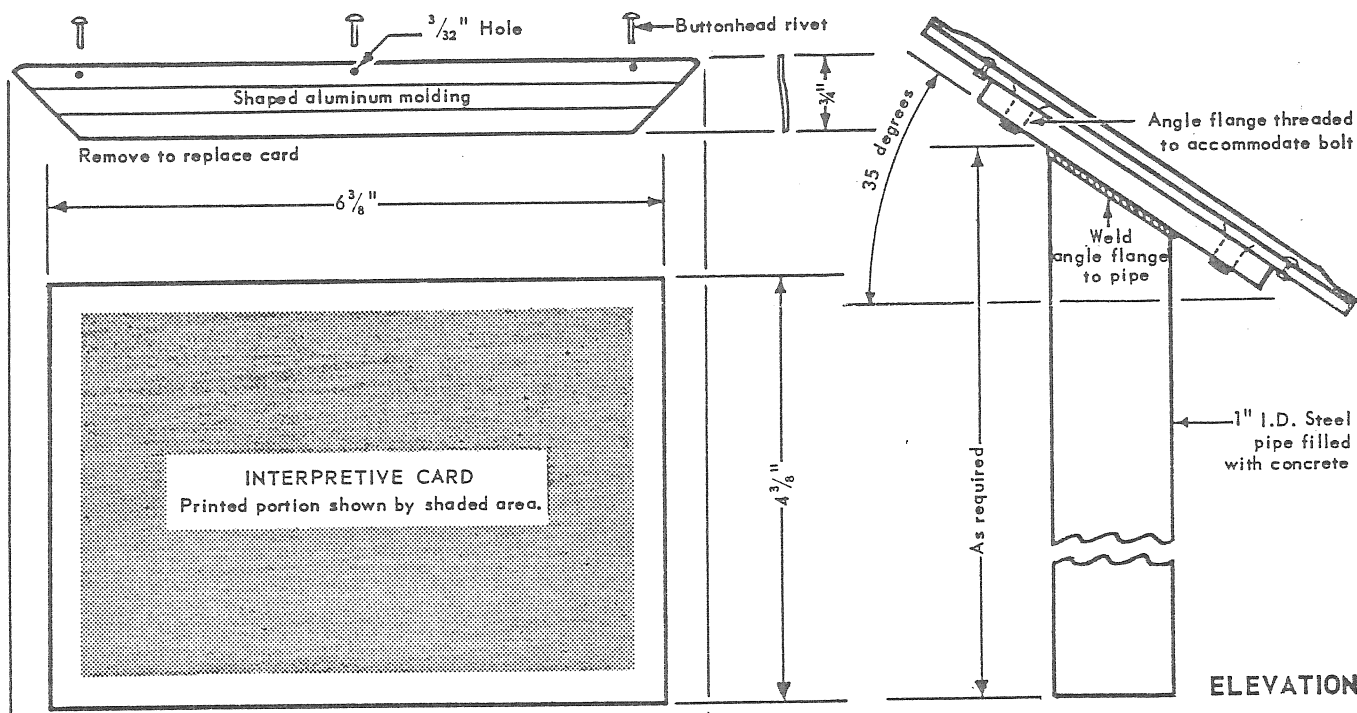
DESIGN . . . A publication of the Park Practice Program

Interpretive Nature Trail Signs		Contributed by
Index	Winter 1986	C.L. Gaines
I-6945	Control N-1690-1	Delaware Parks/Rec



An attractive trailside label holder designed and built to resist weather damage and vandalism. Labels proper are typed or printed on bond paper — in color, if desired — then laminated in plastic. These are placed in the aluminum frame from the top after which the top section of mitered frame is fastened in place with soft aluminum rivets.

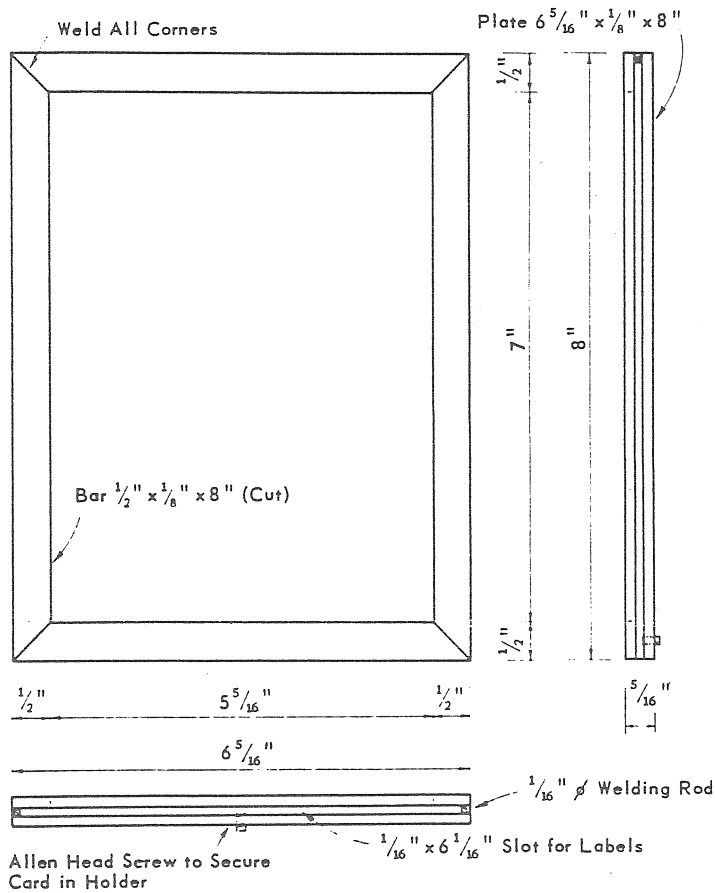
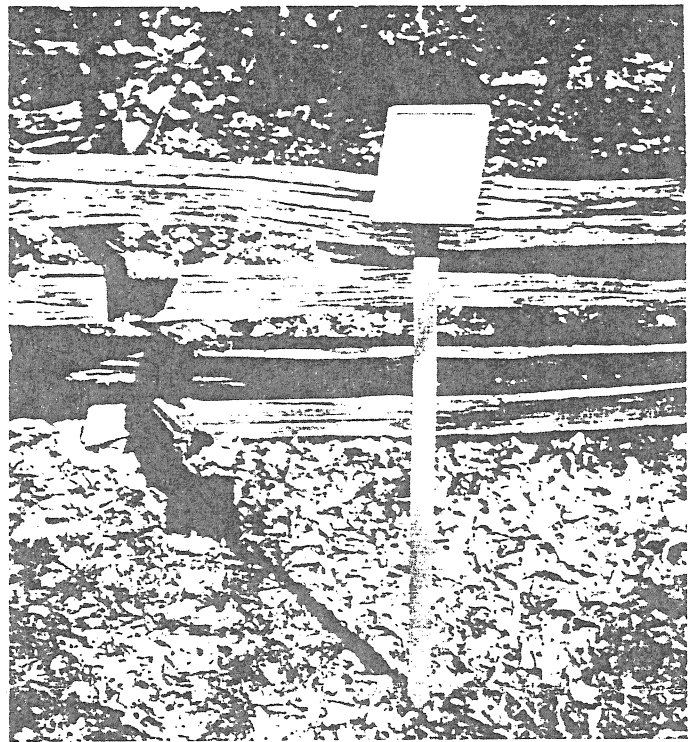
The steel pipe post, set 18 inches in the ground, is filled with concrete. A steel rod welded crosswise near the bottom end of the post will serve as a toggle and make unauthorized removal difficult. May be fabricated in park mechanical shops, or purchased on the open market for less than \$10 in quantity lots.



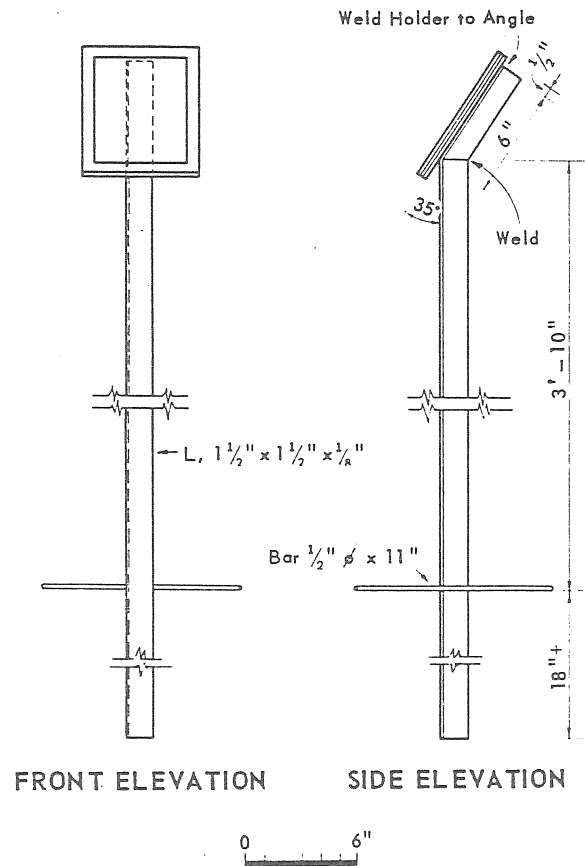
United States Department of the Interior, National Park Service		TRAIL LABEL HOLDER	
THE PARK PRACTICE PROGRAM			
National Conference on State Parks • National Recreation & Parks Association			
DATE	November 1959	PLATE	123 B
INDEX	I-6701	CONTROL	S-0383-1
		Contributed by NATIONAL PARK SERVICE U.S. Department of the Interior	

A simple, easily placed trailside marker which could be fabricated in most park shops.

Note anchor bar near the foot of the upright, placed to discourage unauthorized removal. Labels used in this holder are printed on cards and then laminated in plastic. All metal parts of this marker should be treated with rust preventive.



PLAN OF HOLDER



FRONT ELEVATION

SIDE ELEVATION

UNITED STATES DEPARTMENT OF THE INTERIOR, NATIONAL PARK SERVICE		TRAIL LABEL HOLDER	
<i>The Park Practice Program</i>		Contributed by	
NATIONAL CONFERENCE ON STATE PARKS	AMERICAN INSTITUTE OF PARK EXECUTIVES	NATIONAL PARK SERVICE	
DATE April 1958	PLATE 56 1	U.S. Department of the Interior	
INDEX I-6707	CONTROL S-0152-1		

ABOUT THE TEAM

The Eastern Connecticut Environmental Review Team (ERT) is a group of professionals in environmental fields drawn together from a variety of federal, state and regional agencies. Specialists on the Team include geologists, biologists, foresters, soil specialists, engineers and planners. The ERT operates with state funding under the supervision of the Eastern Connecticut Resource Conservation and Development (RC&D) Area — an 86 town region.

**The services of the Team are available as a public service
at no cost to Connecticut towns.**

PURPOSE OF THE TEAM

The Environmental Review Team is available to help towns and developers in the review of sites proposed for major land use activities. To date, the ERT has been involved in reviewing a wide range of projects including subdivisions, landfills, commercial and industrial developments, sand and gravel excavations, elderly housing, recreation/open space projects, watershed studies and resource inventories.

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

REQUESTING A REVIEW

Environmental reviews may be requested by the chief elected official of a municipality or the chairman of town commissions such as planning and zoning, conservation, inland wetlands, parks and recreation or economic development. Requests should be directed to the chairman of your local Soil and Water Conservation District and the ERT Coordinator. A request form should be completely filled out and should include the required materials. When this request is approved by the local Soil and Water Conservation District and the Eastern Connecticut RC&D Executive Council, the Team will undertake the review on a priority basis.

For additional information and request forms regarding the Environmental Review Team please contact the ERT Coordinator: 203-345-3977, Eastern Connecticut RC&D Area, P.O. Box 70, Haddam, Connecticut 06438.

Interpretive Nature Trail Signs

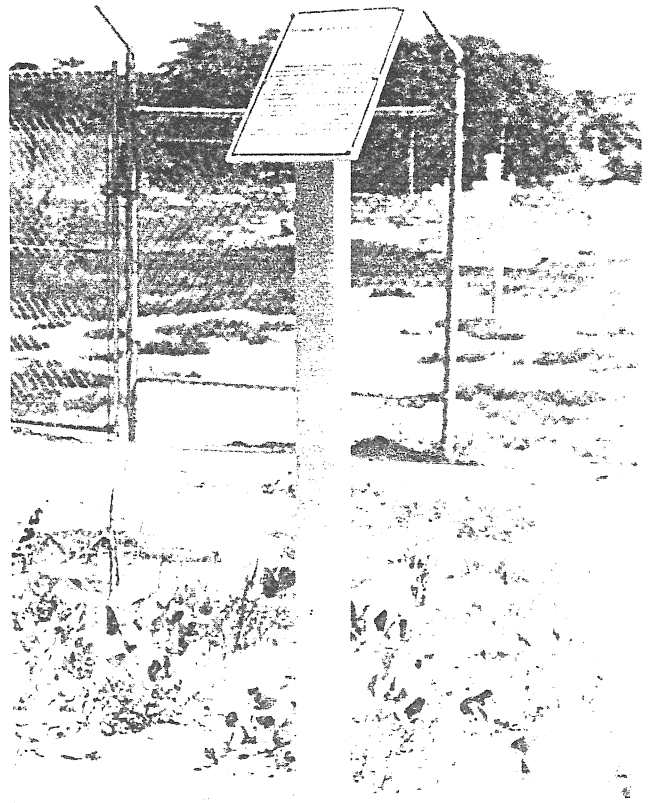
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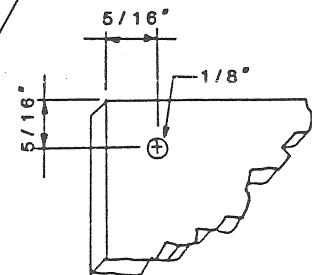
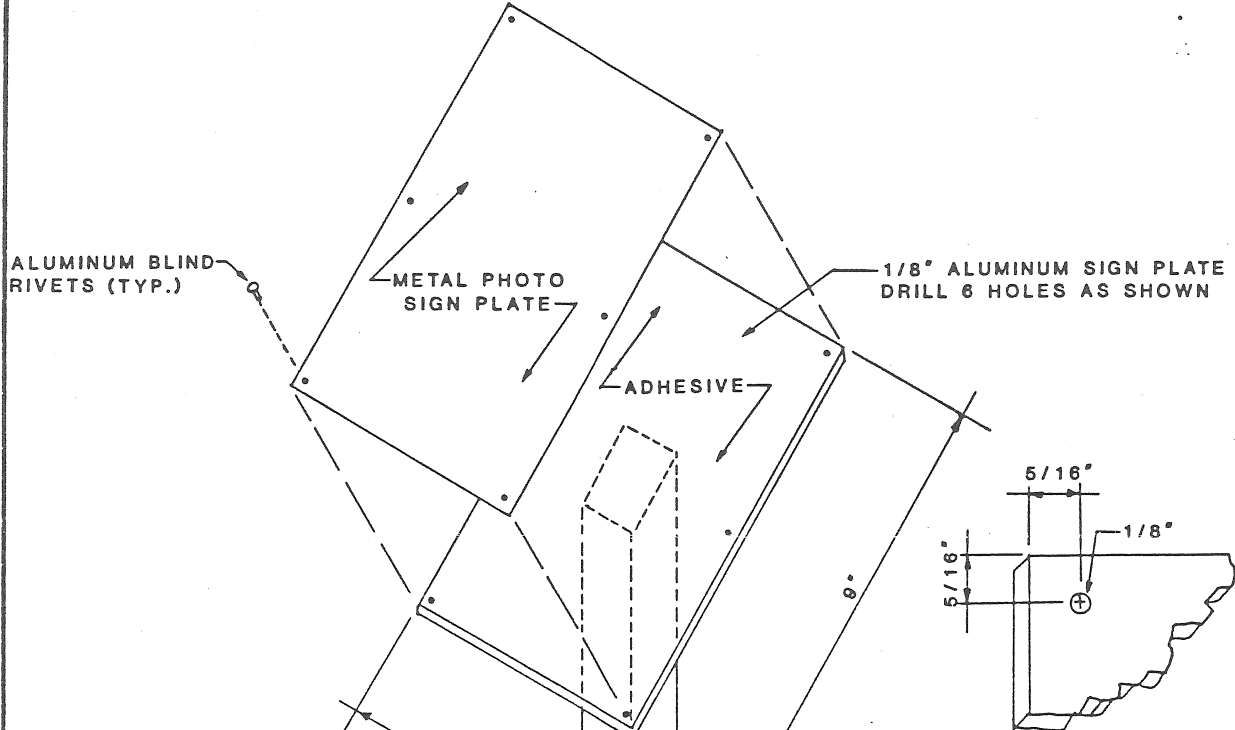
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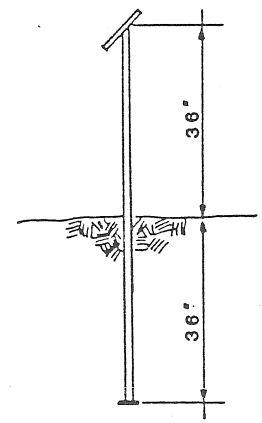
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Interpretive Nature Trail Signs		Contributed by
Index I-6945	Winter 1986	C.L. Gaines
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DRILLING DETAIL
NOT TO SCALE

6' LENGTH OF 1 3/4" ALUMINUM SQUARE TUBING ONE END CUT AT 45° AND WELDED TO PLATE



INSTALLATION DETAIL
NOT TO SCALE

SCRAP PIECE OF ALUMINUM PLATE 6" X 6" WELDED TO TUBING

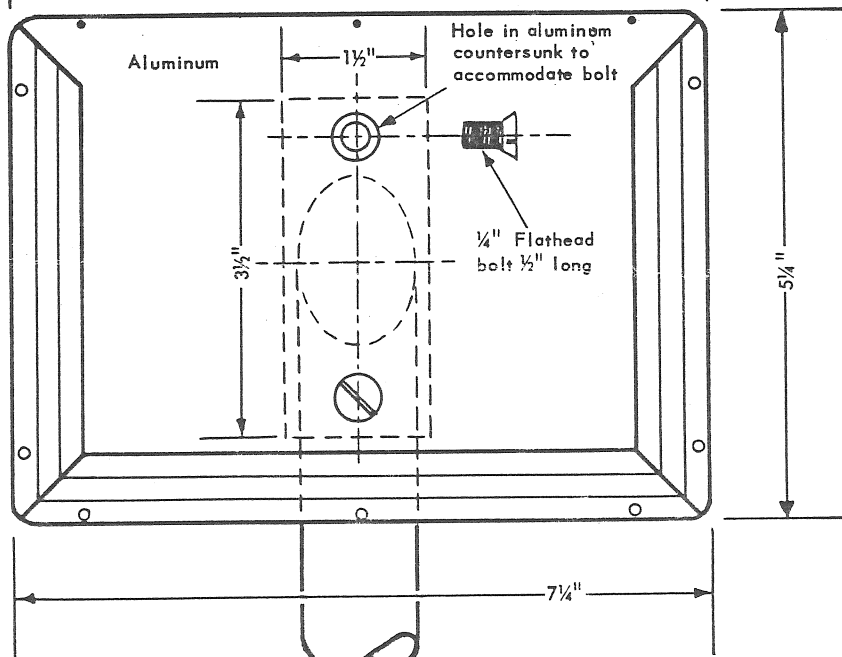
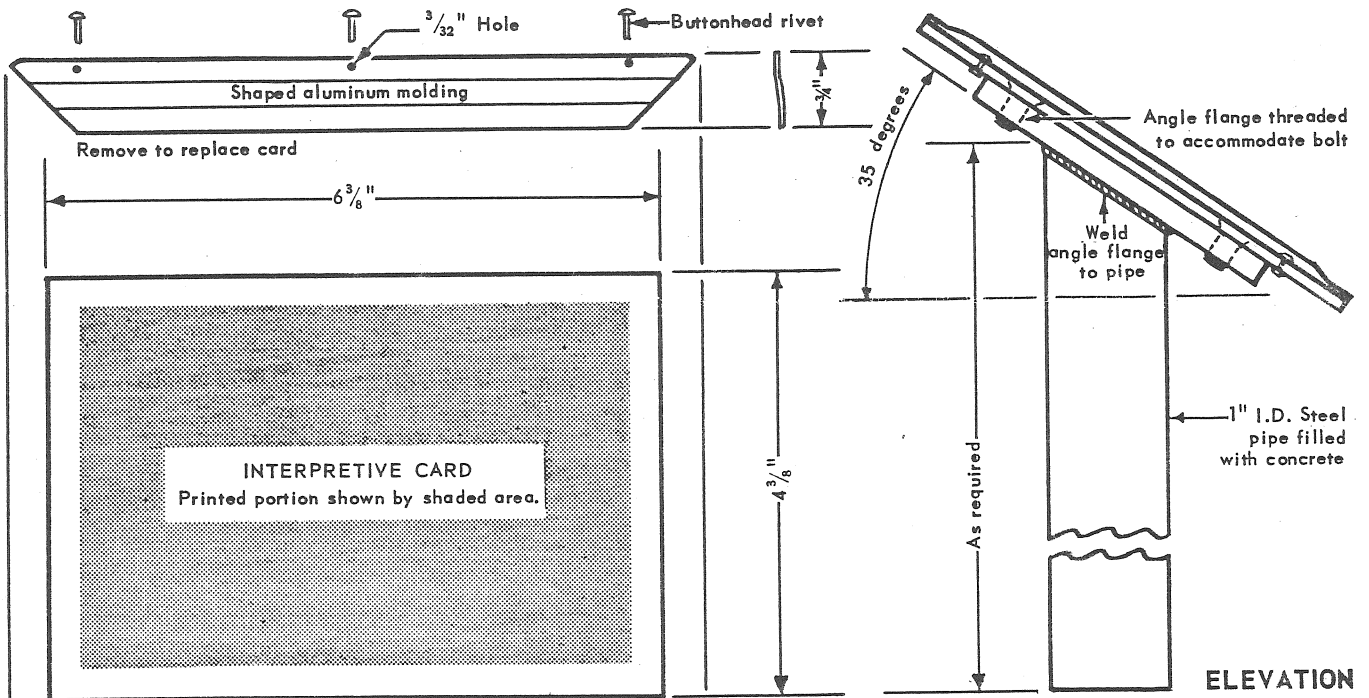
INTERPRETIVE NATURE TRAIL SIGN
NOT TO SCALE

An attractive trailside label holder designed and built to resist weather damage and vandalism.

Labels proper are typed or printed on bond paper — in color, if desired — then laminated in plastic. These are placed in the aluminum frame from the top after which the top section of mitered frame is fastened in place with soft aluminum rivets.

The steel pipe post, set 18 inches in the ground, is filled with concrete. A steel rod welded crosswise near the bottom end of the post will serve as a toggle and make unauthorized removal difficult.

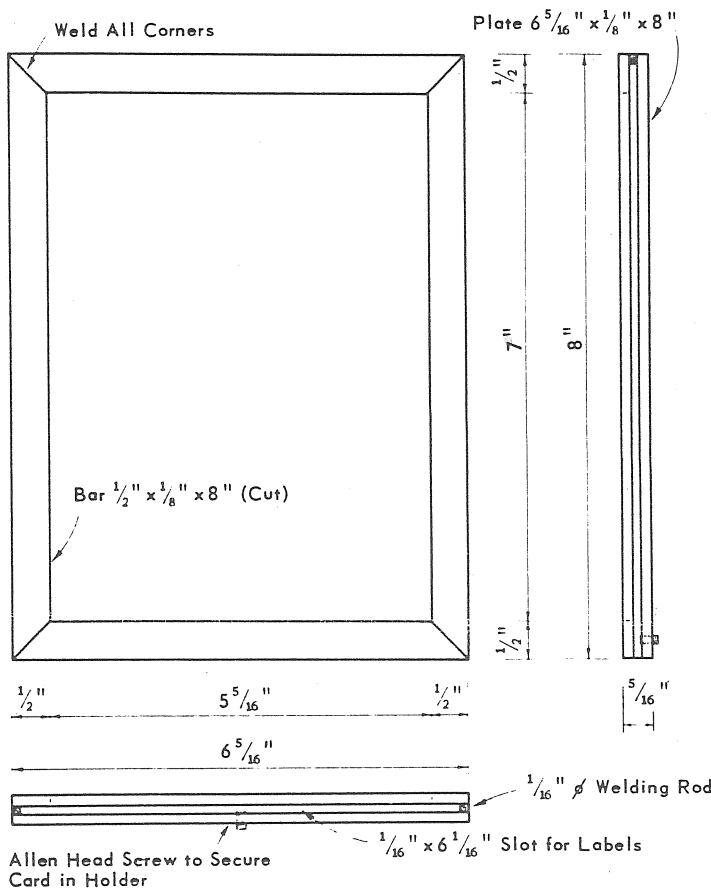
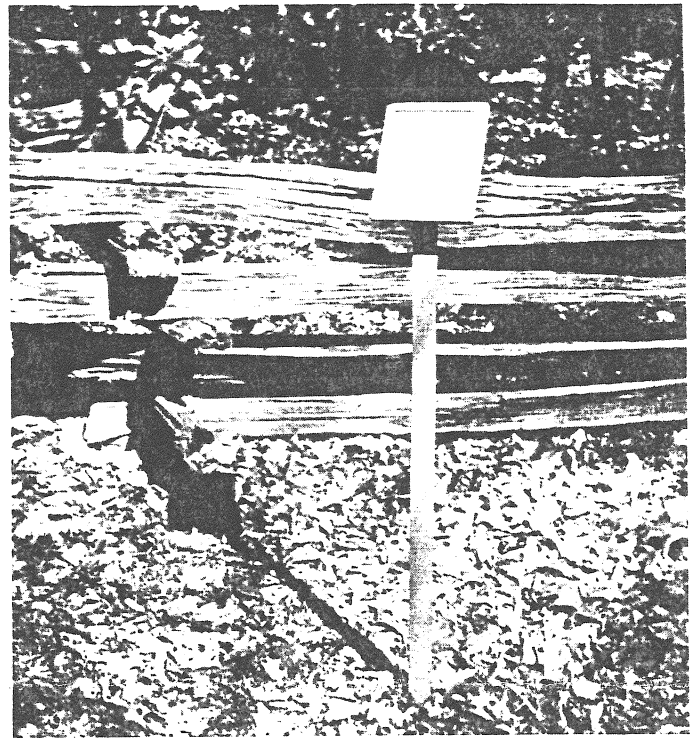
May be fabricated in park mechanical shops, or purchased on the open market for less than \$10 in quantity lots.



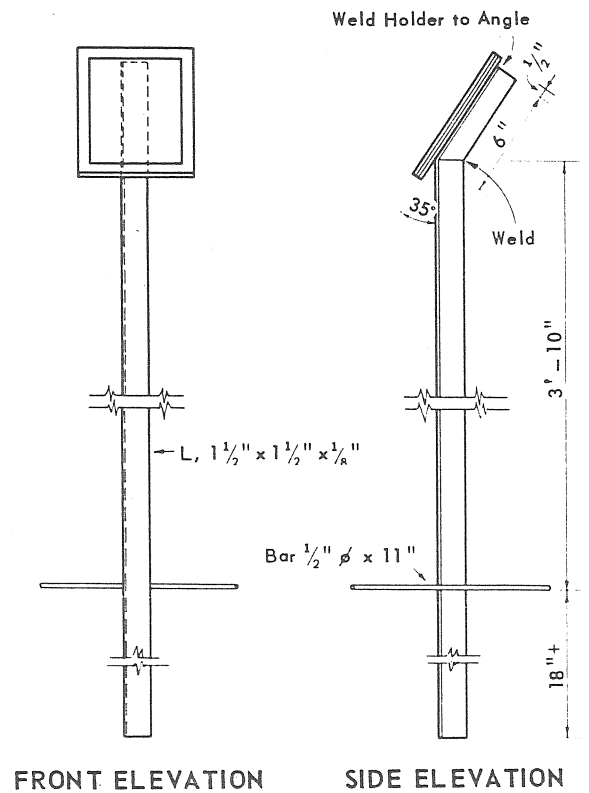
United States Department of the Interior, National Park Service		TRAIL LABEL HOLDER	
THE PARK PRACTICE PROGRAM			
National Conference on State Parks • National Recreation & Parks Association			
DATE	November 1959	PLATE	123 B
INDEX	I-6701	CONTROL	S-0383-1
		Contributed by NATIONAL PARK SERVICE U.S. Department of the Interior	

A simple, easily placed trailside marker which could be fabricated in most park shops.

Note anchor bar near the foot of the upright, placed to discourage unauthorized removal. Labels used in this holder are printed on cards and then laminated in plastic. All metal parts of this marker should be treated with rust preventive.



PLAN OF HOLDER

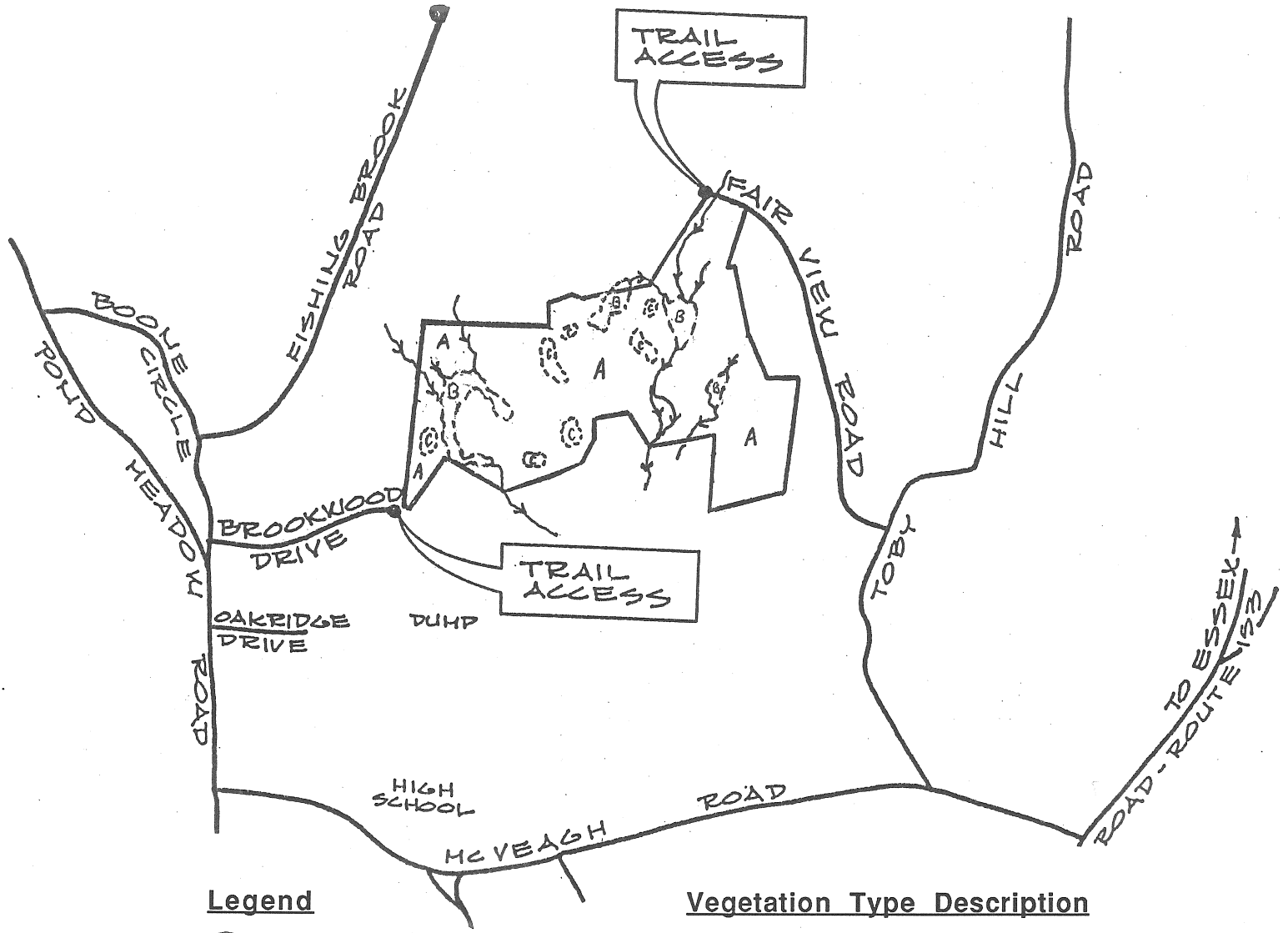


UNITED STATES DEPARTMENT OF THE INTERIOR, NATIONAL PARK SERVICE		TRAIL LABEL HOLDER	
<i>The Park Practice Program</i>		Contributed by	
NATIONAL CONFERENCE ON STATE PARKS	AMERICAN INSTITUTE OF PARK EXECUTIVES	NATIONAL PARK SERVICE	
DATE April 1958	PLATE 56 I	U.S. Department of the Interior	
INDEX I-6707	CONTROL S-0152-1		

VEGETATION TYPE MAP



Scale 1" = 1000'



Legend

- Road
- Property Boundary
- Vegetation Type Boundary
- Stream

Vegetation Type Description

- A. Mixed Hardwoods - ±46 acres**
Fully -stocked, pole to sawtimber size.
- B. Hardwood Swamp - ±5 acres**
Fully-stocked, all size classes.
- C. Oak Ridge - ±4 acres**
Under-stocked, sapling to pole size.

Seedling Size - Trees less than 1" in diameter at 4 1/2 feet above the ground (D. B. H.)
 Sapling Size - Trees 1" to 5" in D.B.H.
 Pole Size - Trees 5" to 11" in D.B.H.
 Sawtimber Size - Trees 11" and greater in D.B.H.