Connecticut Forest and Park Association

OUTDOOR CLASSROOM AND DEMONSTRATION FOREST

Rockfall and Middletown, Connecticut

EASTERN CONNECTICUT ENVIRONMENTAL REVIEW TEAM REPORT

Eastern Connecticut Resource Conservation and Development Area, Inc.

Connecticut Forest and Park Association

Outdoor Classroom and Demonstration Forest

Rockfall and Middletown Connecticut

Environmental
Review Team Report

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

for the
Connecticut Forest and Park Association
Rockfall, Connecticut

January 1997

CT Environmental Review Teams
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Acknowledgments

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

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

The field review took place on Thursday, July 25, 1996.

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I would also like to thank Carol Youell, CFPA director of education and natural resource programs, David Smith, Sally Taylor, Dick Bauerfeld, CFPA directors, and John Hibbard, CFPA executive director, for their cooperation and assistance during this environmental review.

Prior to the review day, each Team member received a summary of the proposed project with a general location and soils map. During the field review Team members were able to view other mapped information and were given additional information. Following the review, reports from each Team member were submitted to the ERT coordinator for compilation and editing into this final report.

This report represents the Team's findings. It is not meant to compete with private consultants by providing site plans or detailed solutions to development problems. The Team does not recommend what final action should be taken on a proposed project - all final decisions rest with the CFPA. 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 CFPA. 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 concerning this proposed outdoor classroom and demonstration forest.

If you require additional information please contact:

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Summary List of Major Points

1. Access and Design

- This site has excellent potential for development of an outdoor classroom and demonstration forest despite being dominated by an even-aged forest.

- Decide upon an agreement with the Camp Family as to their wishes with regard to activities taking place within site or hearing of the residence. Possible conflict with program needs and donor wishes should be anticipated and addressed.

- Team members are in agreement that access to the site should be from the CFPA Headquarters which would provide a good "home base" by providing indoor facilities, a large parking lot and a controlled access point. Parking can be provided either by parking at the headquarters and using pedestrian access or by providing vehicular access to a central location (using the North Trail, Outer Loop or 1st Access Road).

- The focal point (first stage/intensive use area) for the outdoor classroom should be Hidden Pond which is centrally located and within walking distance to a variety of vegetative conditions. A vehicle access road for cars or buses to Hidden Pond would eliminate a ±15 minute walk. Seating and cover could be provided in this area for lectures with several trails

leading off to different management examples and education stations that should also have benches.

- The existing trail system should be used and is in good shape with improvements needed for drainage and stability if use becomes more intensive. New trails can be developed as needed.

- Control access points with gates or barriers and plan for possible future vandalism from encroaching development.

- Access from the CFPA parking lot (as opposed to access via the Camp Residence driveway) will allow for better access to the possible vernal pool in the southwest portion of the property.

- Trail layout and design should attempt to balance the need to have visitors see many demonstration areas and the need for wildlife to have some refuge.

- Interpretive signs and directional signs should be used throughout the property since it would be easy for people to become lost or disoriented.

- The site at present does not lend itself well to accessibility by the physically challenged. There may be special funds available to construct trails that meet ADA guidelines so that the property can be accessible to all visitors.

2. Education and Curriculum Development

- It is recommended that CFPA follow the program format and overall program design and guide of the James River Timber Corporation's Outdoor Classroom and Demonstration Forest. By using existing curriculum materials and modifying specialized supplements there should be no need to write new curriculum materials. Existing materials can be modified to be state specific for Connecticut.

- There is the need to connect the proposed program offerings with the existing curriculum goals and objectives of the school systems that are most likely to use the site, and teacher workshops will have to address the new curriculum standards being adopted statewide for academic achievement and teacher competencies while addressing the information that CFPA wants to present to the public, students and teachers.

- **Geology** - the bedrock and surficial geology of the site offers some interesting points for study that could easily be incorporated into a discussion of forest development and the natural features found on the property. Areas of interest could be highlighted along a trail system (i.e. bedrock outcrops, eroding of stream channels, etc.) and signage could explain what is being seen.

- **Soils** - Soil monoliths may be constructed for each soil map unit found on the site to show visitors the soil profiles for each type. This can provide insight into studying how trees respond to certain site conditions.

- **Wetland Resources** - the variety of wetland resources (ponds, possible vernal pool, watercourse, littoral marsh, forested wetlands, and riparian

forested wetlands) offers many opportunities to provide valuable lessons in wetland science and watershed management. The existence of a local watershed divide with a wetland/watercourse traversing that divide is uncommon and should be used for its educational value. The concept of a watershed, land use practices and water quality effects can all be studied. The presence of a vernal pool can demonstrate how a relatively small wetland can be critically important to the existence of several wildlife species.

- **Forestry** - Forest management practices such as timber stand improvement, crop tree management, thinning for fuelwood and sawtimber production, shelterwood harvests, final harvests, planting, exotic plant removal, erosion control and proper wetland/stream crossings could all be demonstrated, as well as wildlife habitat enhancement, tree identification and forest succession.

- **Wildlife** - The improvements and management techniques that are used for the various habitats can all be interpreted to the public via trail signs and/or trail guides.

- **Fisheries** - The unnamed watercourse and man-made pond could serve as valuable ecological study areas. Areas of study include aspects of stream ecology such as water quality and aquatic invertebrate communities, identification of streamside riparian vegetation and investigating the role of riparian ecosystems in protecting watercourses. The pond provides opportunities to study the eutrophication process, identification, abundance and life history of aquatic vegetation, zooplankton, and fish populations. Comparisons may be made between the stream and pond habitats.

- **Archaeological Resources** - The Office of State Archaeology maintains class curriculums and lessons for promoting archaeology in Connecticut and the CT Museum of Natural History can provide exhibits on archaeology and environmental subjects for educational purposes. They may be contacted to discuss these options and others that might be useful to the project. Native American Indian and historic European American resources are limited on the site but there are educational opportunities that can be considered for archaeological resources. Examples include:
    1. Stratographic transformations in the soil profile from forest management and other activities.
    2. The changing soil and technological behavior associated with garbage disposal which would include the recovery and dating of historic artifacts dumped on the property and the comparison with modern disposal techniques.
    3. The stone features (adjacent to Westfield Street) can be mapped to learn about the early history of the area.
    4. Outdoor lessons can be developed on the use by Native Americans of forest products.

3. Management

- **Soils** - Improvements will be needed to the existing trail system for drainage and soil stability if they become heavily used. Only one soil unit found on the Soil Survey map is a Connecticut regulated wetland soil, other wetlands and watercourses do exist on the property and the location and identification of these areas can be an on-going project since current maps available only show approximate wetlands with wet spot symbols.

- **Wetland Resources** - A Springtime biological survey should be conducted to confirm if a "true" vernal pool exists by identifying certain "obligatory" species which exist only in vernal pools. Access to the vernal pool should be planned and monitored due to the sensitive nature of the feature. A boardwalk should be constructed from its outer edge into the central pool.

- **Forestry** - Connwood Inc. Foresters have managed the property for decades and there is no reason that this management should not continue, but the management strategies may have to change to meet the new objectives for the property. Of special concern are several invasive exotic plants that have become major components in the understory in the area surrounding the residence. These plants include Japanese maple, Norway maple, winged euonymous and round-leafed bittersweet. In some areas these species have precluded the establishment of other more desirable native plants. Areas that demonstrate forest stewardship if not pre-existing could easily be developed. Planning, development and maintenance will be an on-going project due to the dynamic nature of forests as living systems. Foresters with the DEP Division of Forestry are available to assist with this project on a more in-depth technical level as it progresses.

- **Wildlife** - The Camp Property, being a large, forested parcel, will increase in value and uniqueness as a reserve for forest-dwelling wildlife as this region of the state becomes more urbanized. Two site visits identified many types of wildlife (i.e. deer, hawks, frogs, wild turkey, raccoons, etc.), but the field visits were made after peak nesting periods for wildlife. Most of the improvements and management techniques listed below can be found in the Connecticut Forest Stewardship Incentive Program's Technical Specifications Manual.
    1. The **mixed hardwood vegetation** type area could be favorable breeding habitat for some of Connecticut's interior forest bird species. Improvements and enhancements to this type include:
        - management of invasive exotics
        - develop areas with a variety of size classes
        - creation of temporary openings
        - permanent wildlife food plots
        - creating artificially induced snags
    2. The **hardwood swamp/inland** wetland type areas should be individually identified and improved by light thinnings.
    3. The **mixed hardwood/hemlock** type area could be improved by:
        - releasing or thinning
        - monitoring for insect infestations
        - interspersion with other tree species
    4. The **White pine plantation** should be improved for wildlife by increasing the vertical structural diversity of the stand.
    5. The **White pine/Larch/Norway spruce** area should be managed to maintain dense winter cover through thinnings and hardwood tree removal.
    6. The **Christmas tree plantation** will continue to have moderate value to wildlife for nesting and winter cover.

7. The **open field** should be managed as a permanent herbaceous opening through periodic mowing.
8. The **old field/shrubland** should be maintained in an early successional habitat and invasive exotics should be removed.
9. The **pond perimeter** habitat can be improved by planting native shrubs and the invasive exotics should be removed.
10. The **White spruce** area should be encouraged and enhanced through thinning periodic removal of competing deciduous hardwoods.

Artificial nesting boxes and snags can be beneficial to wildlife and can be placed or created throughout the property. The Team wildlife biologist is available for future consultation throughout the various phases of this project.

- **Fisheries** - Habitat improvements to the pond should be considered since the pond contains fairly uniform shallow water habitat which lacks structure and diversity. Improvements for added cover could include: fallen trees, brush piles and large rocks. The existing wooden bridge which spans the inlet to the pond should be repaired or replaced. *Small Ponds in Connecticut: A Guide for Fish Management* is available from the DEP publication office and it provides of information concerning small pond management.

Table of Contents

List of Figures

Introduction

1. Introduction

The Connecticut Forest and Park Association (CFPA) has requested assistance from the Eastern Connecticut Environmental Review Team in conducting a natural resource inventory and environmental review for a proposed outdoor classroom and demonstration forest.

The ±254 acre site is located on Route 66 (Washington Street) in Middletown adjacent to CFPA Headquarters. The site is the Camp Estate, which is also known as Highlawn Tree Farm. The Camp Family has given the CFPA a deeded conservation easement to most of the property, while retaining a central portion containing the main entrance drive, residence, outbuildings and associated property in a non-easement area.

The CFPA is planning to develop a model outdoor classroom and stewardship demonstration forest on the conservation easement section. The purpose is to provide an outdoor environmental education center to promote hands-on learning about forest management and their ecosystems. They would like to emulate the highly successful James River Timber Corporation's Model Demonstration Forest that has been developed in Maine.

The outdoor classroom and demonstration forest would provide examples of multi-resource management practices dealing with timber, wildlife, fisheries, wetlands, recreation and provide information on the geologic, hydrologic, historic and archaeological significance of the site for forest landowners, natural resource professionals and students and teachers. The site would also serve as a training center for *Project Learning Tree* educator workshops that are offered by CFPA.

It is envisioned that this project would serve as an educational resource for Middlesex County and the state as a whole.

2. Objectives of the ERT Study

The CFPA Outdoor Classroom and Demonstration Forest Committee has asked for assistance in determining the scope, optimal location(s) and overall educational potential of the site. The ERT review will help to evaluate existing information on the site, provide a natural resource inventory, highlight special features of educational or noteworthy value, and discuss special considerations for layout, design, access and management.

3. The ERT Process

Through the efforts of the CFPA Director of Education and Natural Resource Programs this environmental review and report was prepared for the CFPA Outdoor Classroom and Demonstration Forest Committee.

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

The review process consisted of four phases:

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

The data collection phase involved both literature and field research. The field review was conducted on July 25,1996. The emphasis of the field review was on the

exchange of ideas, concerns and recommendations. Being on site allowed Team members to verify information and to identify other resources.

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

Figure 1

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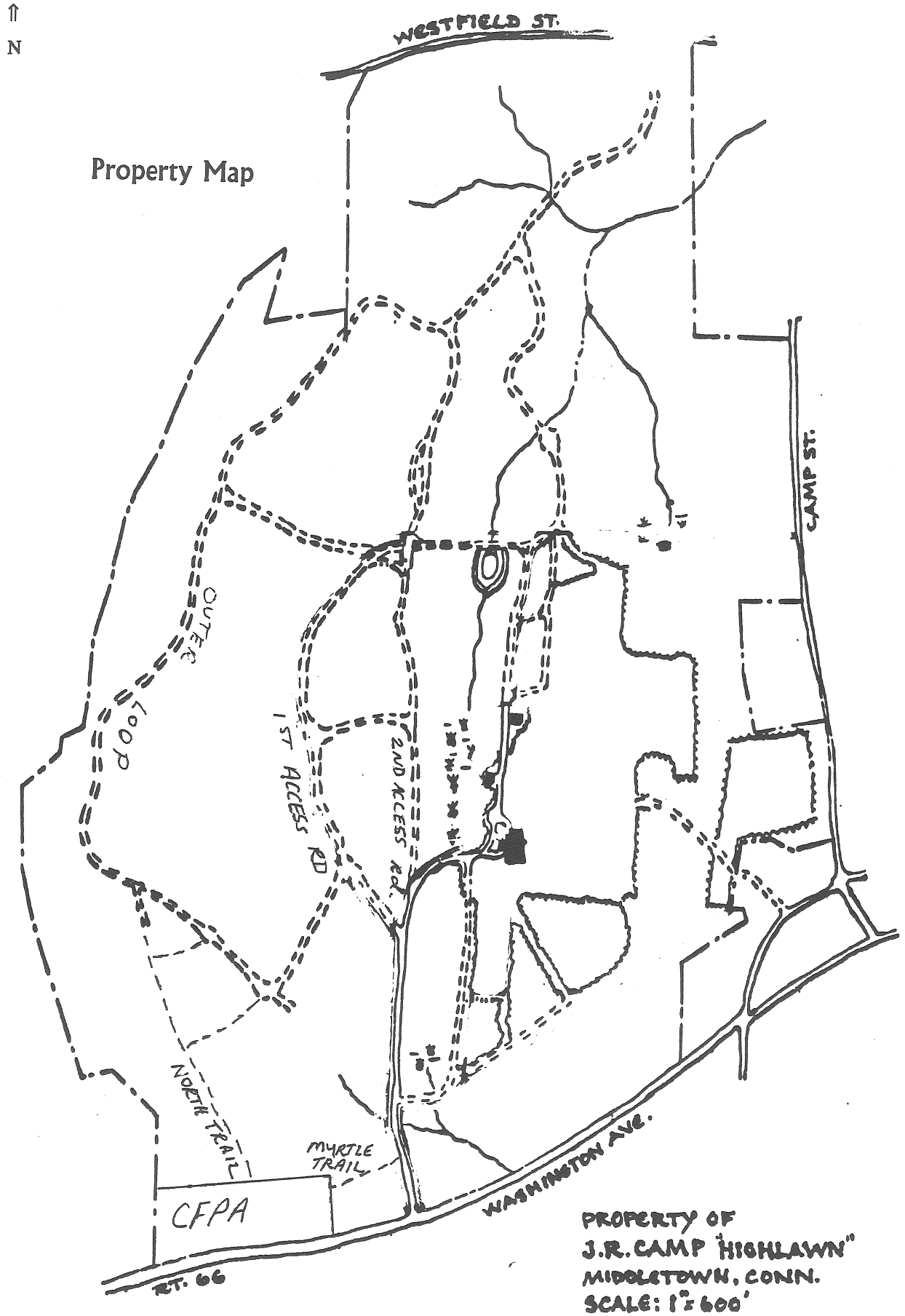
Location and Topographic Map

Scale 1" = 2000'

Approximate Site

Figure 2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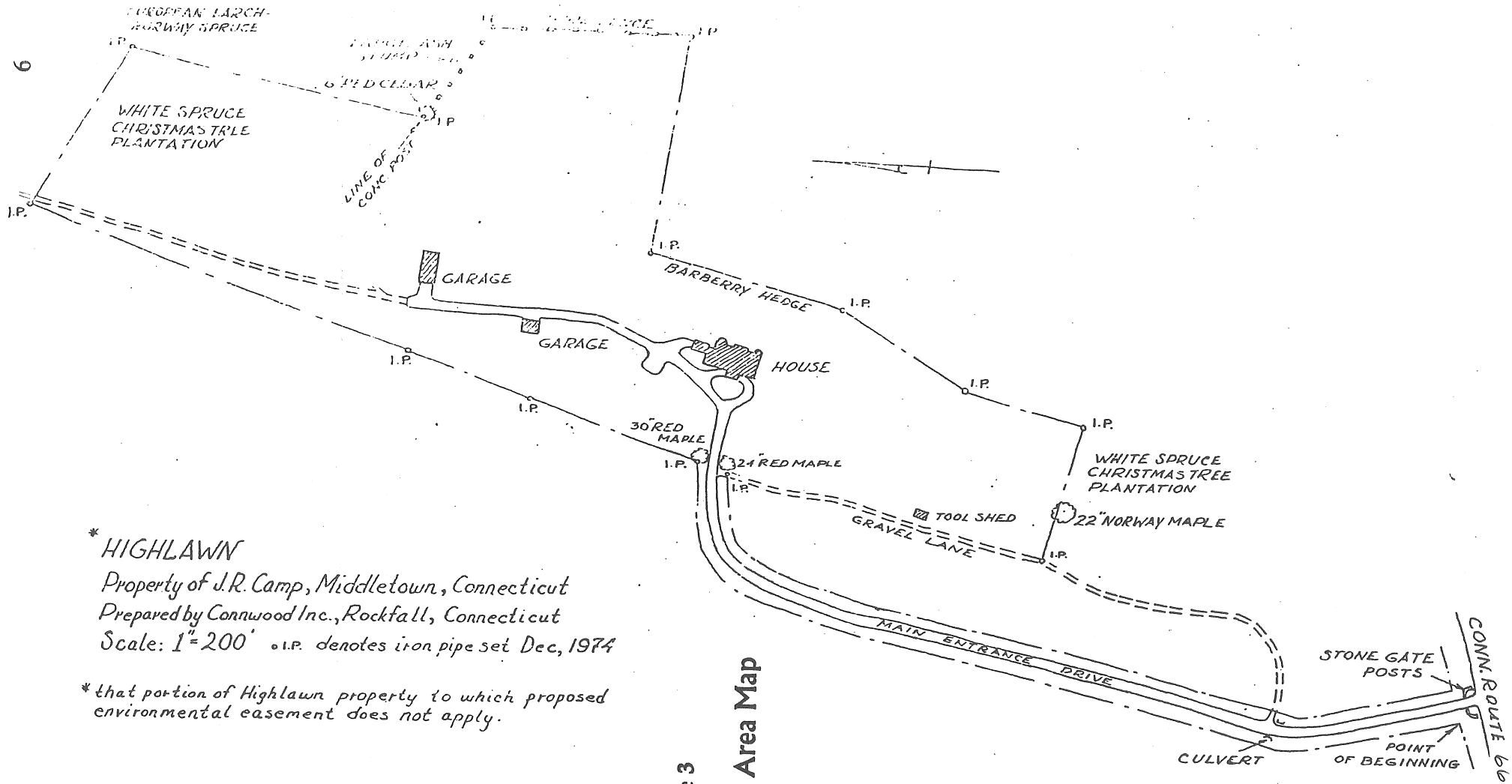
Property Map
WESTFIELD ST.
CAMP ST.
OUTER LOOP
1ST ACCESS RD
2ND ACCESS RD.
NORTH TRAIL
MYRTLE TRAIL
CFPA
WASHINGTON AVE.
RT. 66
PROPERTY OF
J.R. CAMP "HIGHLAWN"
MIDDLETOWN, CONN.
SCALE: 1" = 600'



* HIGHLAWN
Property of J.R. Camp, Middletown, Connecticut
Prepared by Connwood Inc., Rockfall, Connecticut
Scale: 1"=200' • I.P. denotes iron pipe set Dec, 1974

* that portion of Highlawn property to which proposed environmental easement does not apply.

Figure 3
Non-Easement Area Map

Geologic Resources

The Camp property straddles a gentle north-south trending ridge formed by the Hampden Basalt. The Hampden basalt is youngest of the three basalt lava flows interbedded with the 200 million year old red shales and sandstones of the Mesozoic Hartford basin. Although originally laid down horizontally the sediments and flows now dip eastward towards the border fault that bounds the basin. The basalts, being more resistant to erosion than the shales and sandstones, form the major ridges in the Connecticut River Valley. (For an excellent, thorough discussion of the bedrock geology of the Middletown Quadrangle see E. P. Lehmann, 1959 CT Geological and Natural History Survey Quadrangle Report No. 8.)

Although undoubtedly a coincidence, the Camp property seems to have been laid out with geology in mind. Its western boundary follows, almost precisely, the coarse lower contact, and its eastern boundary the upper contact of the Hampden flow. The entire area is underlain by basalt. Very little surficial material covers the western half where bedrock is at the surface virtually everywhere. Basalt rubble, probably formed by frost action just after the area was exposed after the last ice age 14,000 years ago, covers much of the surface. The eastern half is blanketed by 10 to 30 feet of a very fine grained, compact, fissile red till derived from the Mesozoic red shales. The subsurface is thus very impermeable and much of the rainfall makes its way into surface streams rather than being absorbed into the ground.

Good outcrops of the lower portion of the Hampden basalt are found along the northwestern edge of the property. Although its actual contact with the red shales is concealed by recent talus, the fine grained, rapidly chilled character of the basalt and the presence of vesicular (bubbly) material suggest

that a little digging would expose the contact 10 to 20 centimeters below the present ground level at an outcrop near CGS 264750 E, 614500 N.

The bed of the small stream on the east side of the property exposes vesicular sheets and chilled surfaces that must be at or very near, the upper contact of the flow. The basalt is also glacially polished and striated. The overlying fine grained compact red-till is exposed in the stream bed and in steep 15 foot high cuts along its bank. The till is extremely well compacted and might be easily mistaken for Mesozoic bedrock were it not for the fact that glacial striae and grooves can be seen to disappear. On the floor of the valley the till is in turn overlain by several feet of loose, coarse grained alluvium, much of which seems to have been deposited after the area was first cleared and used for animal grazing. In the last hundred years the streams have been rejuvenated and are now cutting into this alluvium. Reforestation significantly decreased the amount of sediment carried into the streams by slope wash without similarly changing the amount of runoff (recall, the subsurface is very impermeable) and the streams, now starved for sediment, are actively eroding channels. Since at first sight the situation seems to be at odds with "common sense" it is an excellent example of the non-linear character of natural systems.

Figure 4

CT Forest & Park Association

Model Demonstration Forest

Middletown Connecticut

Topography

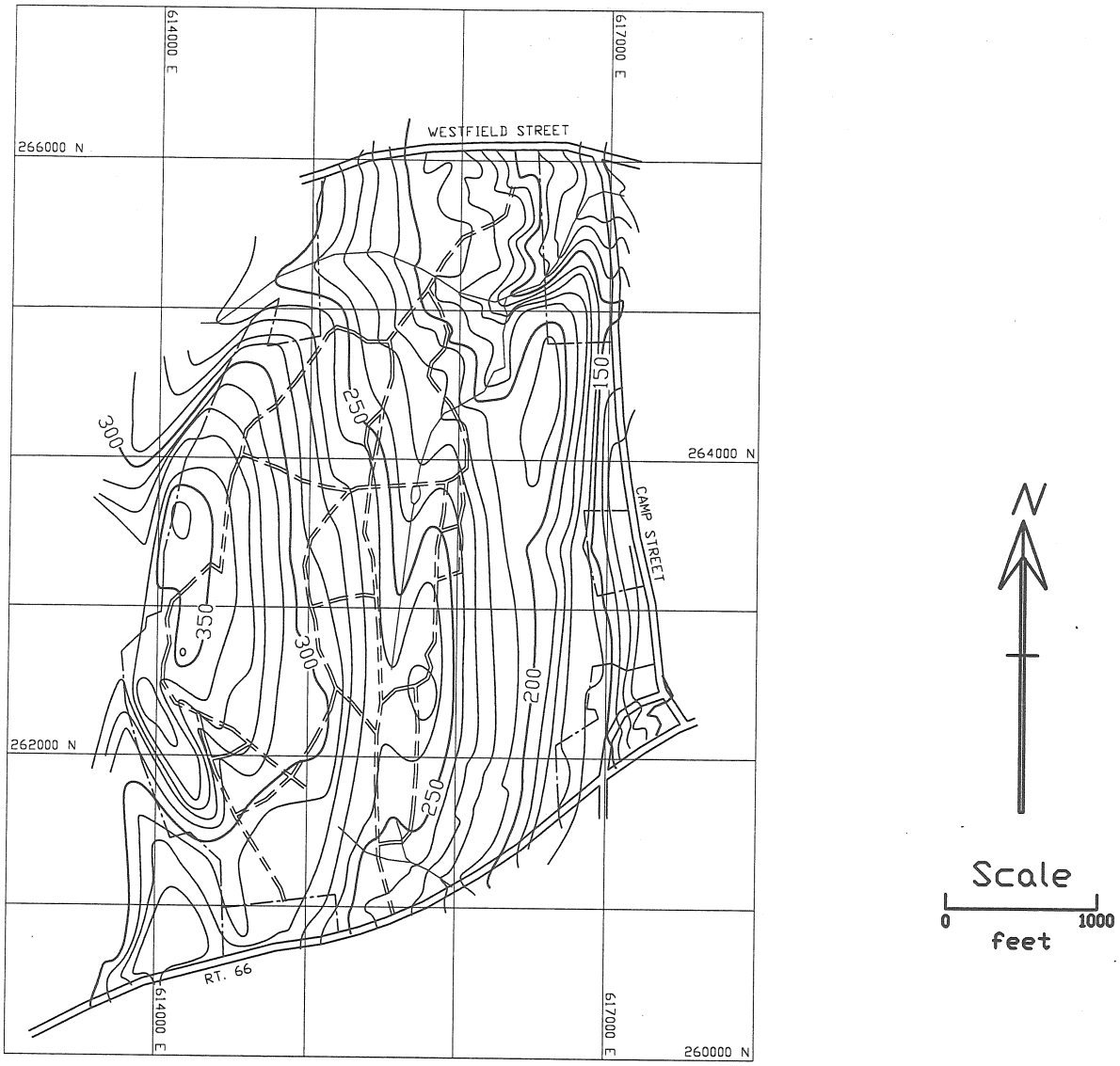


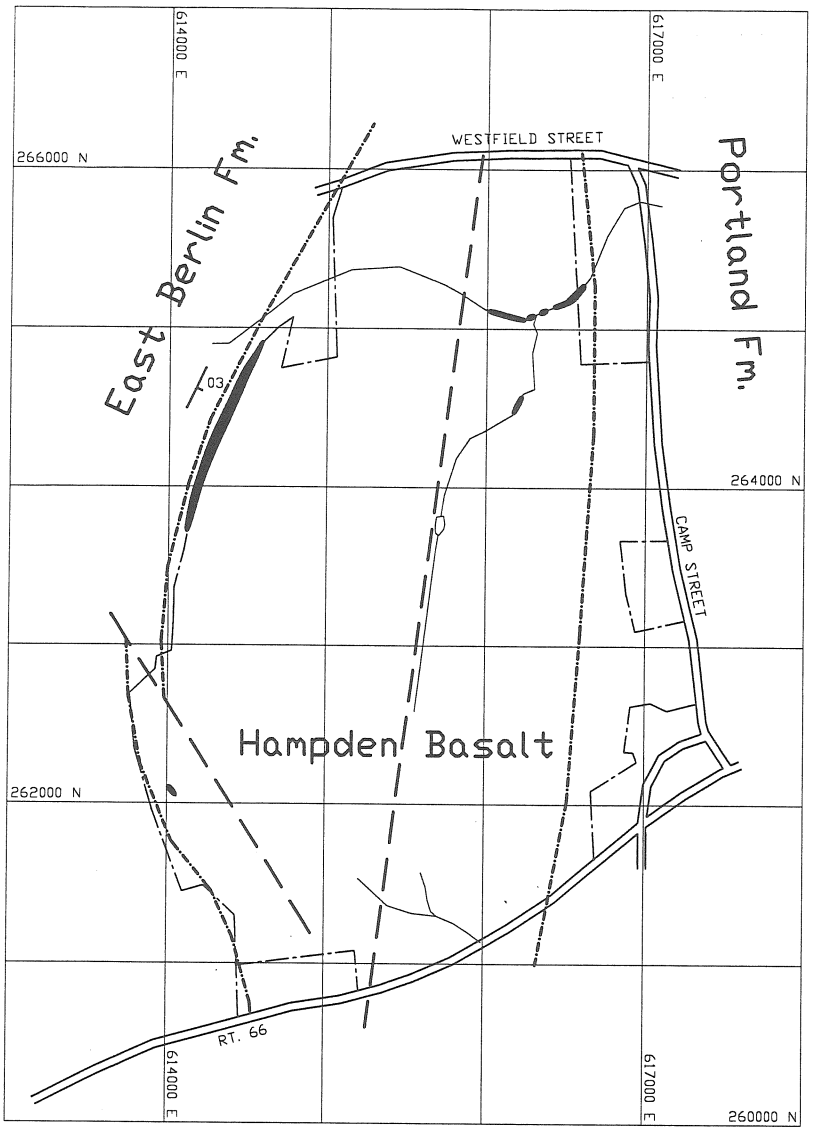
Figure 5

CT Forest & Park Association

Model Demonstration Forest

Middletown Connecticut

Bedrock Geology



Upper Contact Hampden Basalt Flow

Lower Contact Hampden Basalt Flow

Shear Zone

03 Attitude Flow Contact

Outcrop Hampden Basalt

N

Scale

0 1000

feet

Soil Resources

The landscape of this site is dominated by the general soil association, "Wethersfield Ludlow-Wilbraham." This association is characterized by loamy soils that are nearly level to steep and range in drainage from well drained to poorly drained. The soils in this association have a compact substratum (subsurface layer) and are typically found on glacial till uplands and broad glacial till plains.

The soil map (Figure 6) has been taken from the *Soil Survey of Middlesex County, Connecticut (1979)*, atlas sheet number 9. This map illustrates those soil map units that represent the soils that would typically be found on this site. The site is dominated by the soil map unit WmB (Wethersfield, very stony silt loam, 3 to 8 percent slope). This unit is a well drained soil found on drumlins and hill tops of glacial till uplands. Stones and boulders typically cover 0.1 to 3.0 percent of the surface of the soil map unit. A steeper phase of this soil, WmC (Wethersfield, very stony silt loam 8 to 15 percent slope) also dominates the site. The site contains two other less stony phases of Wethersfield (WkC and WkD). The remaining soil map units found on the site include LpB (Ludlow very stony silt loam, 3 to 8 percent slope), LvC (Ludlow extremely stony silt loam, 3 to 15 percent slopes) and Wr (Wilbraham extremely stony silt loam, 0 to 3 percent slopes). A more complete description of the soils for this site can be found in the *Non-technical Soils Description Report* found in the appendix.

The soils on this site exhibit general suitability and/or limitations for specific uses. Tables which provide general planning information on certain identified uses may be found in the appendix. In interpreting the information from these tables, it should be kept in mind that this information is for

general planning purposes and does not preclude the need for more on-site specific investigations. When using the tables, use the soil map units and interpretations as follows (see *Soil Map Legend*, Table _): for map unit LpB use the interpretation for LoA; for LuB use LsB; for LvC use LwC; for Wt use WsA; for UD use Ma.

The most dominant soil features of this site are slope, stoniness and high water tables. For additional interpretive information see *Water Feature Report, Water Management, Recreational Development,* and *Wildlife Habitat* found in the appendix. In reviewing the tables, attention should be paid to the limitations of each soil map unit. These limitations range from "slight" to "severe". Each table contains an "end note" with a description of both terms and uses.

Only one soil map unit is listed as hydric (Wt). This soil map unit is a regulated soil as defined by the State of Connecticut. Additional wetlands and watercourses exist on the site and were too small to be shown on published soil maps. These features have been shown on various maps provided by CFPA as wet spot symbols. The locations are approximate and need further identification and classification. Locating and identifying these and other wetland and watercourse features can be an on-going effort for this parcel.

As indicated by the interpretive tables, the most limiting features of the soils found on this site are slope, stoniness and high water tables. Established trails show little evidence of trouble associated with heavy use at this time. But if more intensive use of the trails occurs, it will be necessary to improve drainage and stability of the surface. A guide for trail maintenance in woodlands has been developed (*A Practical Guide for Protecting Water Quality While Harvesting Forest Products,* 1990) and is available from the Connecticut Resource Conservation and Development Areas.

Additionally, as plans for the site develop, it would be useful to have soil monoliths constructed for each of the soil map units found on the parcel to show visitors the soil profile (horizons) of each soil map unit. This, along with other educational efforts, can provide valuable insight into studying how trees respond to certain site conditions.

Due to the diverse landscape surrounding Hidden Pond, it is recommended that this area be considered as the first stage in developing an outdoor classroom and educational facility. Focusing on this area will allow staff to further investigate the site for additional opportunities that might radiate out from this area. It also might be useful to develop a controlled access to the area by way of the current CFPA parking lot. This would bypass the existing entrance to the non-easement areas and allow for a more secluded and controlled entrance to future facilities or sites. This would also allow for better access to a potential vernal pool in the southwest portion of the property.

Figure 6

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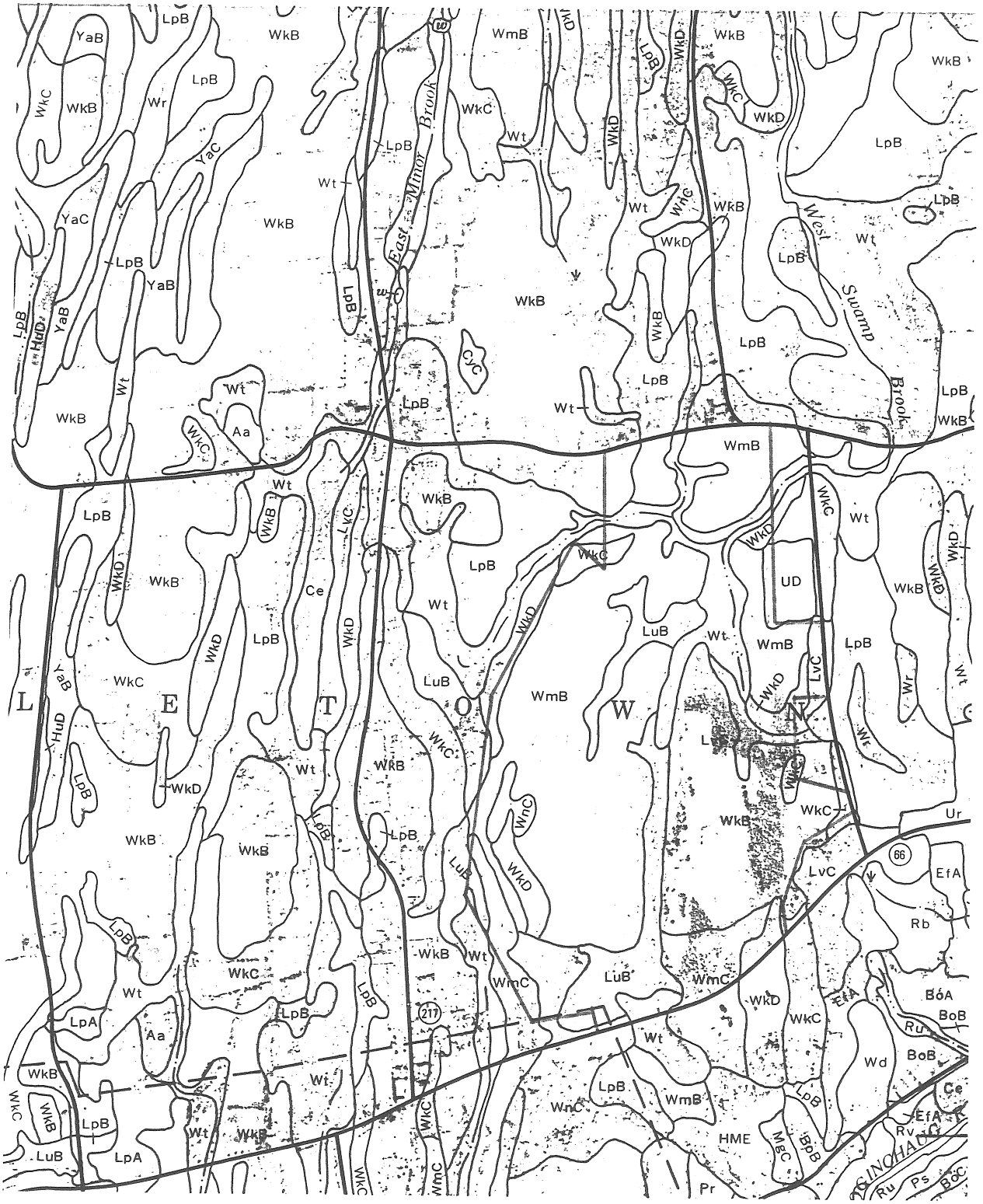
Soils Map

Scale 1″ = 1320′



Wetland Resources

1. Introduction

The Camp Property exists on a local watershed boundary separating the Coginchaug River and the West Swamp Brook which feeds into the Mattabesset River. The southern quarter of the site drains to an intermittent stream which flows under State Route 66 then becomes a perennial stream and enters Starr Mill Pond on the Coginchaug River approximately 3000 feet from the subject parcel. The northern three-quarters of the site forms the extreme headwaters of West Swamp Brook which, as a perennial stream, flows off the northeast corner of the site under Camp Street.

2. Wetland and Watercourse Habitats

The site contains a variety of interesting wetland and watercourse habitats including open water ponds, littoral marshes, forested wetlands, riparian forested wetlands, a potential vernal pool and a significant length of perennial watercourse. The southern drainage contains a small excavated pond approximately one tenth of an acre in size and located 1000 feet due north of the CFPA headquarters. This pond is probably too permanent and deep to be considered a vernal pool. However, approximately 1500 feet northeast of the CFPA headquarters exists a relatively large wooded wetland depression which exhibits many characteristics of a classic vernal pool. Vernal pools are small, shallow, circular depressions in the landscape which fill with water during periods of high Spring meltwater and storm-water runoff, becoming drier during the warm summer months. True vernal pools support abundant and diverse wildlife populations. Much of this wildlife is dependent on these areas for one or more periods of their life cycle. Because of the absence of permanent water, fish do not live in these ephemeral pools, making these areas very attractive to invertebrate and amphibian populations. The possibility that

rare and endangered wildlife can be found in these pools is significant. Additionally, being an area of such high biological productivity, vernal pools provide an abundant source of food for upland wildlife species. At the time of the site visit (July), the pool was in the process of drying up and was restricted to the deeper central portion of the depression, with indications of recent inundation on the lesser sloped area surrounding it. The pool does receive overland flow from a wooded wetland stretching off for a distance of approximately 400 feet to the north of the pool and appears to outlet water in a sheet-flow pattern over a broad, flat area of wetland extending to the southeast. As the slope in the outlet area begins to steepen, intermittent channels form carrying flow under the private driveway, to drain toward Starr Millpond. The surest way to confirm the presence of a true vernal pool is to conduct a Springtime biological survey with hopes of identifying certain "obligatory" species which exist only in vernal pools, including Fairy Shrimp, Wood Frog and certain types of "mole" salamanders such as the Blue-spotted, Jeffersonian and Marbled Salamanders.

The larger of two ponds (Hidden Pond) at approximately half an acre is located in the middle of the site. This pond receives flow from the south from the wetland described immediately below. An earthen embankment on the north side of the pond impounds the water, while an emergency spillway on the western end of the impoundment regulates the pond level. This pond appeared very "healthy" with appropriate levels of algal growth and a diverse pond bottom (benthic) vegetation. The eastern half of the pond's perimeter was naturally wooded while the western half was maintained.

The linear, wooded wetland system located south of the pond and continuing to Route 66 is situated at the base of a long, symmetrical hill with a north to south alignment which appears to be very characteristic of a drumlin. This wetland system is unique because it contains the watershed divide between the Coginchaug River and the West Swamp Brook referred to earlier in the section. The divide appears to be located where the private driveway crosses it perpendicularly. North of the drive

the water flows to Hidden Pond and south of the drive it flows to Route 66. This wetland system is a good example of a "seepage" wetland which receives most of its water where groundwater "breaks out" due to its location at the bottom of a slope or as in other situations, where some geologic condition impedes the flow of groundwater causing it to break out onto the surface.

The last wetland resource on this parcel is the extensive network of watercourses draining the northern third of the site. These streams and drainage ways form the headwaters of West Swamp Brook. Some of these streams are flanked by wetlands that form an extension of the watercourse and as such are "riparian" in nature. Their intricate pattern thoroughly dissects this portion of the property creating a diverse mix of upland and riverine habitats.

3. Educational Value

The variety of wetland offers many opportunities to provide valuable lessons in wetland science and watershed management. The existence of a local watershed divide with a wetland/watercourse traversing that divide is uncommon and could be capitalized upon for its educational value. Standing on the private driveway with a group of students and demonstrating how the water on either side of the drive ends up in different watersheds and then expanding this concept for them to include the rest of the drainage divide as it exists on the property would be a good beginning for a watershed lesson. The concept of the watershed, land use practices within this watershed and its effect on water quality could then follow. This exercise would serve to demonstrate the inter-connectiveness of our environment and how human actions at one location may have an unforeseen result at another location.

Additionally, the importance of vernal pools could be demonstrated by emphasizing how such relatively small wetland areas can be exclusively responsible for or

critically important to the existence of several wildlife species. However, access to the vernal pool should be planned and monitored due to the sensitive nature of these features. A boardwalk constructed from its outer edge into the central pool would be recommended.

Perhaps the most popular of wetland education sites are ponds. The larger of the two ponds on this site with its high water quality could be a well-utilized educational resource. For more information on specific environmental education programs which could be used in conjunction with this site please contact our Education & Publications Office at (860) 424-3542.

Figure 7

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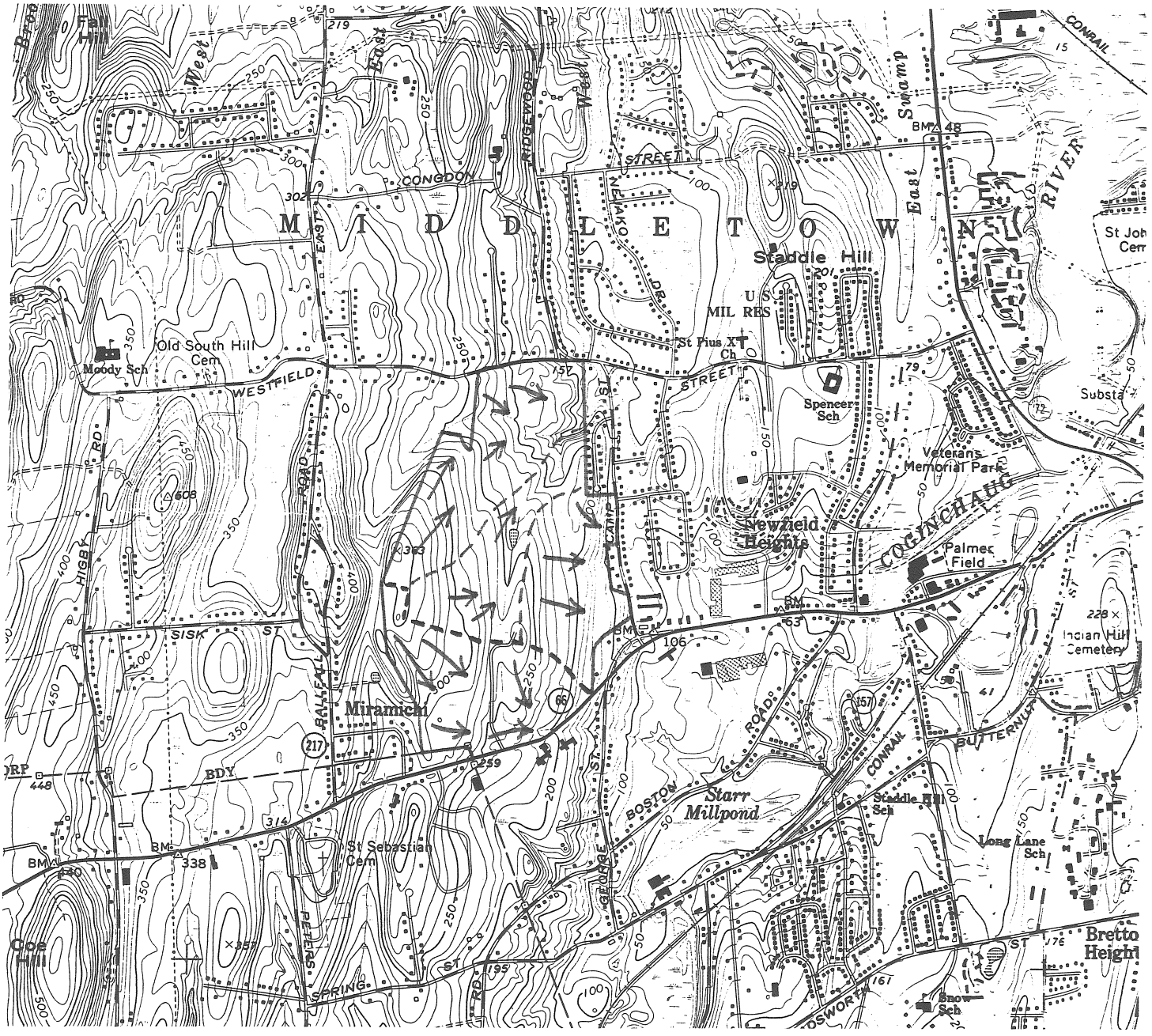
Watershed Boundary Map

Scale 1" = 2000'

Watershed Boundary
Direction of Flow
Project Site Boundary



Natural Diversity Data Base

The Natural Diversity Data Base maps and files regarding the project area have been reviewed. According to Data Base information, there are no known extant populations of Federal or State Endangered, Threatened or Special Concern Species that occur 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. Consultations 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.

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.

Forestry and Vegetation

The Camp Property, also known as the *Highlawn Tree Farm*, has been intensively managed by Connwood, Inc. Foresters on a continuous basis since the early 1960's. In the previous three and a half decades management has focused on the maintenance and improvement of the visual appearance of the forest; improvement of forest access; improvement of habitat for wildlife; production of sawtimber and fuelwood; production of Christmas trees; and, enhancement of the utility of the property for environmental purposes. Excellent potential exists for the development of this tract into a model *Outdoor Classroom and Stewardship Demonstration Forest*. This demonstration forest would provide environmental education opportunities which have value to all ages.

1. Vegetation

The vegetation present on this tract of land falls into several broad categories. These include Mixed Hardwoods, Hardwood Swamp/Inland Wetland, Conifer Plantations, Mixed Hardwood/Hemlock, Open Field and Old Field/Shrub areas which include the area around Hidden Pond. The location and acreage of these areas were obtained from 1990 aerial photographs and are only approximate. They are depicted on the Forest Vegetation Map. For more in-depth forest stand descriptions and past management practices please refer to the May 1986 *Forest Inventory & Management Report* prepared by Connwood Inc. Foresters (a copy may be found in the appendix).

A. Mixed Hardwoods: The Mixed Hardwood type totals approximately 174 acres and was divided into ten distinct forest stands for management purposes in the above noted *Forest Inventory and Management Report*.

Overall this vegetation type 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.) which range from 50 to 120 years of age. The majority of this forest type is dominated by red oak, black oak and white oak with chestnut oak, scarlet oak, red maple, black birch, mockernut hickory, pignut hickory, shagbark hickory and American beech present in lesser numbers. Tulip tree, sugar maple, black cherry, sassafras, Norway maple, white ash and yellow birch are more conspicuous components in the eastern half of this forest type and in close proximity to wetland soils. Understory vegetation includes hardwood tree seedlings, flowering dogwood, maple leaved viburnum, eastern hophornbeam, American hornbeam, azalea, beaked hazelnut, American chestnut sprouts, witch-hazel, highbush blueberry, lowbush blueberry, huckleberry and barberry.

Of special concern are several invasive exotic plants which have become major components in the understory in the area surrounding the homestead. These include Japanese maple, Norway maple, winged euonymous and round-leaved bittersweet. In some areas the presence of one or more of these species has precluded the establishment of other more desirable native species.

Ground cover vegetation includes poison ivy, Virginia creeper, green briar, raspberry, dewberry, partridge berry, Canada mayflower, wood aster, rattlesnake plantain, spotted wintergreen, pipsissewa, Indian cucumber-root, trout-lily, wild onion, false Solomon's-seal, wild sarsaparilla, club moss, evergreen wood fern, hayscented fern, cinnamon fern, Christmas fern and many other species of grasses, sedges and wild flowers.

B. Hardwood Swamp/Inland Wetland: There are approximately 13 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 and yellow birch. 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 and swamp rose. Skunk cabbage, false hellebore, tussock sedge, club moss, horsetail, sphagnum moss, poison ivy, green briar, cinnamon fern, Christmas fern, sensitive fern, 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. Norway Spruce/Larch Plantation: Several Norway Spruce and Larch plantations which total approximately 12 acres were planted for future timber production in the early 1960's. These plantations have had several pre-commercial thinnings and have been pruned to approximately six feet to improve visibility and access through the stand and to reduce the fire hazard. "Crop Trees" have been selected and released.

D. White Pine Plantation: Approximately 8 acres of White Pine were established on open fields in 1961. These plantations have been intensively managed to produce high-value sawtimber for the future. Several pre-commercial thinnings have been implemented along with "Crop Tree" pruning to a height of 17 feet.

E. Mixed Hardwood/Hemlock: Eastern Hemlock was under planted during the mid-sixties to the mid-seventies throughout much of this entire tract. Only about 7 acres have survived. The mixed hardwood overstory is identical to the mixed hardwood type described above. The understory is dominated by sapling size hemlock. The ground cover vegetation is sparse where the

hemlock has become established. Eastern red cedar is present in the understory in the portion of this area which is adjacent to Route 66. A slight infestation of Hemlock Woolly Adelgid was observed during the field investigation. The hemlock which are present are not large enough to be salvaged should wide spread mortality occur as a result of the Adelgid infestation. These trees if left standing will have excellent value for wildlife as soft snags.

F. White Pine/Larch Plantation: White Pine and Larch were planted in 1975 in a 1 to 1 ratio on approximately 7 acres. Pre-commercial thinnings which have been implemented have mainly been focused on the removal of the larch which were competing with white pine crop trees. At present bittersweet is restricting the growth and development of many of the crop trees.

G. Christmas Tree Plantation: There are approximately 5 acres of Christmas Tree Plantations present on this tract. These were originally established during the early 1960's with white spruce. Through the years, as trees have been harvested, they have been replaced with white spruce, Colorado blue spruce, Douglas Fir and more recently Fraser Fir.

H. Open Field: An Open field which totals approximately 4 acres is maintained on this property. Periodic mowing discourages the establishment of woody vegetation allowing the grasses, wildflower and weed species to maintain dominance.

I. Old Field/Shrub Area: About 3 acres of Old Fields, in which shrub and tree species such as autumn olive, multiflora rose, highbush blueberry, arrowwood, assorted viburnums, eastern red cedar, flowering dogwood, cherry and other hardwoods have become established, are present. Portions of

these areas, especially around Hidden Pond are mowed periodically allowing the grasses and herbaceous vegetation to remain dominant.

J. Hidden Pond: This one acre pond was constructed in the mid 1970's to provide a source of water for fire suppression. The vegetation around the perimeter of the pond is mowed periodically to discourage the encroachment of hardwood vegetation. See **I.** above for a brief description of the vegetation present around the perimeter of the pond.

K. White Spruce Plantation: A pure stand of White Spruce which totals less than one third of an acre is present to the east of the open field. Crop trees have been released and competing hardwoods have been removed.

2. Model Demonstration Forest

As stated earlier this tract has excellent potential for the development of a model *Outdoor Classroom and Stewardship Demonstration Forest*. It has been actively managed by Connwood Inc. Foresters for decades. There is no reason why this management should not continue. However, management strategies may have to be modified from the existing plans to meet the new objectives.

Funding for the development of this project may be available from many sources. Educational grants, the Stewardship Incentive Program, private gifts and revenues, however modest, from proposed future sawtimber harvests should all be investigated.

3. Suggestions

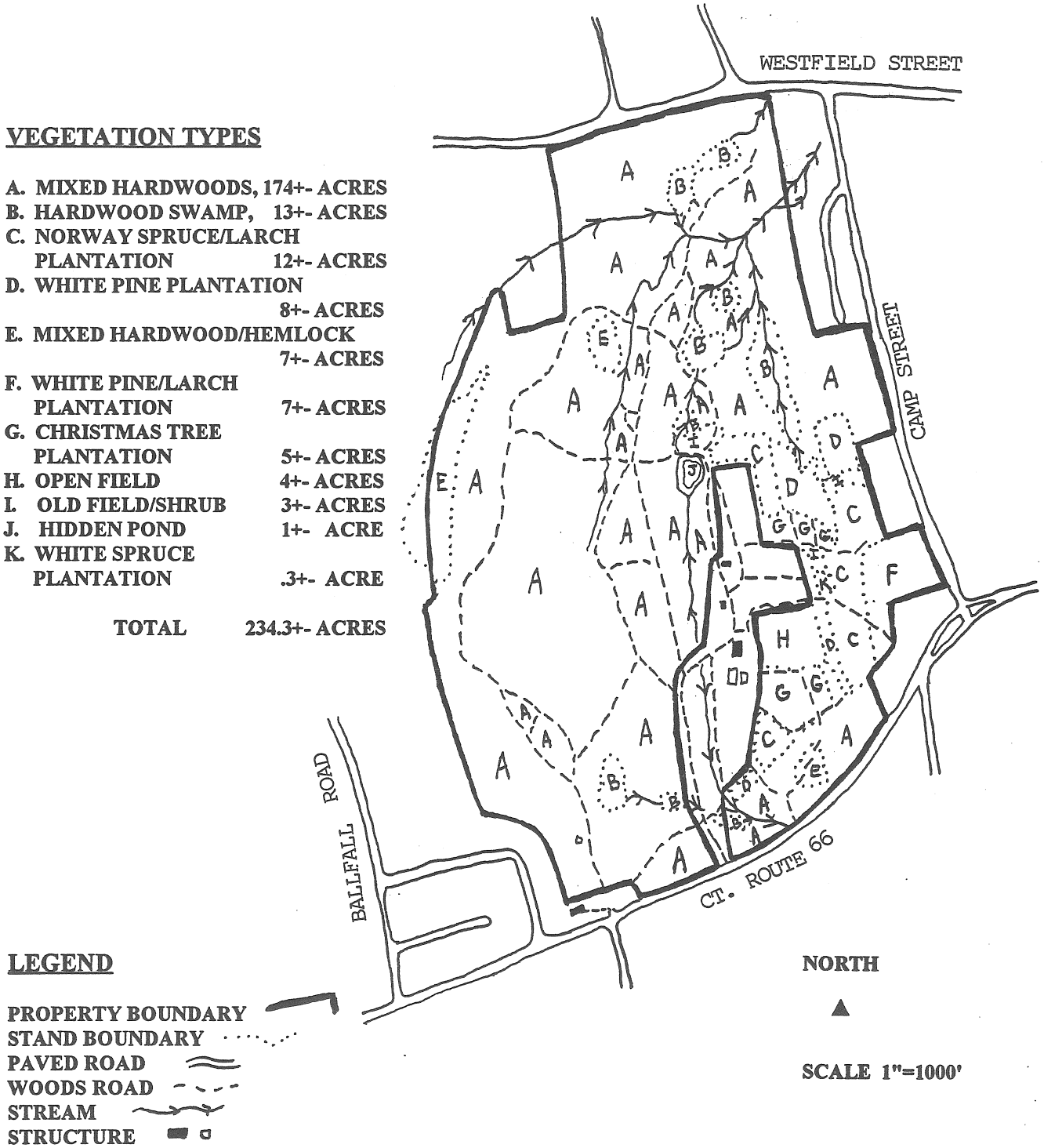
- As a result of the uniform nature of the forest in close proximity to the CFPA Headquarters it will probably be necessary to improve vehicular access to a more central location. Relatively minor improvements to the woods road which originates at the CFPA parking lot and travels north to the center of the property could be made to accommodate school busses. The construction of a gravel parking lot at this central location would allow walking access to a variety of existing vegetative conditions. These include managed mixed hardwood stands, hardwood swamp areas, riparian zones, managed Christmas tree and conifer plantations, old field areas and Hidden Pond.

- Areas that demonstrate forest stewardship if not pre-existing could easily be developed. Forest management practices such as timber stand improvement, crop tree management, thinning for fuelwood and sawtimber production, shelterwood harvests, final harvests, planting, exotic plant removal, erosion control and proper wetland/stream crossings could all be demonstrated. Wildlife habitat enhancement, tree identification and forest succession could also be demonstrated in this area.

- Forests are dynamic, living systems that are ever changing through time. Planning, development and maintenance of the demonstration areas will be an on-going project. Foresters are available from the Connecticut DEP Division of Forestry to assist with this project on a more in-depth technical level as it progresses.

Figure 8

Forest Vegetation Map



VEGETATION TYPES

A. MIXED HARDWOODS,	174+- ACRES
B. HARDWOOD SWAMP,	13+- ACRES
C. NORWAY SPRUCE/LARCH PLANTATION	12+- ACRES
D. WHITE PINE PLANTATION	8+- ACRES
E. MIXED HARDWOOD/HEMLOCK	7+- ACRES
F. WHITE PINE/LARCH PLANTATION	7+- ACRES
G. CHRISTMAS TREE PLANTATION	5+- ACRES
H. OPEN FIELD	4+- ACRES
I. OLD FIELD/SHRUB	3+- ACRES
J. HIDDEN POND	1+- ACRE
K. WHITE SPRUCE PLANTATION	.3+- ACRE
TOTAL	234.3+- ACRES

LEGEND

PROPERTY BOUNDARY
STAND BOUNDARY
PAVED ROAD
WOODS ROAD
STREAM
STRUCTURE

Wildlife Resources

1. Introduction

The predominantly mixed hardwood forest and associated vegetative types of the Camp Property provides habitat for wildlife in an urbanized region of the state. Although it contains limited vegetative structural diversity due to the predominance of an even-aged managed forest, it has the potential to serve as a place to demonstrate modern forest management practices. Large forested parcels, such as the Camp property, will increase in value over time as important refugia or reserves for forest-dwelling wildlife in an urbanizing region of the state.

2. Current Conditions

While conducting two site visits on the property on July 25 and September 4, 1996, the following wildlife were observed: White-tailed deer (*Odocoileus virginianus),* Gray squirrel *(Sciurus carolinensis),* Red-tailed hawk (*Buteo jamaicensis),* American robin *(Turdus migratorius),* Wood thrush *(Hylocichla mustelina),* Eastern wood-pewee *(Contopus virens),* Downy woodpecker *(Picoides pubescens),* Black-capped chickadee *(Parus atricapillus),* Tufted titmouse (*Parus bicolor*), American goldfinch (*Carduelis tristis),* Blue jay *(Cyanocitta cristata), Wood frog (Rana sylvatica),* Pickerel frog *(Rana palustris).* Indirect observations of wildlife sign were made of Wild turkey *(Meleagris gallopavo)* (feather and dusting area), Raccoon (*Pryocyon lotor),* and Sharpshinned hawk *(Accipiter striatus)* (feather). Field inspections for this report were done after peak nesting periods for most wildlife. Unfortunately there aren't any records of historical wildlife surveys for the property.

Mixed Hardwood

The property is comprised of mostly mixed hardwoods (174 acres) which are fairly evenly aged except for pockets that were recently logged. This forest type has

received thinnings and other forest management over the years according to the *Forest Inventory and Management Report* (1986). Many of the less desirable trees and dead trees were removed. Judging from field inspections, the size, structure, and plant species composition of the habitat type could be favorable breeding habitat for some of Connecticut's interior forest bird species such as the Red-eyed Vireo (*Vireo olivaceus*), Oven bird *(Seiurus motacilla),* and Wood thrush *(Hyocichla mustelina).* As most of the surrounding landscape transforms into suburban/urban landuse, this relatively large forest type is going to be unique and gain in regional importance. There is a distinct lack of sapling-pole tree size classes which limits its overall value for wildlife. The forest surrounding the homestead is experiencing an increase in exotic plant establishment from some of the ornamentals such as Norway maple *(Acer platanoides),* Japanese maple (*Acer palmatum*) and Winged Euonymus (*Euonymus salata).*

Hardwood Swamp/Inland Wetland

This area is comprised of about 13 acres in scattered pockets. Although these areas were not delineated in the *Forest Inventory and Management Report* , they deserve to be independently identified because they add plant diversity and serve as micro-habitats for amphibians and other wildlife. The red maples which are known to grow in the moist areas tend to develop hollow interiors and cavities for wildlife.

Mixed Hardwood/Hemlock

This forest type is in trouble in some areas of Connecticut because of the defoliating effects to the Eastern hemlock of the Woolly Adelgid insect pest. The interspersion of the shade tolerant Eastern hemlock provides valuable winter cover and shelter for wildlife.

White Pine

This 8 acre plantation adds habitat diversity to the predominantly deciduous forest on the property. This stand has been managed with an eye for quality sawtimber and has a reduced wildlife habitat value, however the White pine seed source is an

added food source for wildlife. The lack of understory and mid-story vegetation in the stand limits its wildlife cover value.

Mixed Conifer (White pine/Larch/Norway spruce)

This 7 acre area adds diversity and winter cover value. The Norway spruces are especially valuable as winter cover and shelter for wildlife. These conifers are beneficial in diversifying the food sources and adding winter cover values to the property.

Christmas Tree Plantation

This intensively managed area serves as habitat for a wide variety of generalist wildlife species. The man-made habitat that is provided through the propagation of Christmas trees adds winter cover and mimics some of the shrubland conditions. The dense evergreen component and shrubland environment is utilized by some small mammals and birds.

Open Field

This 4 acre open field adds diversity to this predominantly forested property. Wildlife species such as Wild Turkey and Eastern Meadowlark (*Sturnella magna)* benefit from these open field conditions. A valuable ecotone between the field and forest exists.

Old Field/Shrubland

This 3 acre area contains valuable brushy conditions and berry-producing shrubs and small trees. With the exception of the invasive Autumn olive (*Elaeagnus umbellata),* this area has a good mix of early successional forest plants. This vegetation type is becoming less common throughout the state.

Pond

This man-made pond provides the property with a permanent water source and habitat for fish, amphibians, and other associated wildlife.

3. Wildlife Habitat Management Considerations

Mixed Hardwood

A variety of wildlife habitat enhancement practices can be employed within this stand which can improve conditions for wildlife and also serve as demonstrations. An attempt at diversifying the size classes of' this stand should be a priority. Management of the invasive exotics is also needed.

- **Develop Areas with a Variety of Size Classes** - Three major tree size-classes should be developed in this stand: sapling-pole (<2.5cm dbh), sapling-pole (2.5 - 22.5cm dbh), and sawtimber (>22.5cm dbh). Areas of high stem density per unit area should be developed (i.e. sapling-pole size trees). High density stems per unit area are lacking and development of these can benefit wildlife

- **Creation of Temporary Openings** - Creation of temporary openings inside the forest should be about a half acre to an acre in size and targeted for areas with potential for increasing the berry production of understory vegetation. An attempt to keep these openings inside the forest rather than at the edge should be strived for.

- **Permanent Wildlife Food Plots** - These areas should be at least an acre in size and are made to increase unique food sources such as warm season grasses or winter grasses, forbs, and other beneficial food and cover products.

- **Creating Artificially Induced Snags** - There appears to be a lack of dead or dying trees throughout the property. A goal of at least 3-7 snags per acre should be strived for to enhance the habitat for snag dependent wildlife.

The *Forest Inventory and Management Report* report makes no mention of the creation or maintenance of snags.

Hardwood Swamp / Inland Wetland

These small moist forested areas should be improved by lightly thinning them, thereby increasing light to the understory shrubs to increase soft mast production and increase stem density.

Mixed Hardwood / Hemlock

This small pocket of Eastern hemlock mixed with hardwoods can be improved by releasing or thinning. Conditions should be improved to increase the size and density of the hemlock. Management of this area should also focus on the monitoring of the hemlock for insect infestations. An interspersion of other evergreen tree species such as Norway spruce, Red spruce and/or White spruce, which are woolly adelgid resistant, can be of benefit for future winter cover. This area can also serve to demonstrate deer damage abatement techniques such as tree shelters or deer proof fencing.

White Pine

This 8 acre plantation should be improved for wildlife by increasing the vertical structural diversity of the stand. A portion should remain heavily managed for sawtimber quality but other sections should be thinned in conjunction with an underplanting of White pine seedlings. Scarification of the soil following a thinning and good cone seed crop may encourage natural seedling development.

Mixed Conifer (White pine/Larch/Norway spruce)

This area should be managed to maintain dense winter cover through thinnings and hardwood tree removal by cutting or girdling of stems.

Christmas Tree Plantation

This area will maintain a moderate value for wildlife as nesting and winter cover.

Open Field

This 4 acre open field should be managed as a permanent herbaceous opening through periodic mowing. Mowing should not occur until after July 1st or later. The later the initial mowing the greater the likelihood that most ground nesters have finished incubating their eggs. Increased portions of the field left with unmowed herbaceous vegetation can be beneficial to wintering wildlife.

Old Field/Shrubland

This area should be maintained in an early successional habitat which is in decline in most of Connecticut. Removal of invasive exotics such as Autumn olive, Multiflora rose (*Rosa multiflora),* and Asiatic bittersweet *(Celastrus orbiculata)* can benefit the growing space of many of the native shrubs present.

Pond

The perimeter habitat of the pond can be improved by planting native shrubs such as Winterberry (*Ilex verticillata),* American Cranberry Bush Viburnum (*Viburnum trilobum),* Arrowwood Viburnum (*Viburnum recognitum),* Black Chokeberry (Aronia melanocarpa), Silky dogwood *(Cornus amomum),* and Red-osier dogwood *(Cornus sericea).* Some removal of invasive exotics may also be necessary.

White Spruce

This small patch of evergreen cover should be encouraged and enhanced through thinning and periodic removal of competing deciduous hardwoods.

4. Discussion and Other Considerations

The aforementioned habitat improvement suggestions for each habitat type can be employed to benefit the habitat and their associated wildlife. These suggestions and their subsequent implementation can be interpreted to the public via trail signs and /or trail guides. The habitat enhancements can be accomplished using modern forest stewardship practices and the forest products that are harvested can provide income for the project development. Many of the habitat improvement suggestions can be found in the Connecticut Forest Stewardship Incentive Program's Technical Specifications Manual. Wildlife that nest in cavities such a Gray squirrels, Eastern Screech owls (*Otus asio*), Black-capped chickadees, and Eastern bluebirds *(Sialia sialis)* can benefit from placement of artificial nest boxes in appropriate habitats throughout the property. Natural cavities appear to be limited throughout the property. The number and type of nest boxes can be determined by the Team wildlife biologist upon request. Artificial snags can be created through girdling of trees in appropriate habitats for cavity-dependent wildlife. The compatibility of forest management and wildlife habitat management can be a major component of the educational message for this *Forest Demonstration/Outdoor Classroom Area.* This property has an older forest management plan and thirty-plus years of on-the-ground forest management, which can be used as a starting point and modified accordingly. With proper planning and implementation, this property offers an excellent opportunity to showcase to the public the compatibility of forest management practices and wildlife habitat management.

5. Trail Layout

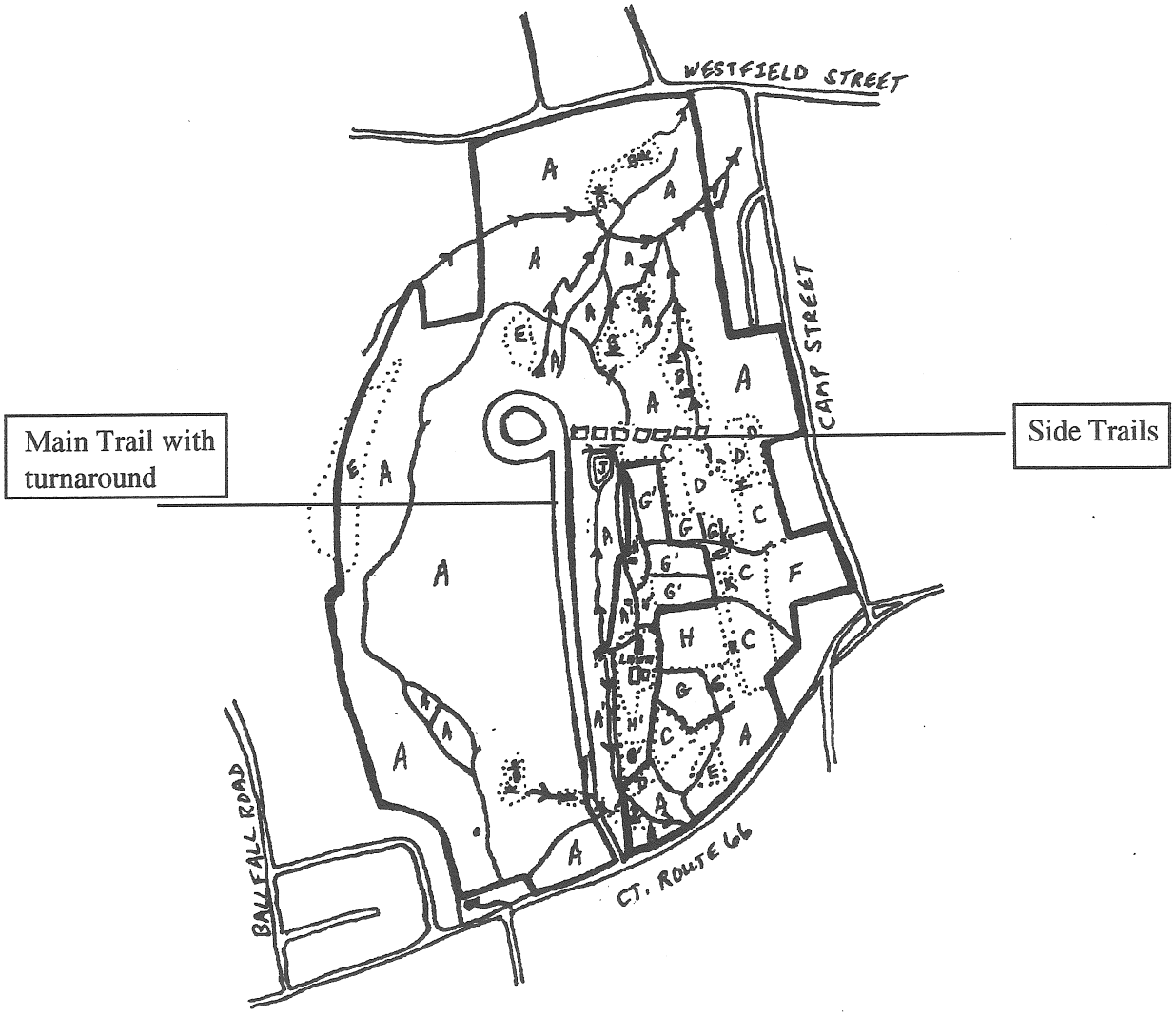
The trail layout and design should attempt to balance the need to have visitors see many demonstrations and the need for wildlife to have some refuge. Demonstration trails should have a main trail with a turnaround and smaller side trails (see Figure 9 for hypothetical trail map). West of the main trail there can be forest demonstrations of various tree size-classes with side trails going to various

points of interest. The main trail should be well developed for vehicular traffic, but side trails should be for lighter use. The DEP Wildlife Division has developed a demonstration area at its Session Woods Wildlife Management Area in Burlington which can be visited by the CFPA planning committee to gather more information and gain some insights on how it was developed. The demonstrations on the trails are demarcated using laminated signs and an accompanying trail guide. The Team wildlife biologist is available for future consultation throughout the various phases of the development of this project.

Figure 9

Hypothetical Layout of Main Trail

(See Forestry and Vegetation section for forest type symbols.)



Fisheries Resources

1. Resources

The man-made pond (Hidden Pond) on the property has been constructed within the headwaters or the uppermost section of the West Swamp Brook Watershed. This area of the stream is intermittent, meaning that it flows in direct response to precipitation or is seasonally dry. It does not support a viable fish community. One of the more important functions of this reach of stream is to provide clean and unpolluted waters to downstream areas of the watershed which supports an increased diversity of aquatic organisms. No recent fisheries survey information is available within the West Swamp Brook Watershed however, based on a field review of physical instream and riparian resources and from known fisheries data in adjacent watersheds, the following freshwater finfish should be found in lower reaches of West Swamp Brook: blacknose dace, fallfish, white sucker, tessellated darter, redfin pickerel and golden shiner. Chain pickerel would be the dominant gamefish and panfish such as bluegill, pumpkinseed, and redbreast sunfish should be present. American eel, a species which exhibits catadromous migratory behavior should also be very common.

The pond contains fairly uniform shallow water habitat which lacks structure and diversity. Although not positively identified, the submerged aquatic vegetation that is prevalent in the pond appears to be a member of the stonewart family, an advanced form of algae. Filamentous algae are also common. The pond is expected to support a small population of warmwater freshwater fish. Warmwater fish can survive in water temperatures that exceed 75° F for extended periods of the year. Largemouth bass was the only fish species observed the day of the field review. Along with largemouth bass, this pond may support members of the sunfish and bullhead family.

2. Recommendations

- **Aquatic Education** - The unnamed watercourse and man-made pond could serve as valuable ecological study areas. Aspects of stream ecology such as water quality and the aquatic invertebrate community could be monitored. Identification of streamside riparian vegetation and the important role riparian ecosystems play in protecting watercourses could also be studied.

  The pond provides multiple opportunities to study the eutrophication or aging process through water quality analysis. Identification, abundance, and life history of aquatic vegetation, zooplankton, phytoplankton, and fish populations could also be investigated. Food web and trophic relationships could be identified. Water quality and aquatic community comparisons could be made between stream and pond habitats.

  To learn more about small pond management, the following publication which is available from the CT DEP Natural Resources Center may be of interest; *Small Ponds in Connecticut: A Guide for Fish Management.*

- **Habitat Improvement** - Habitat improvements should be considered since the pond contains fairly uniform shallow water habitat which lacks structure and diversity. Because of the marked affinity fish have for cover, habitat improvements in the form of additional cover can provide areas in which fish can hide to avoid predation. Improvement designs are fairly simple and most often include structures such as: fallen trees, brush piles and large rocks. Structures are installed either on the bottom or float on the surface. Upon request, the Team's fisheries biologist can provide further technical guidance.

- **Bridge Replacement** - To help facilitate access around the pond, the existing wooden bridge which spans over the inlet to the pond should be either repaired or replaced.

Outdoor and Environmental Education

1. General Program Comments/Target Audiences

According to described plans for the property and discussions with the staff and board members, the intended use of the property is to draw visitors to the site for the purpose of providing an educational experience that focuses on forest management and forest ecosystems. CFPA would like to pattern the development of the site and the educational programming after the James River Timber Corporation's Project Learning Tree Outdoor Classroom & Demonstration Forest which is located in the state of Maine.

The property lends itself very well to this kind of program design where specific areas throughout the property are identified based upon some special characteristics that either demonstrate or allow learners to investigate forestry and wildlife issues/topics and study various habitats such as wetlands, upland forests, open fields and ponds. Although the property is primarily dominated by an even-aged stand of mixed hardwoods, there are some areas that could easily serve as outdoor classroom sites such as the large pond, the Christmas tree plantation, the spruce/larch stand and the white pine stand - all located within an easy walking distance of Hidden Pond. Each one of these areas could lend itself well to describing forestry management techniques for the purpose of propagating certain species of trees for harvesting.

There are other areas on the property that could easily be modified to provide some demonstration areas where forestry and wildlife habitat enhancement practices could be viewed and studied by visitors.

Target audiences appear to be students/teachers, landowners and natural resource professionals. Each of these groups will require specific kinds of educational programming that will meet their individual needs, however, design characteristics and requirements for the property will not change based upon target audiences. For example, demonstration areas and outdoor classroom sites mentioned above can be used for programs for both students and landowners with obvious modifications of the educational approach and methodology.

After reviewing the Learning Guide from the James River Timber Corporation's Outdoor Classroom & Demonstration Forest it is recommended that CFPA follow the program format and overall program design that is contained within this guide. The guide is well thought out and contains activities and supplemental information that would easily apply to stated program goals for the Camp property. By utilizing existing curriculum materials such as *Project Learning Tree, Project WILD, Project WILD Aquatics* and *Project WET,* along with modified specialized supplements such as the James River Timber Corporation's guide there should be no need to write new curriculum materials. The exception to this would be some very site specific needs that might be identified as the outdoor classrooms are developed.

Topics and issues related to forestry and wildlife management should be state specific, and should relate to the kinds of management methods and techniques that employed here in Connecticut. So even though there are existing curriculum materials that can be utilized, modifications or supplements to these materials should incorporate state specific examples and topics whenever possible.

2. Specific Recommendations

As an aid in identifying and referencing sites and design recommendations for the land described in this section please refer to Figure 10.

- **Outdoor Classroom / Demonstration Sites - Proposed "Intensive Use" Area**

The review of the land revealed several areas that could serve as effective Outdoor Classroom areas or demonstration sites. As stated earlier, the vast majority of the land is comprised of mixed hardwoods. Since there is currently no vehicular access into the property other than the private drive to the Camp residence, visitors will have to park in the CFPA parking lot and use the North Trail leading to the Outer Loop to get to an area that should be designated as an **intensive use area** (indicated on Figure 10), which is located in the vicinity of Hidden Pond.

Along this entrance road, there were several locations where demonstration sites or outdoor classrooms could be located. There should be several sites along the entrance path leading into the intensive use area that will allow visitors to study or view selected management practices. This will allow several groups to utilize the property simultaneously by giving them multiple locations to gather.

An intensive use area will allow groups to gather and study several kinds of natural features without lengthy walks that would use valuable instruction time. To accomplish this, it is suggested that the area immediately adjacent to and around the pond be developed into a central gathering point where classes can study a wide variety of habitats and managed areas. Specifically, study sites could include the pond; the small stream entering and exiting the pond; the associated wetlands downstream from the pond; the Norway Spruce/Larch stand; and some selected sites in the mixed hardwood stands

surrounding the pond. There is a diversity of habitats in this area that lends itself well to intensive use.

To get groups into this area in a timely manner it should be a consideration of CFPA to making the North Trail entrance and either the Outer Loop or the 1st Access Road a graded, improved dirt road that would allow access by vehicles to a parking area that could be located near the pond (see Figure 10). This would obviously be a very costly piece of work, but it would allow access to the heart of the property with ease thereby saving time for longer instructional periods.

If an entrance road is not a feasible alternative, then groups will have to gather in the CFPA parking lot and walk to the intensive use area which could take upwards of 15 minutes. Access to the more diverse areas of the property becomes an issue that needs to be addressed through proper program planning and site design.

• **Trails/Signs/Benches**

The trail conditions throughout the property are very good; they appear to have been dirt access roads wide enough to handle vehicular travel. For the most part there would be little need to regrade trails for walking, although in some areas that would be desirable, especially where there are some problems with runoff. In order to access a couple of the proposed study sites, such as the pond, the wetlands leading from the pond, the Norway spruce/larch stand (6A on Figure 10), some new trail construction would be required for proper access into these sites. Also, along the westerly side of the pond, an open area adjacent to a new trail should be created to allow easy access to the pond by students for collection and sampling purposes.

It is recommended that interpretive signs and even directional signs be used throughout the property; it is very easy to get lost on the property because of

the numerous roads and trails found throughout the area. At the designated demonstration/outdoor classroom sites signs would be a necessity. It appears that there would be a minimal concern of vandalism on this property since access is limited at the present time, although some consideration should be given to signs that are easily replaced or are more permanent and vandal proof. The content and topics of these signs will of course depend upon the nature of the demonstration/outdoor classroom site and how the message will tie into any curriculum objectives established by CFPA.

The placement of benches along the access trails and more elaborate seating in the designated outdoor classroom sites is a must. This kind of seating will not only allow visitors a place to rest during a walking visit to the property, but it will allow a somewhat controlled area to seat children and adults in specific areas where programs will be conducted and on-site instruction will take place. It is assumed that there will be a need to have students write or take notes while studying specific areas, so seating will be essential. Also, around the pond, the center of the intensive use area, an open sided shelter with tables would be an important element to add to the design considerations.

• Handicapped Access

This site does not lend itself well to accessibility by physically challenged individuals at the present time. A trail that could be used by this kind of a visitor would be very expensive to build and would have to meet strict ADA guidelines (guidelines are available for handicapped trail construction). There is the possibility of securing special funds for the construction of such a trail. This should be researched and pursued so that areas of the property will be accessible by all visitors.

3. Summation

The property has a great deal of potential. Although not as diverse as the Team outdoor education specialist would like to see it, with some selective cutting and a careful management plan that would allow for the creation of some diversity within the property, it is believed that an excellent demonstration/outdoor classroom site can be created here.

There are some problems with access to the property, especially to a recommended intensive use area, that mainly concerns the time it would take for groups to get there; however, it is believed that this can be overcome with proper program design and some other design recommendations that have been stated in earlier in this section.

It is recommended that special curriculum not be written for use with the property, but rather that CFPA utilize a plethora of very good materials that already exist and modify them so that they discuss state specific concerns or site specific concerns. The connection of the proposed program offerings with the existing curriculum goals and objectives in the school systems most likely to utilize the property is essential. Also, teacher workshops that may be conducted by CFPA on the property will have to address the new curriculum standards being adopted statewide for academic achievement and teacher competencies while at the same time addressing the topics CFPA wants to get across to the public, students and teachers.

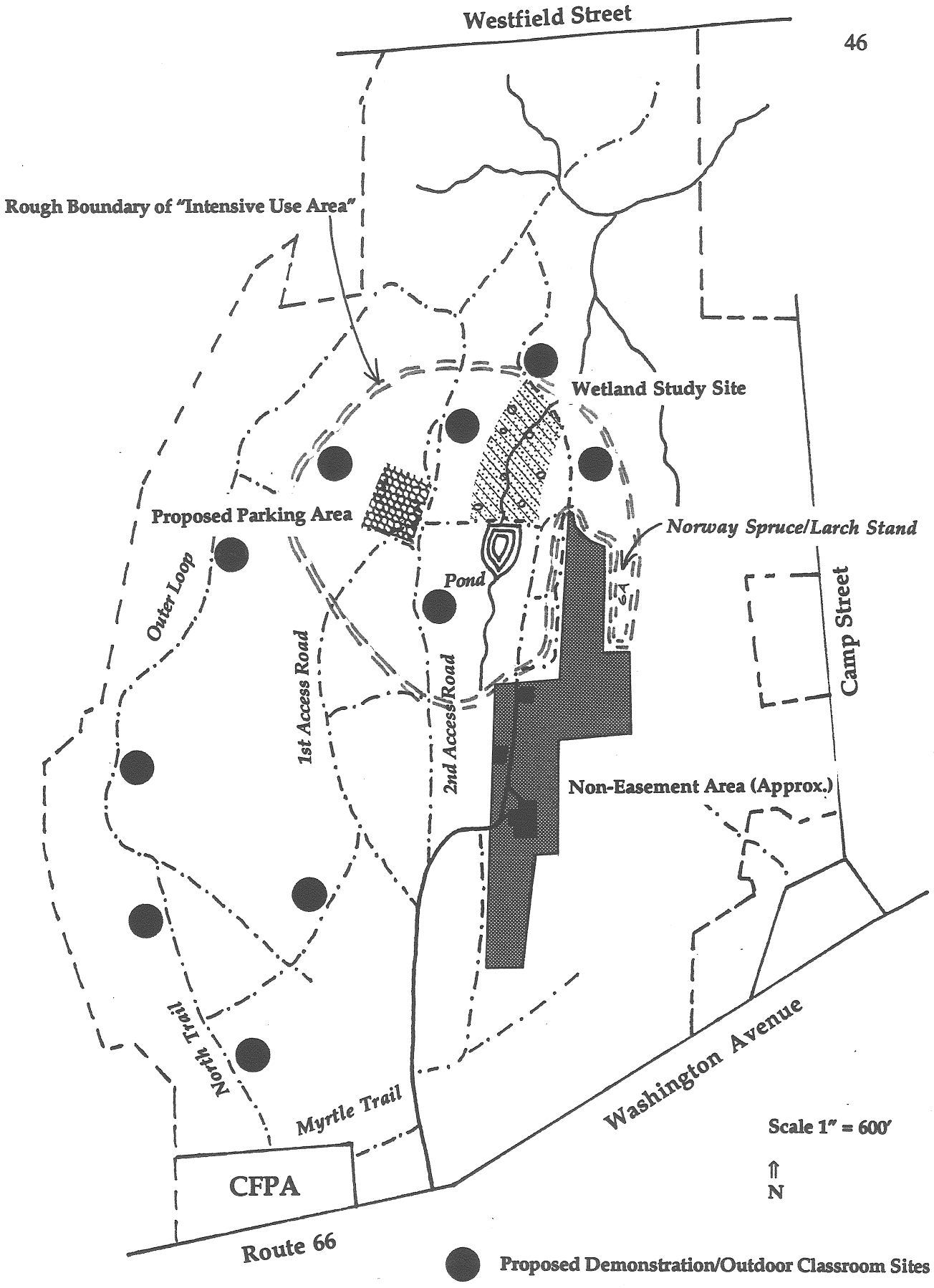


Figure 10

Outdoor and Environmental Education Map

State Park Planner Comments

Basic guidelines governing the future of the Camp property appear to include:

- The Camp Family retains fee ownership of the entire property and apparently exclusive use of a central section (approximate size indicated on Figure 11) containing a residence and associated outbuildings.

- The CFPA has a conservation easement on the entire property excluding the central section retained by the Camp Family.

- CFPA has been granted the right to operate an environmental education program within the easement portion of the property the scale and scope of which presumably would be subject to the approval of the Camp Family.

- General public access to the easement area is not envisioned.

- The Camp Family seemingly will retain management control of the tree farm operation on the entire property.

With these guidelines in place, the next step involves balancing the desires and sensibilities of the Camp Family with the needs of a viable environmental education program on the one hand and the site resources available for such a program on the other. Related to both is the management necessary to control public access.

Recognizing the need to protect the privacy of the donors and any future residents of the house should be a priority, for example to avoid the friction experienced at

the Nature Conservancy's Hart Property adjacent to Ragged Mountain in Southington. Therefore, the proposed educational program should to the maximum extent possible avoid the access road to the house, the exclusive use area retained by the Camp Family, open areas in view of the house, and in addition easement acres in visual proximity to the house which might encourage unwanted intrusion upon the privacy of the residents. In other words, "out of sight, out of mind" should be an operational principle.

The needs of the environmental education program include:

- The desirability of a "home base" including indoor facilities, a parking lot, and a controlled access point, all of which can be met at the CFPA headquarters.

- A variety of natural features including water, wetland and different vegetation types. Clearly the most interesting locale involves the acreage surrounding the Hidden Pond and immediately easterly of the pond. In addition to the pond and nearby wetland, vegetation types include a deciduous forest, mixed coniferous plantation, white pine plantation, and Christmas tree plantation.

- A trail system providing opportunity for nature walks, with a suggested system indicated on Figure 11 and designed to minimize physical and visual impact on the occupants of the Camp residence.

The related issue of effective management control or access to the property is partially met by utilizing the CFPA property as the sole access point as recommended above. In addition, recognizing the increasingly-developed character of the surrounding areas and the likelihood of trespass and possible vandalism, barriers must be maintained at all other trail or wood road entry points to the property, three of which are indicated on Figure 11. Similar internal barriers also are recommended as indicated to keep visitors on the approved trail system.

Two remaining issues need to be addressed. One relates to the desirability of busing students to the pond area to avoid the time factor involved in a reasonably long walk. Barring development of a vehicular roadway within the recommended trail system, vehicular access would necessitate using the access road to the Camp residence and visual proximity to the residence. This is a sensitive issue which would need to be negotiated with the Camps (and presumably any successive occupants).

Secondly, the non-easement area retained by the Camp Family extends further north than envisioned during the field inspection, including an area in close proximity to the pond and a Christmas tree plantation. As both features are considered key elements in the area to be the focal points of the proposed environmental education program, possible conflict between program needs and donors wishes should be anticipated and addressed.

Archaeological Sensitivity

A review of the State of Connecticut Archaeological Site Files and Maps show no known archaeological resource on the project area. Similarly field review suggests relatively few areas of topographic and environmental features usually associated with prehistoric Native American sites. The drainage system flowing south-to-north may have associated Indian campsites adjacent to the wetland, however, these sites would be small, temporary camps with limited archaeological visibility.

Historic European American resources are also limited on the project area. There are stone features and artifact distributions adjacent to Westfield Street in the northern portion of the property, however, historic ceramics, glass and other cultural materials recovered from this area appear to be associated with 20th century dumping activities and are of less historic significance.

Nonetheless, it is suggested that educational opportunities for school children and the general public can be considered for archaeological resources on the property. For example, changes in the land associated with forest management and other activities may leave stratigraphic transformations in the soil profile that can be investigated as part of the proposed training center for *Project Learning Tree* so that the educational experience can be below-ground as well as above.

The northern portion of the property can be used as an example of changing social and technological behavior associated with garbage disposal. For example, the recovery and dating of historic artifacts dumped on the property can be compared with modern recycling efforts and landfills to teach lessons on how our society has

had to modify the way we deal with waste as an environmental concern. The history of garbage disposal can be taught with archaeological methods. Stone features can be mapped by students to learn of the early history of Middletown and how that history still exists in below ground resources.

Finally, as part of *Project Learning Tree* the Office of State Archaeology can assist in developing outdoor lessons on Native American use of forest products. While archaeologists mostly recover stone tools, the Indians of the Eastern Woodland have adapted to forest environments for over 6,000 years and lessons on how they used the forest resources for wigwams, canoes, bows and arrows, spears, axes, food, hunting, etc. can be incorporated into the learning program. The diversity of Indian utilization of the forest environment can teach important lessons on the use of the forest in unique ways not demonstrated by modern usage.

The Office of State Archaeology serves as the public education coordinator for the Society for American Archaeology. In that capacity, they maintain class curriculums and lessons for promoting archaeology in the state. The CT Museum of Natural History provides migratory exhibits on archaeology and environmental subjects for educational purposes. These resources are available through their office and the museum. The Office of State Archaeology would be pleased to discuss any of these and other options that might be useful to the development of this project.

Appendix

For Appendix Information please contact
the ERT Office at 860-345-3977

ABOUT THE TEAM

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

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

PURPOSE OF THE TEAM

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

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

REQUESTING A REVIEW

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

For additional information and request forms regarding the Environmental Review Team please contact the ERT Coordinator: 860-345-3977, Eastern Connecticut RC&D Area, P.O. Box 70, Haddam, Connecticut 06438.