

Environmental Review Team Report

Coolidge Property
Plainfield, Connecticut

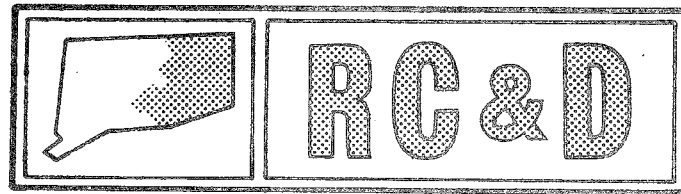


EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Environmental Review Team
Report

Coolidge Property
Plainfield, Connecticut

June 1983



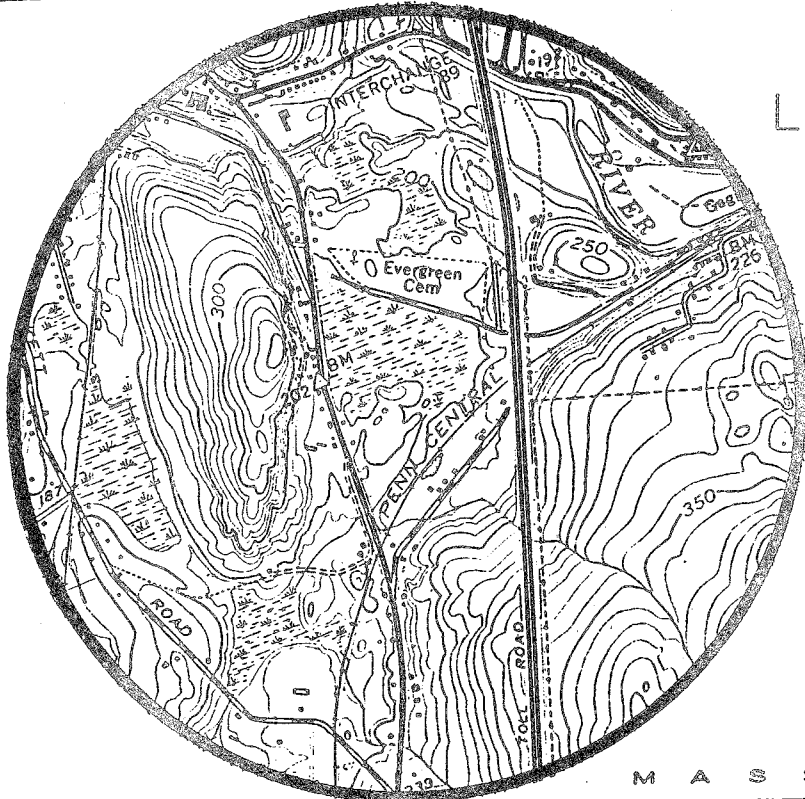
Eastern Connecticut Resource Conservation & Development Area

Environmental Review Team

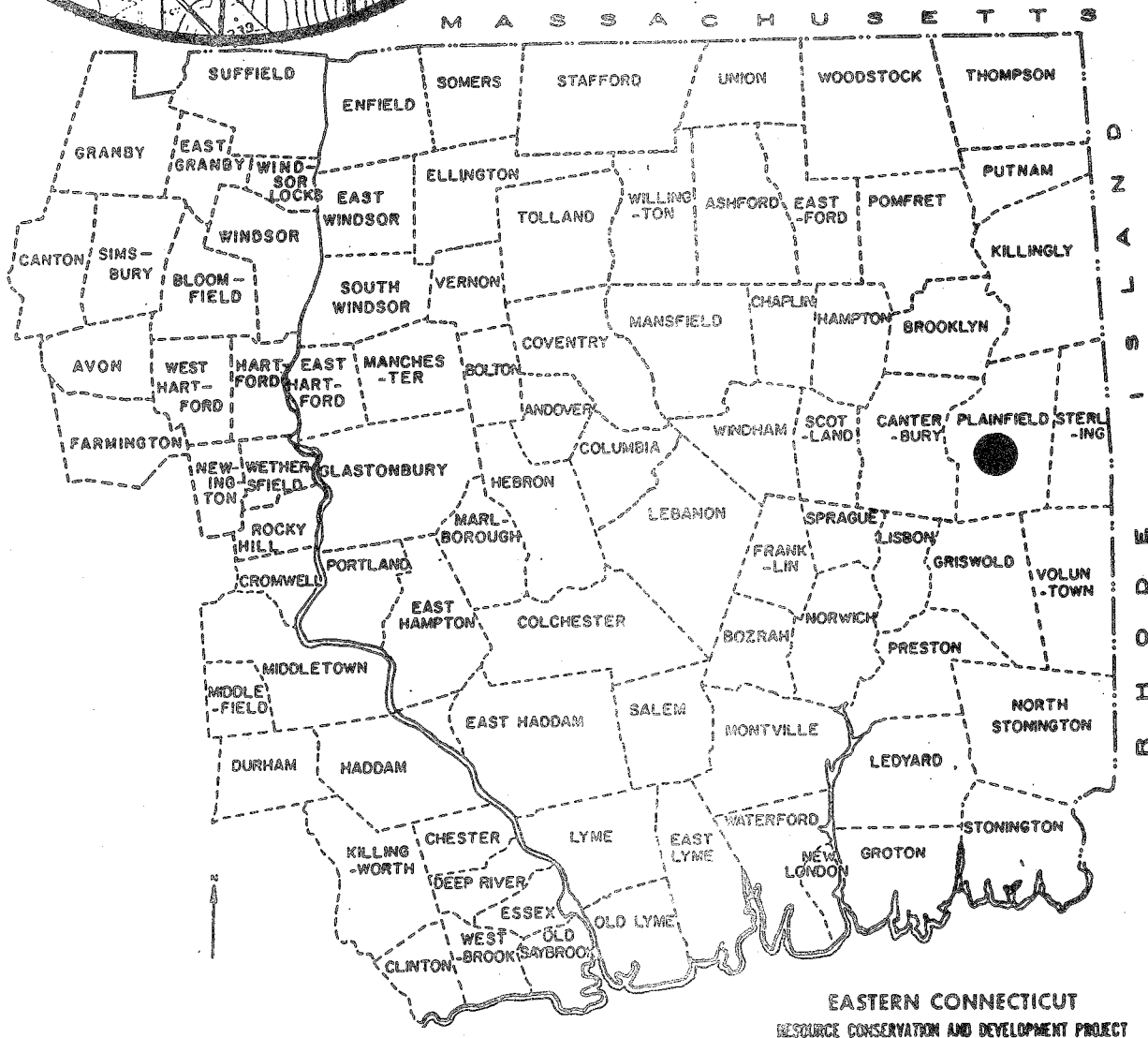
PO Box 198

Brooklyn, Connecticut 06234

Location of Study Site



COOLIDGE PROPERTY
PLAINFIELD, CONNECTICUT



EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ENVIRONMENTAL REVIEW TEAM REPORT
ON
COOLIDGE PROPERTY
PLAINFIELD, CONNECTICUT

This report is an outgrowth of a request from the First Selectman of Plainfield to the Windham County Soil and Water Conservation District (S&WCD). The S&WCD referred this request to the Eastern Connecticut Resource Conservation and Development (RC&D) Area Executive Committee for their consideration and approval. The request was approved by the RC&D Executive Committee and the measure was reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The soils of the site were mapped by a soil scientist from the United States Department of Agriculture, Soil Conservation Service (SCS). Reproductions of the soil survey map, a table of soils limitations for certain land uses and a topographic map showing property boundaries were distributed to all Team members prior to their review of the site.

The ERT that field-checked the site consisted of the following personnel: Howard Denslow, District Conservationist, Soil Conservation Service (SCS); Bill Warzecha, Geologist, Connecticut Department of Environmental Protection (DEP); Dick Raymond, Forester, DEP; Maureen Peters, Regional Planner, Northeastern Connecticut Regional Planning Agency (NECRPA); Don Capellaro, Sanitarian, State Department of Health; and Jeanne Shelburn, ERT Coordinator, Eastern Connecticut RC&D Area.

The Team met and field checked the site on Tuesday, February 15, 1983. Reports from each contributing member were sent to the ERT Coordinator for review and summarization for the final report.

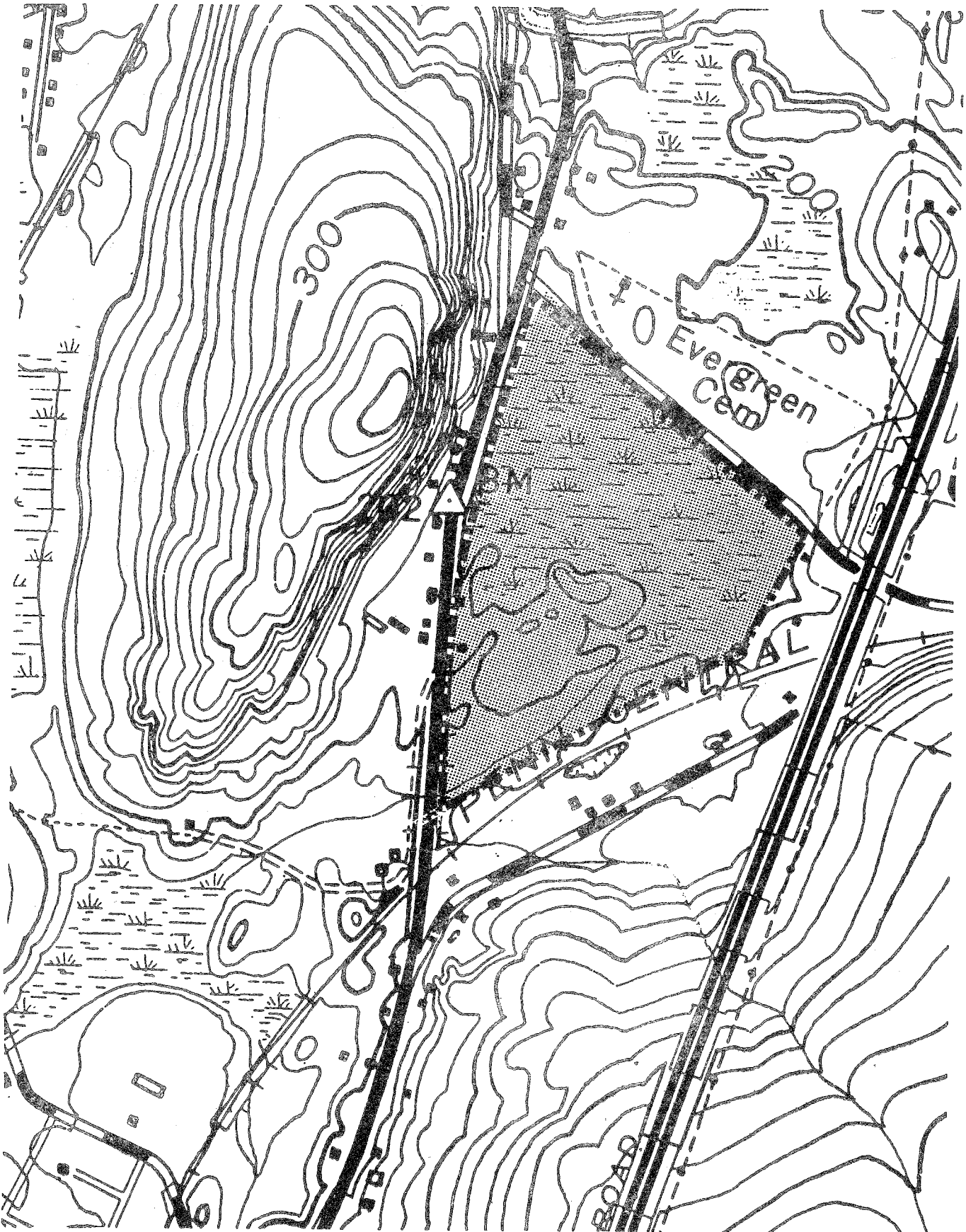
This report is not meant to compete with private consultants by supplying site designs or detailed solutions to development problems. This report identifies the existing resource base and evaluates its significance to the proposed development and also suggests considerations that should be of concern to the developer and the Town of Plainfield. The results of this Team action are oriented toward the development of a better environmental quality and the long-term economics of the land use.

The Eastern Connecticut RC&D Area Committee hopes that this report will be of value and assistance in making any decisions regarding this particular site.

If you require any additional information, please contact: Ms. Jeanne Shelburn, Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Brooklyn, Connecticut, 06234, 774-1253.

Topography

— Site Boundary



INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to prepare an environmental assessment for potential development on the Coolidge Property in Plainfield. The site is located south and east of the intersection of Route 12 and Evergreen Avenue. It is approximately 32 acres in size. Mr. Coolidge has donated a portion of the property to the Central Village Fire Department for construction of a new fire house. Land along the Route 12 frontage of the property has been filled and developed with several commercial enterprises. The remainder of the parcel is almost entirely a wetland, vegetated with Atlantic White Cedar which is a rare forest type within Connecticut. The wetland is fed by a high ground water table and runoff from a 312± acre watershed area. Several storm drain culverts outlet into the swamp from beneath Route 12 and Evergreen Avenue.

The property lies within the upper reaches of the Horse Brook watershed. Horse Brook flows to Plainfield crossing Route 14A beneath IKey's Cafe. This brook, along with Mill Brook, Fry Brook, and Lathrop Brook, contribute to the flooding problem at the industrial area in Plainfield. The watershed of all these brooks encompasses a major portion of Plainfield, and is currently being evaluated for flood prevention. Any commercial, industrial, or residential development within the watershed may increase the storm water runoff to one of the brooks and subsequently cause additional flooding. Potential increase in flooding caused by fringe development of the Coolidge wetland is of major concern to the Town. Hydrologic evaluation shows that such development would not significantly increase the stream flow at the outlet of the wetland. The total wetland area of approximately 30 acres does retain storm runoff from its 312 acre watershed by as much as 30 percent. That is, if the swamp were drained or removed, one could expect 30 percent more stream flow from the area. Developing the fringe areas may eliminate 5-10 acres at most, over time. As long as the majority of the swamp remained as a "big absorptive sponge", and no storm drainage was channeled to the outlet through the swamp, flow from the area would not increase significantly. This illustrates one benefit of a wetland - that of storing and retarding runoff.

The Team is concerned with the effect of potential development on the natural resource base of this site. Although many severe limitations to development, as seen on the Coolidge Property, can be overcome with proper engineering techniques, these measures can become costly, making a project financially unfeasible. The development limitations found to be characteristic of the site and potential mitigating measures are discussed in detail in the following sections of this report.

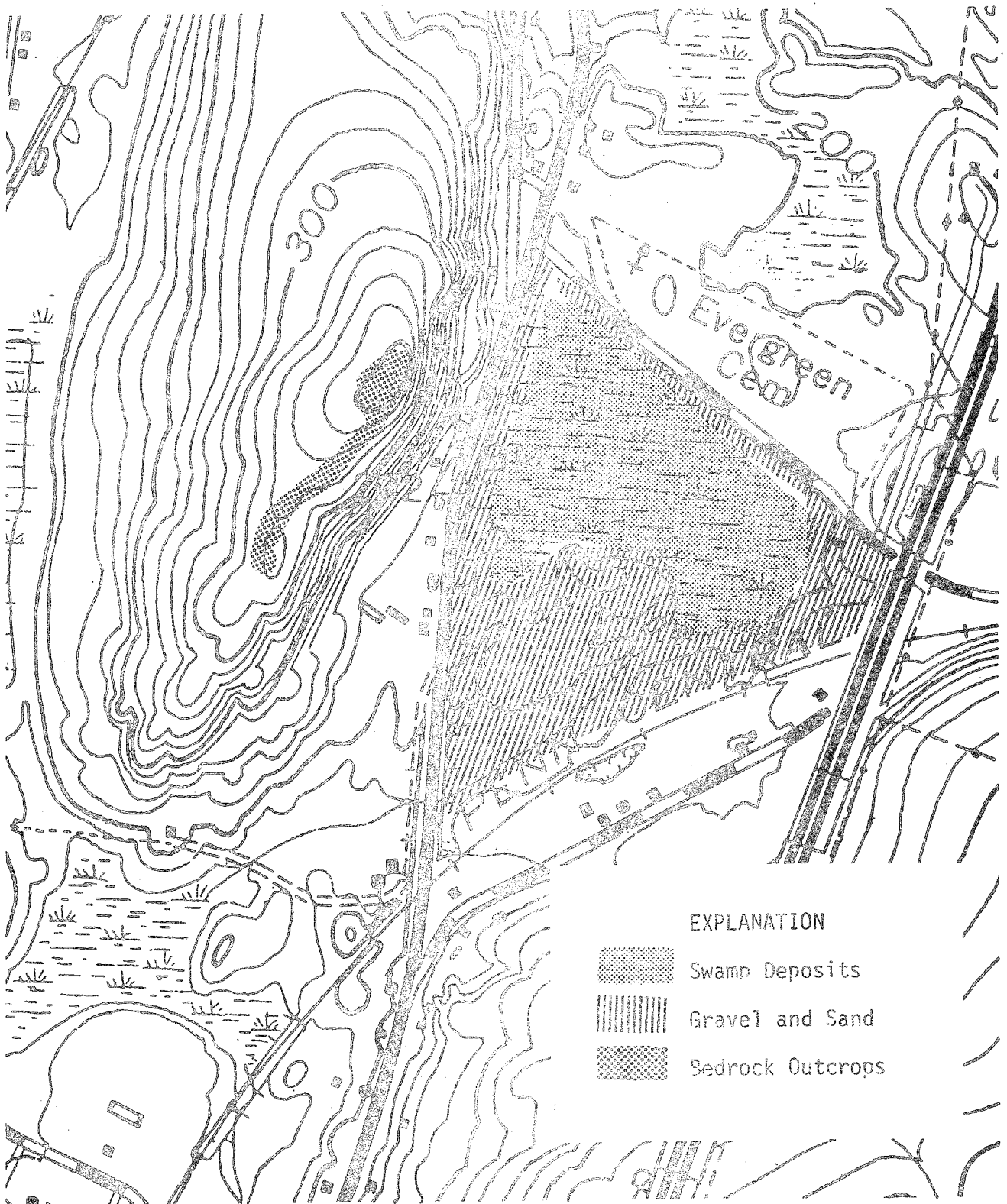
ENVIRONMENTAL ASSESSMENT

TOPOGRAPHY

The Coolidge Property consists of a 32± acre parcel south of the intersection of Route 12 and Evergreen Avenue in the Central Village section of Plainfield. It is almost entirely dominated by wetlands, except for a strip along Route 12 which has been filled for commercial development.

Surficial Geology

0 660
scale



Land surface elevation throughout the relatively flat parcel is approximately 200' above mean sea level. Elevation taken from the published Plainfield U.S. Geological Survey (1:24,000 scale) topographic map.

GEOLOGY

Although there were not outcrops observed on the site, bedrock underlying the site fall within the lower member of the Quinebaug Formation. This bedrock unit was probably mapped from outcroppings which can be observed a short distance west of the site.

The Quinebaug Formation can be described as a medium-to fine grained, well layered gneiss. It ranges in color from a light to dark greenish grey which is a result of the colors of the dominant minerals in the formation. Primary minerals found in the formation include quartz, plagioclase, epidote and biotite.

A "gneiss" is a coarsely crystalline metamorphic rock (rocks geologically altered by great heat and pressure, as well as the action of chemical agents) which is usually banded. The bands consist of elongate or platy minerals which alternate with layers of granular minerals.

Based on well and test borings compiled from the Water Resources Bulletin #9 (Hydrogeologic data of the Quinebaug River Basin), depth to bedrock in the vicinity of the Coolidge Property probably ranges from 50 to 60' below the surface of the ground. It appears that the only effect underlying bedrock will have on future development of this site is related to water quality and the yield of any potential well (s).

The bedrock geologic map of the Plainfield quadrangle was mapped by H. Roberta Dixon and published by The U.S.G.S. (Map GQ-481, 1965).

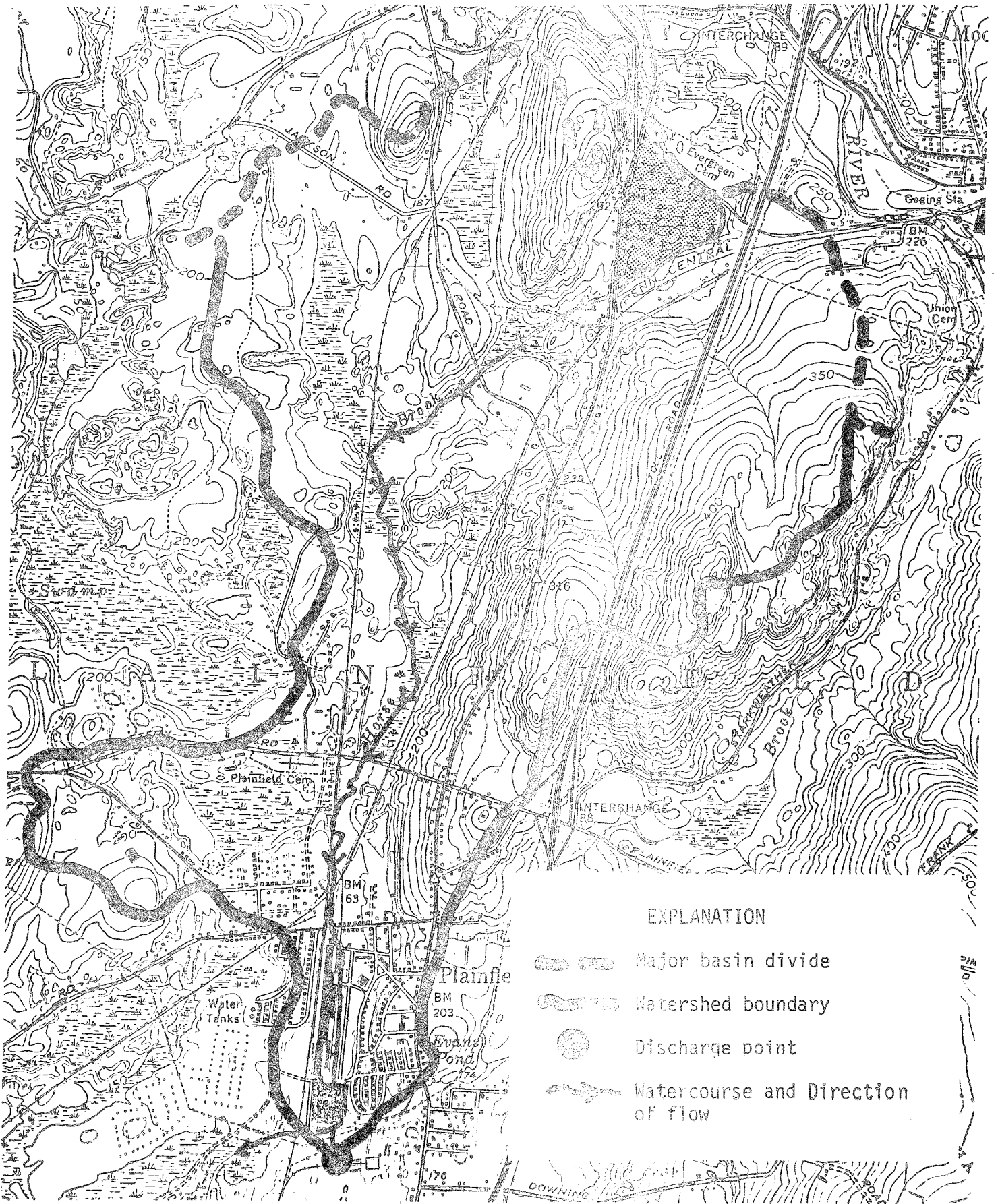
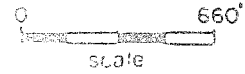
Surficial geologic material or materials that overlie bedrock and which dominate most of the Coolidge Property consist of swamp deposits (See Surficial Geologic Map). Swamp deposits include muck and peat as well as small amounts of sand and silt. There is a strip along the Route 12 side of the property which has been filled in for building purposes. Fill material, based on visual observation, consists primarily of a mixture of sandy till and gravel. Soils surrounding the parcel are mapped as sand and gravel deposits.

The surficial geologic map of the Plainfield topographic quadrangle was mapped by Byron D. Stone and Allan D. Randall (GQ-14422, 1978) and published by the U.S. Geological Survey.





HYDROLOGY

The Coolidge Property lies within the upper reaches of the Horse Brook Watershed (See Watershed/Drainage Map). An unnamed stream, which drains the property, flows in a southeast direction from the southern portion of the site. It then flows into a wetland area from which Horse Brook originates. Runoff from this watershed ultimately flows into the Quinebaug River.

Drainage Areas



EXPLANATION

-  Major basin divide
-  Watershed boundary
-  Discharge point
-  Watercourse and Direction of flow

The property, with the exception of the outer fringes, is composed of a wetland which serves as a natural retention area for runoff from developed parts of property as well as surrounding properties. Development of the property can be expected to increase the amount of runoff from the site. Runoff increases would arise from the creation of impermeable surfaces such as roofs, driveways, etc. The added runoff from developed areas could cause a decrease in the retention capabilities of the wetland. This could lead to an increase in the peak flood flows of the unnamed stream at the outlet of the wetland and ultimately to areas downstream. Therefore, it is recommended that these problems be addressed by having the prospective developer prepare a plan which shows how stormwater will be handled and the effects of development on flood prone areas downstream. Also, the prospective developer should formulate and follow an erosion and sediment control plan which will be most important during the construction phase.

As indicated in the Waste Disposal section of the report, it is recommended that any development on the site be served by public sewers. This should effectively eliminate any potential risk of substantial ground water contamination, especially since the property would probably be served by on-site wells. Also, it is recommended that the prospective developer first contact all appropriate town officials as well as the Inland Wetland Commission regarding applicable state statutes ordinances and/or regulations which pertain to the property.

SOILS

A detailed soils map of this site is included in the Appendix to this report accompanied by a chart which indicates soil limitations for various urban uses. As the soil map is an enlargement from the original 1,320 feet/inch scale to 660 feet/inch, the soil boundary lines should not be viewed as absolute boundaries, but as guidelines to the distribution of soil types on the site. The soil limitation chart indicates the probable limitations for each of the soils for on-site sewerage, buildings with basements, buildings without basements, streets and parking, and landscaping. However, limitations, even though severe, do not preclude the use of the land for development. If economics permit large expenditures for land development and the intended objective is consistent with the objectives of local and regional development, many soils and sites with difficult problems can be used. The soils map, with the publication Soil Survey, Windham County, Connecticut, can aid in the identification and interpretation of soils and their uses on this site. Know Your Land: Natural Soil Groups for Connecticut can also give insight to the development potentials of the soils and their relationship to the surficial geology of the site.

The soil series most typical of this site is Carlisle organic muck. This soil is nearly level and very poorly drained. It is in low depressions on outwash terraces and glacial till plains. Slopes range from 0 to 2 percent but are mostly less than 1 percent.

Typically, this soil is black, very dark brown, and dark reddish brown muck to a depth of 60 inches or more.

Included with this soil in mapping are small areas of very poorly drained Adrian, Palms, Saco, Scarboro, and Whitman soils. A few small areas have a thin mineral layer on the surface. Included areas make up about 25 percent of the unit.

The water table of this Carlisle soil is at or near the surface during most of the year. The available water capacity is high. Permeability is moderately rapid. Runoff is very slow, and water is on the surface of some areas from autumn to spring and after heavy rains. The soil is very strongly acid to slightly acid.

The high water table makes this soil generally unsuitable for cultivated crops. Most areas do not have adequate drainage outlets. Although most areas support red maple, ash, and alder, the soil is poorly suited to woodland production. The organic material will not support heavy equipment, and uprooting is common during windy periods.

The high water table and the low strength of the organic material make this soil generally unsuitable for community development.

VEGETATION

The property may be divided into two major vegetation types. These include a cedar swamp of 31± acres and a mixed hardwood stand of 4± acres. An additional 5± acres has been developed for commercial uses.

Vegetation Descriptions

Type A (Cedar Swamp) Poor to medium quality pole-size Atlantic white cedar, white pine, red maple and American elm are present in this 31± acre fully stocked stand. Spicebush, sweet pepperbush and swamp azalea form the understory. Ground cover consists of mosses, sedges and ferns.

Type B (Mixed Hardwood) This 4± acre fully stocked stand is made up of medium quality pole to sawtimber-sized black oak, scarlet oak, white oak, black birch and red maple. An understory of hardwood seedlings and huckleberry exists. Mosses, grasses and ferns form the ground cover.

Management Potential

The Atlantic white-cedar, found in Vegetation Type A, grows in a narrow coastal belt 50-130 miles wide from southern Maine to northern Florida and westward to southern Mississippi. The distribution of the species within the coastal belt is exceedingly patchy, since suitable sites are scarce.






Of Connecticut's 1,805,600 forested acres, only 14,900 acres or 0.8% is the white-cedar forest type. The 31 acres on this parcel while representing 0.2% of the total white-cedar acreage is nonetheless important. Thought should be given to conservation, but not preservation, of this parcel.

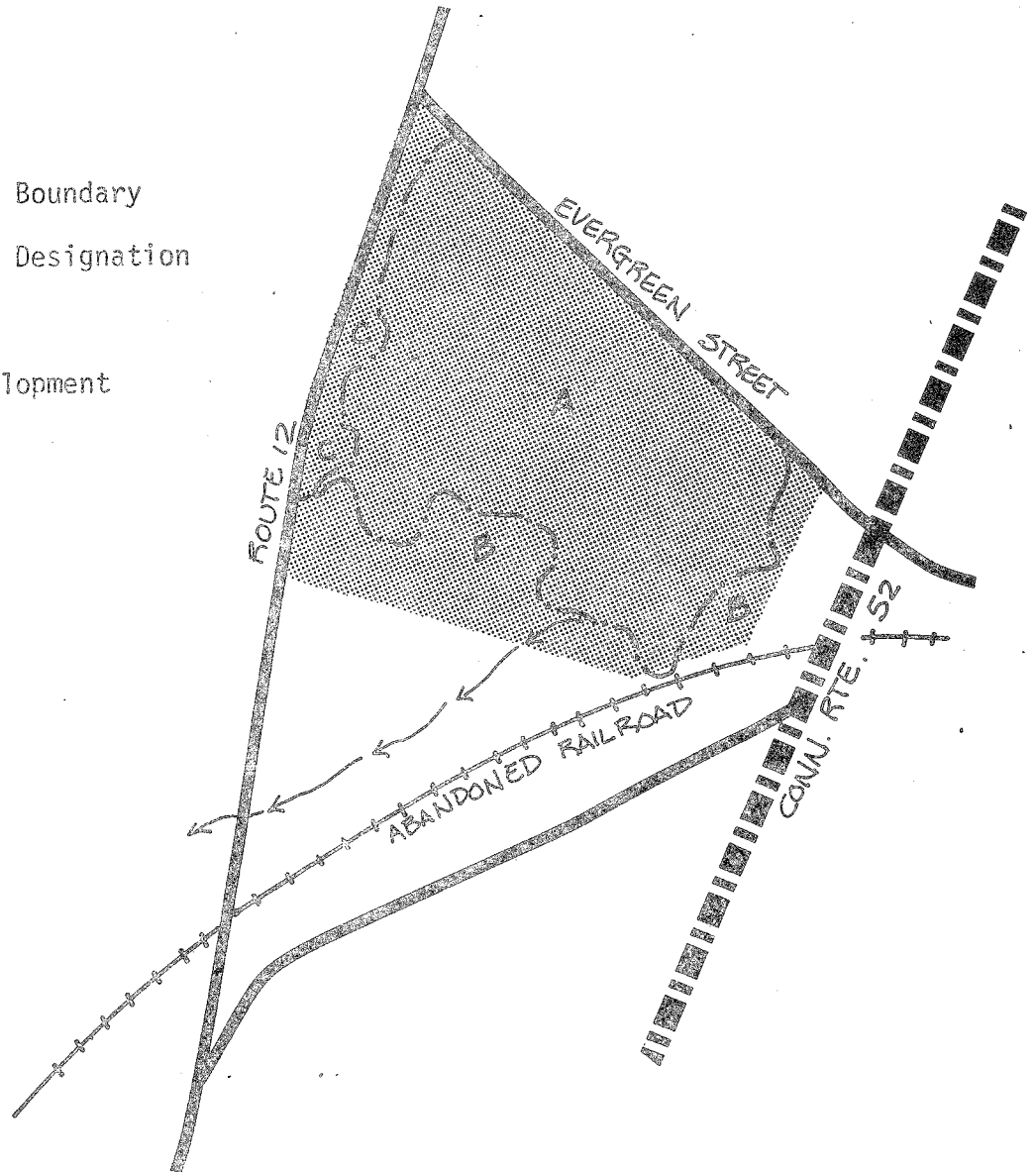
The loss of trees to windthrow in the cedar swamp represents a potential hazard. The saturated soils present result in the development of shallow root systems which are unable to securely anchor the trees. The stocking level of this stand may aggravate this hazard because the trees rely on each other for stability. Heavy thinnings and clearing in or alongside this area may increase the windthrow potential by allowing wind to pass through rather than over this area. Disturbances in or near the cedar swamp should be kept to a minimum to avoid increasing the windthrow potential.

Vegetation



LEGEND

-  Site
-  Vegetation Type Boundary
-  Vegetation Type Designation
-  Stream
-  Commercial Development



VEGETATION TYPE DESCRIPTIONS*

TYPE A: Cedar Swamp, 31= acres, fully stocked, pole size.

TYPE B: Mixed Hardwood, 4- acres, fully stocked, pole to sawtimber size.

- * Seedling Size: Trees less than 1" diameter at 4.5' above the ground (DBH).
- Sapling Size: Trees 1 to 5" DBH.
- Pole Size: Trees 5 to 11" DBH.
- Sawtimber Size: Trees 11" DBH and larger.

A change in the water level of the swamp, either by draining or filling, will negatively impact the vegetation present. A lowering of the level will cause mortality of both the pole-sized cedars and the cedar reproduction, thus converting the area to hardwoods. Inundation of the area would kill all vegetation, forming an open swamp.

Vegetation Type A should not be thinned, as thinnings encourage the development of severe hardwood tree and shrub competition in the understory. This hardwood understory will prevent desirable Atlantic white-cedar reproduction from becoming established.

This coastal swamp type requires even-aged management, with clearcutting in blocks or strips 100 to 150 feet wide. Adjoining strips may then be harvested after reproduction is established.

Vegetation Type B could be lightly thinned to allow the best trees to continue growth with improved health and vigor. Only culls and diseased or misshapen trees should be removed. Favor the best trees of all species for a future sawtimber crop.

WATER SUPPLY

At the present time, the Coolidge Property would have to be served by private on-site wells as public water is not available to the site.

The most likely source of supply for the property would be on-site bedrock wells. Bedrock wells are commonly capable of providing small but reliable yields. Bedrock transmits water mostly by means of its fracture system. Therefore, the yield of the well will depend upon how many fractures it intersects and how much water each fracture is capable of transmitting. It is indicated in Water Resource Bulletin #8 (Quinebaug River Basin), that drilled wells tapping bedrock in this area are commonly capable of providing small but adequate household water supplies. It is estimated that at least 85% of the drilled wells penetrating 100' of bedrock could supply 3 gpm. It should be noted that the team geologist reviewed well completion and water quality reports of two drilled wells recently installed within the review site. The wells reported high yields (50 and 60 gallons per minute at depth of approximately 80') however, water quality reports indicated elevated levels of iron, color and turbidity. Untreated water supplies having elevated iron levels may stain laundry and plumbing fixtures reddish brown, clog filters and impart a metallic taste. Turbidity and color in drilled wells may be caused by elevated iron level, improper development of a well or failure to cement the annular space. "Annular space" is the space between the 6" casing and drill hole. Iron, turbidity and color can be controlled by the proper installation of appropriate filtration devices. If the prospective developer is concerned about possible problems with water quality or quantity, it is recommended that he survey owners of existing bedrock wells in the area.

If individual on-site wells are installed on the property, they must be properly located to afford maximum protection from possible contaminants, i.e., sewage, road salt, etc. They should be located at a relatively high point on the site and in compliance with all sections of Sec. 19-13-B51 a-m, inclusive, of the Public Health Code.

WASTE DISPOSAL

Although various sections of Plainfield are serviced by public sewers, the Coolidge Property is presently outside such an area. It was pointed out to the team during the review that there is a sewer line which could be extended from an existing line north of the property. This, however, would be very costly. Therefore, if the sewer line is not extended to the site, the use of on-site sewage systems would be necessary for the development of the property. However, based on observation of site conditions, activities adjacent to the property and Soil Conservation Service maps, it is generally concluded that most of the Coolidge Property would not be suitable or is poorly suited for on-site sewage disposal.

The most limiting factor is the wetland which dominates the parcel. At the time of this review, no on-site testing had been conducted, however, sewage systems should not be constructed in areas where high ground water will interfere with its effective operation.

Based on the present development trends in the area, this site would probably be developed for commercial use. Leaching systems serving commercial buildings would depend upon the porosity of the soil and estimated volume of sewage flow. As a result, some types of commercial buildings, i.e., restaurants, laundromats, etc., would require much larger systems than others. Due to site limitations, on-site sewage systems would require specially designed engineered plans, which are costly. The installation of an on-site sewage system, if permitted, would require complete alteration of the site which further adds to the cost of development. These engineered plans would have to be reviewed for possible approval by both the local and state health department officials.

Prior to future development of the Coolidge Property, a public sewer line should be made available to the site.

PLANNING CONCERNS

The Coolidge Property is centrally located in a growing section of the Town of Plainfield. The site is located in an area where several businesses are located or planned and within a reasonable distance to existing town facilities such as police and fire departments and the town hall. The property is zoned for commercial activity, therefore permitting a number of potential uses. This property would seem ideal, then, for acquisition for additional municipal facilities or commercial development.

Unfortunately, however, there are a number of site constraints and design considerations which would require costly site modifications and lessen the potential value of this property. The property is not served by the sewer line nor does it have a public water supply so would require both on-site septic systems and wells. Design of on-site septic systems and siting of wells on this property would require costly engineered systems and could not be guaranteed against failure without regular maintenance. Soils limitations, wetland soils, excess humus, slope, large stones and ponding impose problems as to the suitability of the lot for development. Overcoming these site limitations could make development of the parcel so costly that it would not be feasible for the town to consider even if the property were donated.

The wetland areas found on a large portion of the lot greatly restrict the development of the site. The Carlisle soil which covers the majority of the site has a number of limitations which would prohibit development or construction without considerable modifications. These limitations have been discussed in detail in the soils section of this report but should be reiterated with regard to planning considerations.

The water table of the soil is at or near the surface during most of the year. Permeability is moderately rapid and runoff is very slow. Most areas do not have adequate drainage outlets. The soil is muck - largely comprised of dark colored, finely divided, well decomposed organic soil material. This organic component is of low strength so that it will not support heavy equipment or structures and thus limits its suitability for community development. Problems of ponding and flooding present additional restrictions on this soil.

Depositing fill at the site without excavating the muck may minimize the problems related to the wetland soil temporarily, but may not provide a permanent solution. As buildings are constructed on the site, their weight may cause the fill material to settle further in the muck and may cause structural problems and damage the buildings. The cost of excavating and filling the area could be prohibitive for virtually any development. Even if the property were donated to the town, the cost of the necessary site modifications may make it economically unfeasible to develop.

Any development that does take place on the site should be done with consideration for the existing drainage within the site. The wetland area and the streams and ponds on the site provide drainage for the site and adjacent areas. Any disturbance of the natural drainage system may have adverse effects on the site and on land around the Coolidge property. An increase in runoff from buildings and paved areas and a decrease in natural flood retention capabilities provided by the wetlands could cause flooding in adjacent areas. The problems resulting from development in this natural drainage system were discussed in detail in the hydrology section of this report but should be emphasized again with regard to planning concerns.

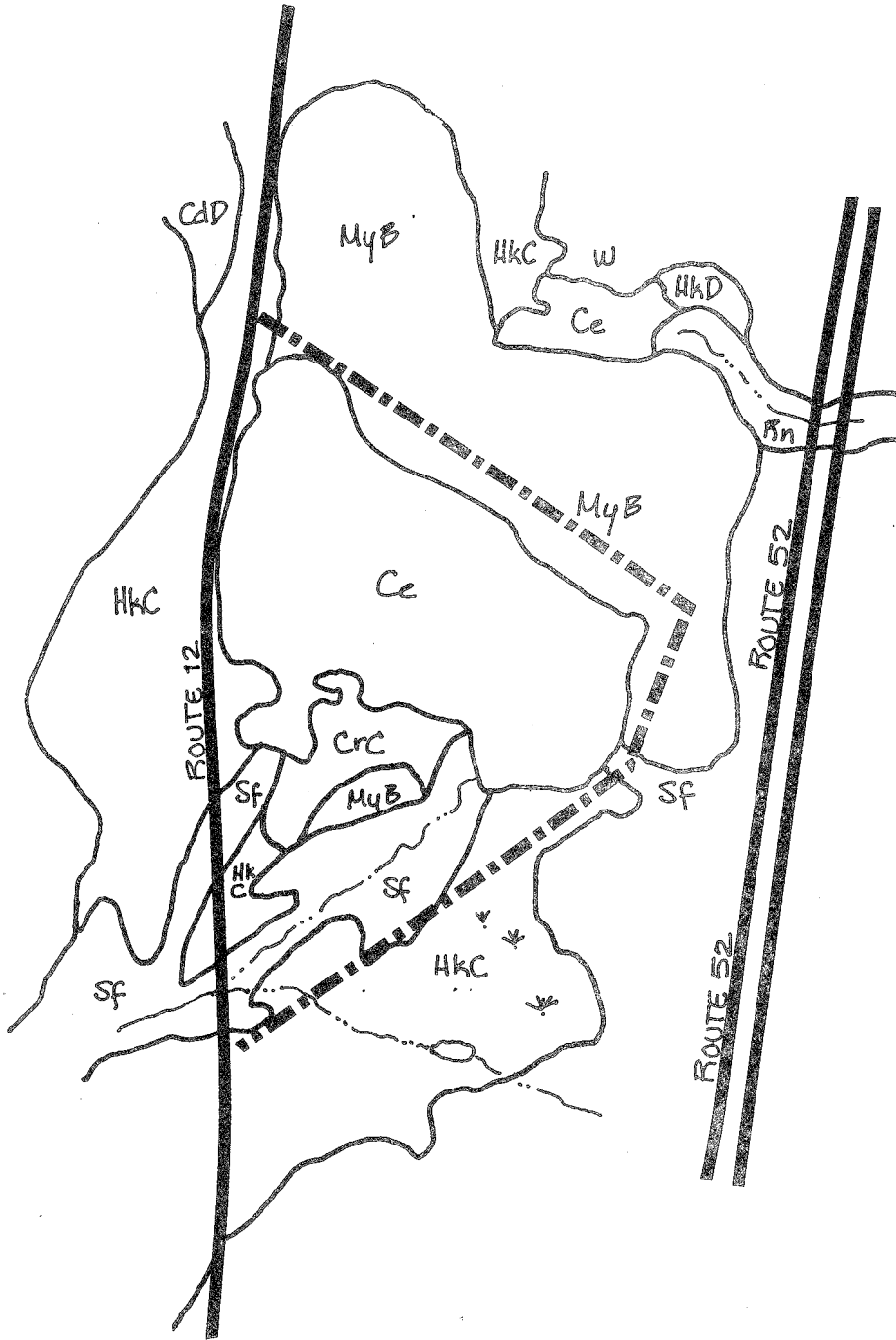
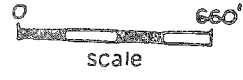
The Coolidge property is an interesting, rather unusual ecological setting which has value in its natural condition. The cedar forest preserved in this wetland area has vegetation and wildlife not commonly found today in this region. Given the limitations of the land for development and the costs of necessary site modifications before building, the town might consider maintaining the site in its present condition and establishing a nature park and/or picnic area on the property. Establishing a nature center on the site would provide an additional municipal recreation area within the town of Plainfield and offer a unique type of open space, conservation and preservation park.

The Plainfield Plan of Development was prepared in 1974 and presented to the Planning and Zoning Commission as a guide for development for the community for the next 20 years. The recommendations outlined in the plan include provisions for Open Space and Recreation. The goal set for this area was, to provide adequate, safe and attractive parks and recreation programs and to increase the amount of land available to the town for that purpose. The specific recommendations presented to attain this goal include 'Preservation of Natural Areas.' A listing of areas that should be protected and preserved as naturally unique areas designated: - the Horse Brook Watershed from Route 12 swamp to entrance of Plainfield

Village and also; - significant wetlands, headwaters, and streambelts. The Coolidge property is included in these specifically cited natural areas which the Plan of Development recommends should be protected and preserved. In accordance with the recommendation of the Plan of Development, the Town should recognize the significance of this sensitive natural area and consider maintaining it in its present state.

Appendix

Soils



COOLIDGE PROPERTY
PLAINFIELD, CONNECTICUT

PROPORTIONAL EXTENT OF SOILS AND THEIR LIMITATIONS FOR CERTAIN LAND USES

Soil Series	Soil Symbol	Principal Limiting Factor	Urban Use Limitations*			
			On-Site Sewage	Buildings w/ Basements	Streets & Parking	Land-Scaping
Carlisle	Ce	Flooding, low strength, ponding	3	3	3	3
Hinckley	HkC	Large stones, poor filter, slope	3	2	2	3
Charlton-Hollis	CrC	slope, depth to bedrock				
Charlton part			2	2	2	2
Hollis part			3	3	3	3
Merrimac	MyB	poor filter	3	1	1	1
Scarboro	Sf	ponding, poor filter, excess humus	3	3	3	3

* Limitations: 1=slight; 2=moderate; 3=severe

SOIL INTERPRETATIONS FOR URBAN USES

The ratings of the soils for elements of community and recreational development uses consist of three degrees of "limitations": slight or no limitations; moderate limitations; and severe limitations. In the interpretive scheme various physical properties are weighed before judging their relative severity of limitations.

The user is cautioned that the suitability ratings, degree of limitations and other interpretations are based on the typical soil in each mapping unit. At any given point the actual conditions may differ from the information presented here because of the inclusion of other soils which were impractical to map separately at the scale of mapping used. On site investigations are suggested where the proposed soil use involves heavy loads, deep excavations, or high cost. Limitations, even though severe, do not always preclude the use of land for development. If economics permit greater expenditures for land development and the intended land use is consistent with the objectives of local or regional development, many soils and sites with difficult problems can be used.

Slight Limitations

Areas rated as slight have relatively few limitations in terms of soil suitability for a particular use. The degree of suitability is such that time or cost would be needed to overcome relatively minor soil limitations.

Moderate Limitations

In areas rated moderate, it is relatively more difficult and more costly to correct the natural limitations of the soil for certain uses than for soils rated as having slight limitations.

Severe Limitations

Areas designated as having severe limitations would require more extensive and more costly measures than soils rated with moderate limitations in order to overcome natural soil limitations. The soil may have more than one limiting characteristic causing it to be rated severe.

About the Team

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

The Team is available as a public service at no cost to Connecticut towns.

PURPOSE OF THE TEAM

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

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

REQUESTING A REVIEW

Environmental reviews may be requested by the chief elected officials of a municipality or the chairman of town commissions such as planning and zoning; conservation, inland wetlands, parks and recreation or economic development. Requests should be directed to the Chairman of your local Soil and Water Conservation District. This request letter should include a summary of the proposed project, a location map of the project site, written permission from the landowner allowing the Team to enter the property for purposes of review, and a statement identifying the specific areas of concern the Team should address. When this request is approved by the local Soil and Water Conservation District and the Eastern Connecticut RC&D Executive Council, the Team will undertake the review on a priority basis.

For additional information regarding the Environmental Review Team, please contact Jeanne Shelburn (774-1253), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Brooklyn, Connecticut 06234.