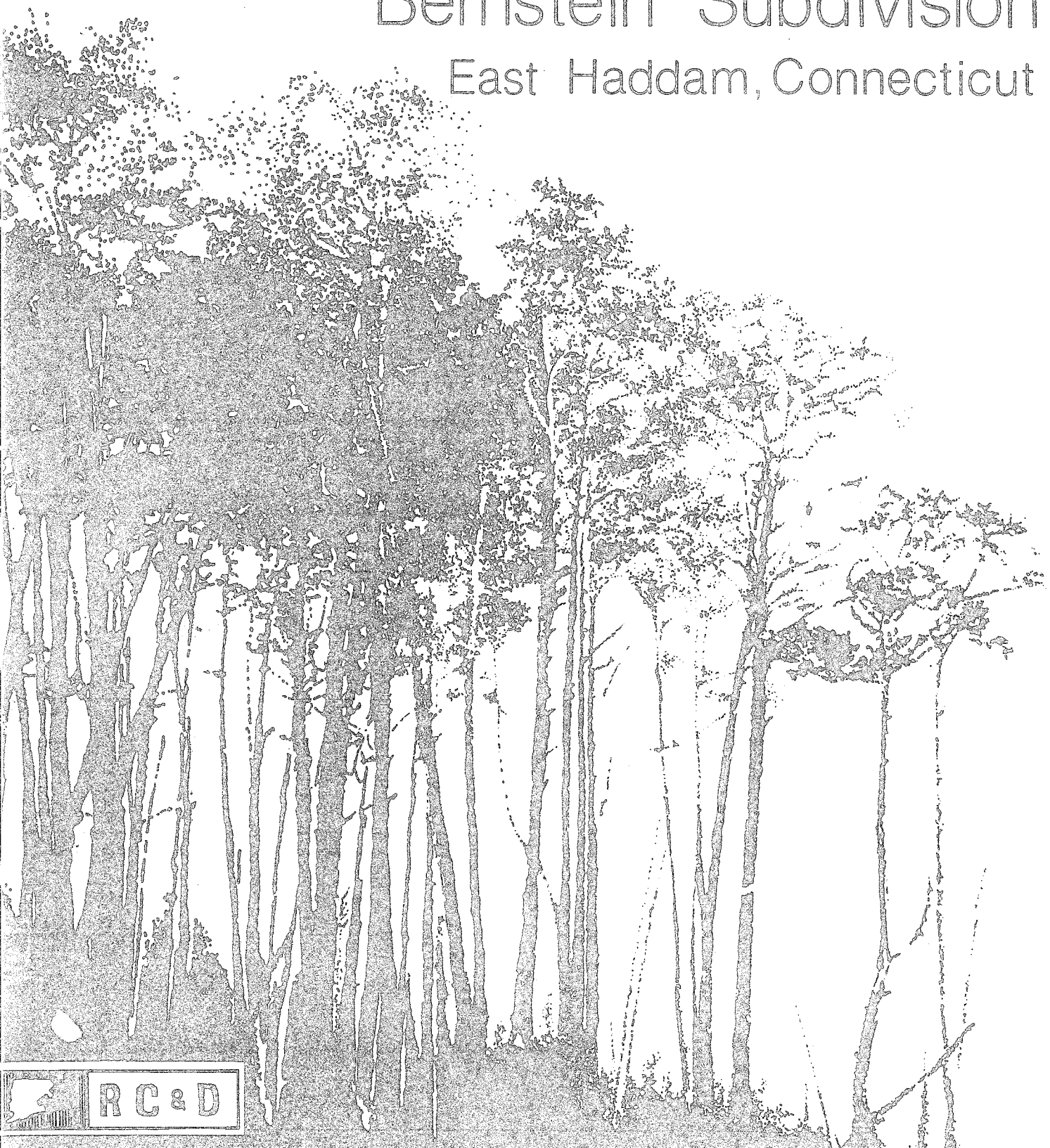
Environmental Review Team Report

Bernstein Subdivision

East Haddam, Connecticut



R C & D

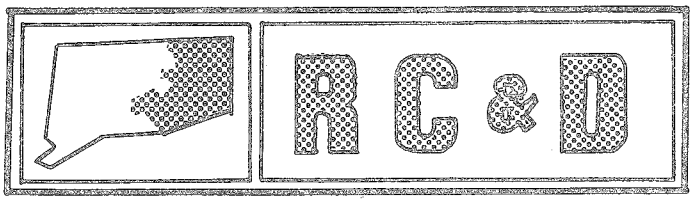
EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Environmental Review Team Report on

Bernstein Subdivision

East Haddam, Connecticut

November 1980

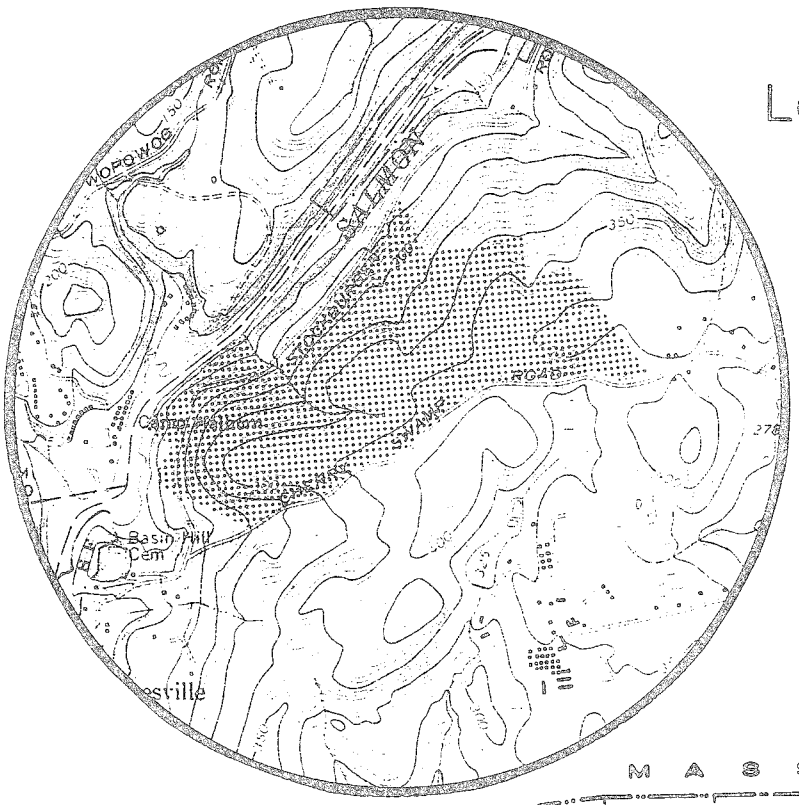


eastern connecticut resource conservation & development area

environmental review team
139 boswell avenue
norwich, connecticut 06360

Location of Study Site

BERNSTEIN SUBDIVISION
EAST HADDAM, CONNECTICUT



ENVIRONMENTAL REVIEW TEAM REPORT
ON
BERNSTEIN SUBDIVISION
EAST HADDAM, CONNECTICUT

This report is an outgrowth of a request from the East Haddam Planning and Zoning Commission, to the Middlesex 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 as a project measure. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The soils of the site were mapped by a soil scientist of the United States Department of Agriculture (USDA), Soil Conservation Service (SCS). Reproductions of the soil survey map as well as a topographic map of the site were distributed to all ERT participants prior to their field review of the site.

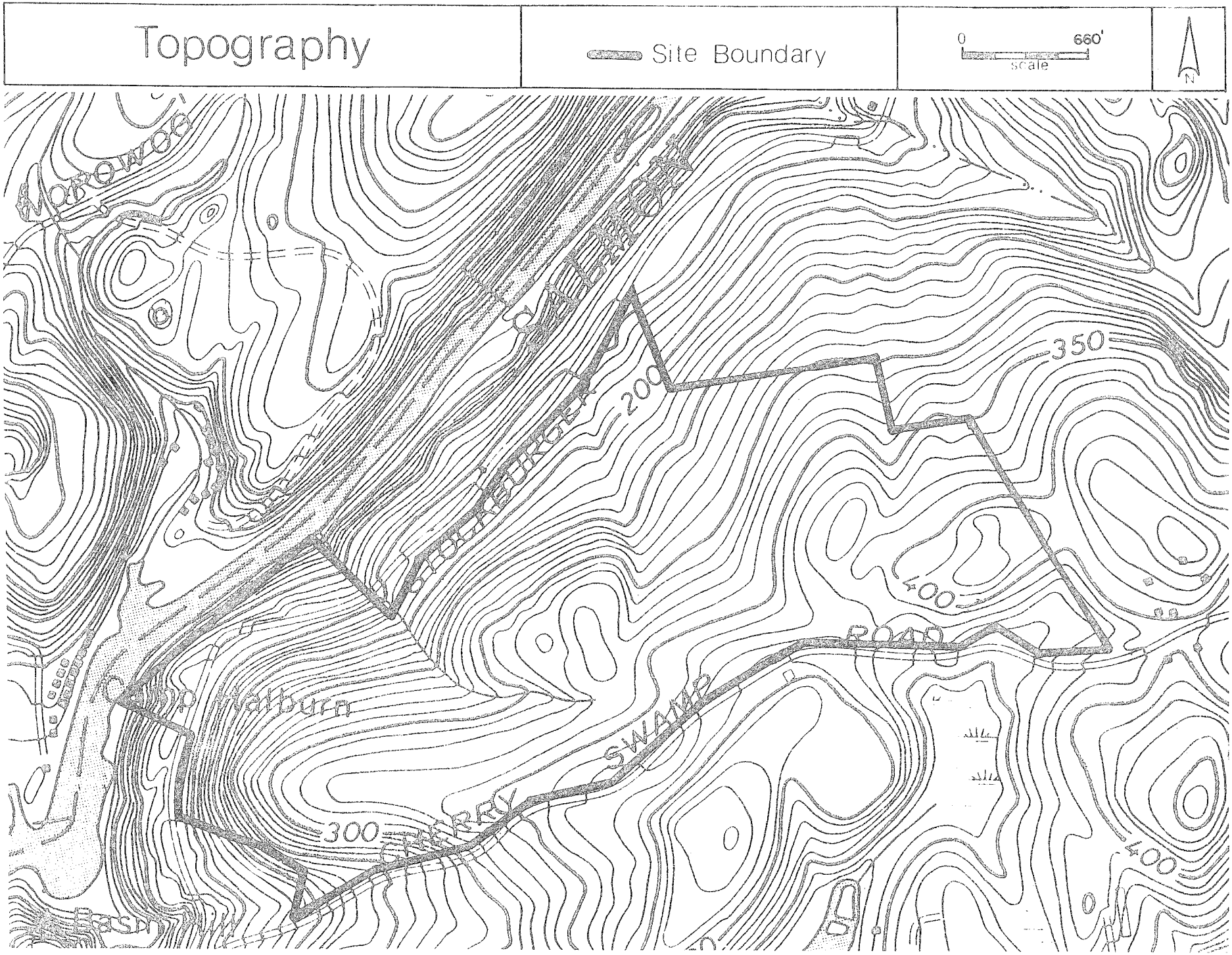
The ERT that field-checked the site consisted of the following personnel: Barry Cavanna, District Conservationist, SCS; Mike Zizka, Geologist, Connecticut Department of Environmental Protection (DEP); Charles Phillips, Fisheries Biologist, DEP; Rob Rocks, Forester, DEP; Tim Dodge, Wildlife Biologist, SCS, Don Capellaro, Sanitarian, State Department of Health; Jim Gibbons, Planner, Cooperative Extension Service; and Jeanne Shelburn, ERT Coordinator, Eastern Connecticut RC&D Area.

The team met and field-checked the site on Thursday, November 6, 1980. Reports from each Team 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 East Haddam. 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 you will find this report of value and assistance in making your decisions on this particular site.

If you require any additional information, please contact: Ms. Jeanne Shelburn, Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, 139 Boswell Avenue, Norwich, Connecticut 06360, 889-2324.


Topography
Site Boundary
0
660'
scale
N
MORROW
CADILLAC
200
350
400
ROAD
SWAMP
300
400

INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to assess the impact of a proposed subdivision in the town of East Haddam. The property to be subdivided is presently in the private ownership of Myron Bernstein. Engineering plans for the proposal have been prepared by Angus McDonald and Associates, Inc. A traffic study for potential increases in use of area roads was conducted by Hesketh and Associates, a traffic planning and engineering firm.

The property is approximately 220+- acres in size and is located north of Cherry Swamp Road and south of Stockburger Road. A small section of the parcel, approximately 10 acres in size, extends north of Stockburger Road to the Salmon River. The proposed plans show 33 lots, ranging in size from 2.3+- acres to 12.9 acres. Each lot would be served by on-site wells and on-site septic disposal systems. Road access is provided by frontage on Cherry Swamp Road and Stockburger Road. Five of the proposed lots are rear lots with extended accessways into the property.

Cherry Swamp Road and Stockburger Road are presently unimproved town roads of moderate width (approximately 12 feet). The developer has negotiated with the town and has agreed to widen both roads to 18 feet. These roads are to remain unpaved. Fill for improvement of these roads will be excavated from lot 31, located north of Stockburger Road. Detailed grading plans for this excavation have been submitted to the Planning and Zoning Commission with the proposed subdivision plans.

The site is located within the watershed of the Salmon River, one of the rivers selected for re-introduction of anadromous fish by the State Fisheries Unit. Water quality in the river at this time is exceptional. A new fish ladder has been installed with the reconstruction of the Leesville Dam downstream from the site. The topography of the site is extremely rugged in some sections, lots 31, 32, and 33 having the steepest slopes. Those on the south side of Stockburger Road also have steep slopes, but are extremely rocky. Large boulders and bedrock outcrops were prevalent. The property is completely forested at present. Large stands of mature hemlocks are located near Stockburger Road. Soils on the site range from poorly drained to excessively permeable.

The Team is concerned with the effect of the proposed development on the natural resource base of the site. Although severe natural limitations can often be overcome with proper engineering measures, these techniques can become costly, making a project financially unfeasible for a developer. In the case of the proposed subdivision of the Bernstein property, it is the Team's understanding that the land will be subdivided and sold to individual lot owners who will in turn establish their own homes on the site. Site plans may be prepared for some of the more "limited" lots, however, it was not clear that the deeds for these lots would be restricted to following these plans.

Severe limitations to development on this site are caused by steep slopes, shallow depth of soil to bedrock and seasonal high water tables. Major Team concerns include adequate sediment and erosion controls for any development on the site, increase in stormwater velocity leaving the site and potential contamination of individual water supplies by on-site septic systems. Soils on this site contribute to the potential for excessive erosion during construction. In order to protect the Salmon River from sedimentation, all possible precautions should be taken to prevent any erosion on this site. The area most susceptible to this problem are the steep slopes in lots 31, 32, and 33. The Commission should consider this area for open space dedication from the

These soils are poorly suited to cultivated crops because of the steep slopes. The soils have a severe erosion hazard, and maintaining permanent plant cover helps to control erosion.

These soils have poor potential for community development. They are limited mainly by steep slopes. Steep slopes of excavations are unstable. Onsite septic systems need very careful and often special design and installation to insure that effluent does not seep to the surface. Lawns, shallow-rooted trees, and shrubs need watering in summer. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction.

Hollis-Charlton extremely stony fine sandy loams, (HpE), consist of moderately steep to very steep, somewhat excessively drained and well drained soils on ridges where the relief is affected by the underlying bedrock on upland glacial till plains. These soils formed in glacial till derived mostly from granite, gneiss, and schist. Areas of this complex are irregular in shape and range from 5 to 250 acres. Slopes are smooth or complex and are mostly 100 to 800 feet long. The areas have a rough surface with bedrock outcrops; narrow, intermittent drainageways; and small, wet depressions. In most areas 3 to 5 percent of the surface is covered with stones and boulders. The total acreage of this complex is about 40 percent Hollis soils, 35 percent Charlton soils, and 25 percent other soils and bedrock outcrops. The soils of this complex are in such an intricate pattern that it was not practical to map them separately.

Included with this complex in mapping are small, intermingled areas of well drained Canton, Montauk, and Paxton soils and moderately well drained Woodbridge soils. Also included are bedrock outcrops, areas of soils with slopes of less than 15 percent, and a few nonstony areas.

The permeability of the Hollis soils is moderate or moderately rapid above the bedrock. Available water capacity is low. Runoff is rapid. Unlimed areas of the Hollis soils are very strongly acid to medium acid.

The permeability of the Charlton soils is moderate or moderately rapid. Unlimed areas of the Charlton soils are very strongly acid to medium acid.

This complex is poorly suited to trees, but is is better suited to woodland than to most other uses. The complex is limited for woodland mainly by the steep slopes, bedrock outcrops, stoniness, and shallow depth to bedrock. Tree windthrow is a concern on the Hollis soils because of the shallow rooting depth above the bedrock. Equipment is difficult to use because of stoniness, steep slopes, and outcrops. Logging roads and trails need careful layout to prevent erosion.

This complex has poor potential for community development. The soils are limited mainly by the steep slopes, shallowness to bedrock, rock outcrops, and stoniness. Excavation is difficult because of the shallow depth to bedrock in many places. On-site septic systems require very careful and often special design and installation. Many areas of this complex provide a scenic and picturesque setting for homes. The rock outcrops, stones, and boulders have esthetic value and are sometimes left undisturbed. During construction, quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices.

Merrimac sandy loam, (MyB), is a gently sloping, somewhat excessively drained soil on outwash plains and stream terraces of water-sorted sand and gravel derived mainly from granite, gneiss, and schist. Areas are irregular in shape and range from 5 to 75 acres. Slopes are as much as 300 feet long.

Included with this soil in mapping are small, intermingled areas of excessively drained Hinckley and Windsor soils, well drained Agawam soils, and moderately well drained Sudbury soils. Included areas make up 5 to 20 percent of this map unit.

The permeability of this soil is moderately rapid or rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate. Runoff is slow to medium. Unlimed areas are extremely acid to medium acid.

This soil has good potential for community development. Onsite septic systems cause pollution of ground water in places. Steep slopes of excavations are unstable. Lawns, shallow-rooted trees, and shrubs need watering during the summer. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction.

Scarboro mucky loamy fine sand, (SC), is a nearly level, very poorly drained soil in depressions of broad glacial outwash terraces. Areas are dominantly irregular in shape and range from 3 to 90 acres.

Included with this soil in mapping are small, intermingled areas of moderately well drained Sudbury soils, poorly drained Walpole soils, and very poorly drained Adrian soils. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at the surface from fall until late spring. The permeability of the soil is rapid or very rapid. Available water capacity is low. Runoff is slow or very slow. Unlimed areas are very strongly acid to medium acid.

This soil has poor potential for community development because of the high water table. Steep slopes of excavations are unstable. Extensive filling is needed in areas of this soil used for community development. During construction, quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices.

Woodbridge very stony fine sandy loam, (WyB, WxB, WzC), is a gently sloping, moderately well drained soil on side slopes of drumlins and glacial till uplands. Areas are oblong or irregular in shape and range from 3 to 200 acres. Stones and boulders cover 0.1 to 3 percent of the surface. Slopes are mostly concave and are 100 to 400 feet long.

Included with this soil in mapping are small, intermingled areas of well drained Paxton, Montauk, Charlton, and Canton soils and poorly drained Ridgebury and Leicester soils. Also included are a few areas of soils that have a friable and moderately permeable substratum. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 18 inches from autumn until midspring. The permeability is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is medium. Unlimed areas are strongly acid or medium acid.

This soil has fair potential for community development. The soil is limited mainly by wetness and the slowly permeable or very slowly permeable substratum. Steep slopes of excavations slump when saturated. Onsite septic systems need very careful design and installation, and sites require filling in places. Lawns are wet and soggy from late autumn until midspring and for several days after heavy summer rains; artificial drains and land shaping help prevent wet lawns and basements. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction.

Soils on this site are presently stable. A well developed leaf mat or "duff" exists above the soil layer, which helps to slow stormwater runoff and aid in absorption of water into the soil layer. Any development on this site should proceed with extreme caution. Soils on the property generally limit development by their steep slopes, excessive stoniness, seasonal high water table and shallow depth to bedrock. Major concerns relating to these limitations are provision of effective sediment and erosion control measures, protection of the Salmon River and accurate depiction of topographic conditions on final site plans.

Sediment and erosion control plans for this proposal should be developed to the detail required by the East Haddam subdivision regulations. For maximum protection of the Salmon River, those lots proposed for the northern section of Stockburger Road (lots 31, 32, 33) should be eliminated from the development plan. This is the most steeply sloping area of the site and soils in this area are extremely fragile. Any erosion developing on these slopes may be impossible to control or correct once established and sediment would be placed directly in the river. It may be possible for the Commission to request that this area be dedicated to the town for open space under their existing regulations. If this is not possible, an undeveloped buffer strip at least 25 feet wide from the edge of the steep slopes toward Stockburger Road should be required by the Commission. All trees, shrubs and groundcover within this buffer should not be disturbed.

The Commission should also be aware that the proposed development plan calls for a small gravel excavation in lot 31. The site grading plan prepared for this excavation appears to be in conflict with the typical cross section which was provided. A section of the excavation will be taking place on a 40% slope (according to the engineering drawings) which does not appear in the cross section, if it was done at a scale of one inch equals 40 feet as indicated. There also seems to be differing depths of excavation between the section and grading plan. These discrepancies should be corrected before final plans are submitted to the Commission.

Topographic information which has been provided by the developer is questionable in the area of lots 31, 32 and 33. Field inspection of the site reveals a much steeper slope than that indicated on the subdivision plan. During the pre-review meeting the developer's engineer also agreed that photogrammetry is not always accurate in areas of dense evergreen vegetation, similar to those found on site.

Another concern is stormwater management in the area. As explained to the Team, runoff will be carried along the town roads, only along portions owned by the developer and from there it will be the "town's responsibility." Some efforts should be made to insure that all runoff is safely carried to a stable outlet. Consideration should be given to maintaining a safe water velocity to the Salmon River. Stormwater controls should consider not only increased volume but also increased velocity of the flow. Engineering techniques such as dry wells beneath roof gutters should be considered to slow runoff at its source.

VEGETATION

The property proposed for development may be divided into five major vegetation types. These include hemlock (59+- acres), 2 mixed hardwood stands, (91+- acres) old fields, (12+- acres) open meadow, (1+- acre) and hardwood swamp, (1+- acre). Vegetation type descriptions follow.

VEGETATION TYPE DESCRIPTIONS

Type A. - (Hemlock) - This 59+- acre fully to over-stocked stand is made up of pole to sawtimber size Eastern hemlock with black birch, American beech, white ash, white oak and red oak intermixed. Occasional sawtimber-size eastern white pine are also present. Hemlock saplings, American beech saplings and occasional patches of mountain laurel are present in the understory. Little sunlight is able to penetrate to the forest floor and, therefore, heavy groundcover vegetation is not present. There are, however, scattered patches of Christmas fern, Canada Mayflower and club moss.

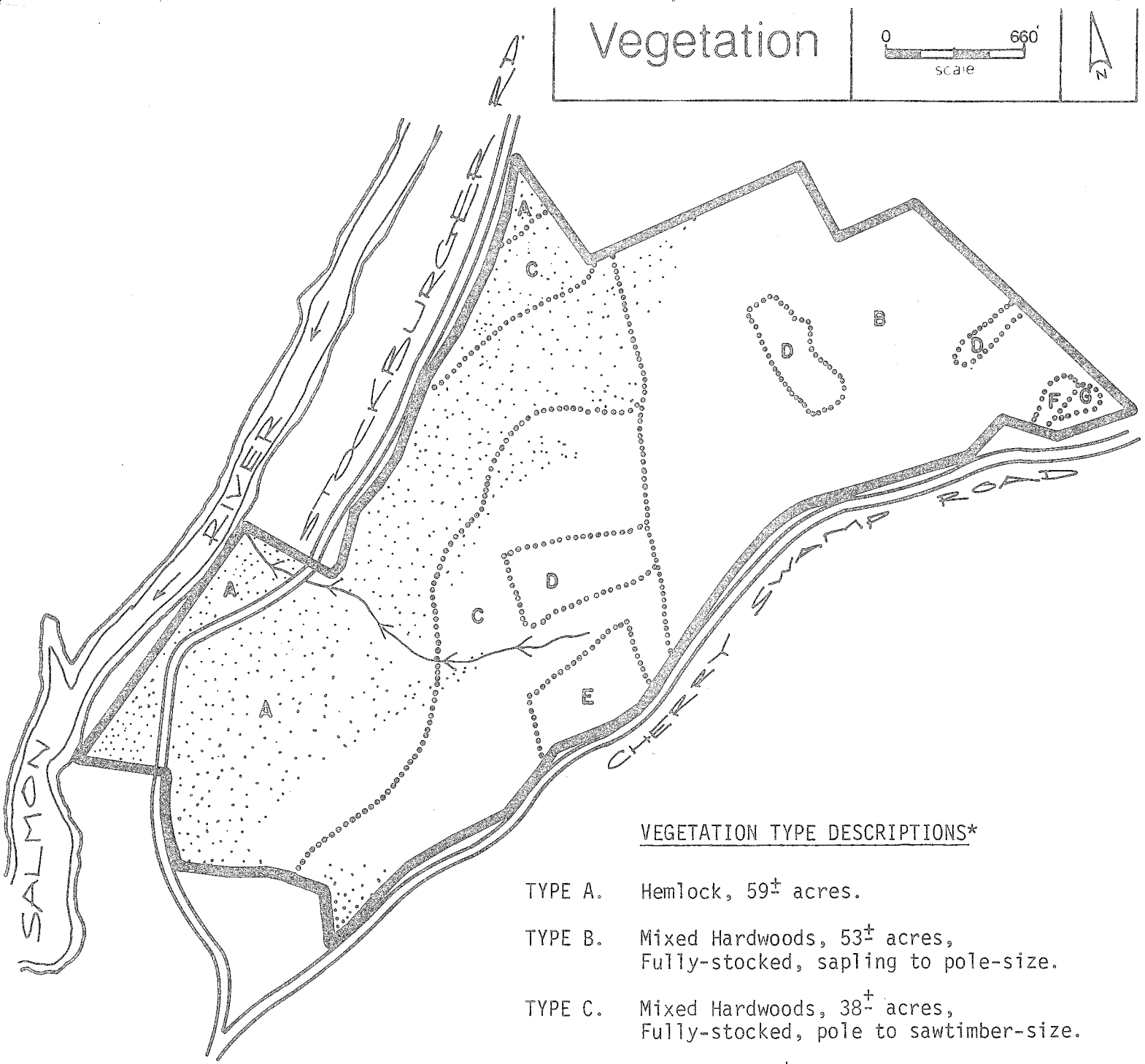
Type B. - (Mixed hardwoods) - Sapling to pole-size black oak, white oak, black birch, shagbark hickory, pignut hickory, red maple, sugar maple and white ash are present in this 53+- acre fully-stocked stand. The trees in this stand are healthy and growing vigorously. Several large sawtimber-size red oak, black oak and white oak with large dead branches are also present in this stand. Understory species found in this stand include hardwood tree seedlings, flowering dogwood, blue beech, maple leaf viburnum and occasional hemlock saplings. Dense patches of spice bush are located in areas where the soils are somewhat poorly drained. Groundcover is dominated by grasses, club moss, Christmas fern, raspberry and huckleberry.

Type C. - (Mixed hardwoods) - Pole to sawtimber-size white oak, black oak and black birch are present along with occasional white ash, sugar maple, red maple and black cherry in this 38+- acre fully-stocked stand. Many of the larger trees are damaged and of poor quality. Hemlock saplings, hardwood tree seedlings, flowering dogwood, blue beech, ironwood and witch-hazel are included in this stand's understory. Ground cover vegetation consists of grasses, club moss, poison ivy, Christmas fern and occasional greenbrier.

Type D. - (Old field) - Three old field areas which total approximately 8 acres are dominated by sapling to pole-size Eastern red cedar. Pole-size white oak and black cherry are scattered throughout these fully-stocked stands along with sapling-size gray birch. Old field juniper, barberry, smooth sumac, poison ivy and club moss are also present.

Type E. - (Old field) - This 4+- acre under-stocked stand is made up of sapling-size Eastern red cedar, gray birch, red maple, black cherry and flowering dogwood. The shrub species which are present include highbush blueberry, maleberry, gray-stemmed dogwood, hawthorn, old field juniper, smooth sumac, staghorn sumac and speckled alder. Groundcover consists of grasses, goldenrod, steeplebush and poison ivy.

Type F. - (Open meadow) - This one acre open meadow is vegetated with grasses and sedges. Red maple seedlings and highbush blueberry are present around the perimeter of this area.



VEGETATION TYPE DESCRIPTIONS*

TYPE A. Hemlock, 59± acres.

TYPE B. Mixed Hardwoods, 53± acres, Fully-stocked, sapling to pole-size.

TYPE C. Mixed Hardwoods, 38± acres, Fully-stocked, pole to sawtimber-size.

TYPE D. Old Field, 8± acres, Fully-stocked, sapling to pole-size.

TYPE E. Old Field, 4± acres, Under-stocked, sapling-size.

TYPE F. Open Meadow, 1± acre.

TYPE G. Hardwood Swamp, 1± acre, Over-stocked, sapling-size.

LEGEND

- Road
- Property Boundary
- Vegetation Type Boundary
- Stream
- Critical Area, Steep Slope

* Seedling-size = Trees less than 1 inch in diameter at 4 1/2 feet above the ground (d.b.h.)
Sapling-size = Trees 1 to 5 inches in d.b.h.
Pole-size = Trees 5 to 11 inches in d.b.h.
Sawtimber-size = Trees 11 inches and greater in d.b.h.

Type G. - (Hardwood Swamp) - Poor quality, sapling-size red maple are present in this over-stocked 1+- acre stand. High bush blueberry, multiflora rose and barberry make up this area's understory. Groundcover is made up of skunk cabbage, tussock sedge and sphagnum moss.

Although no rare or endangered plants were observed during the field investigation, many of the healthy large trees and flowering shrubs which are present throughout this entire tract should be retained. These trees and shrubs have high aesthetic value and may enhance the value of the individual lots by as much as twenty percent.

Care should be taken during the construction period not to disturb the trees that are to be retained. Special care should be taken near hemlock trees, because of their shallow root systems. In general, healthy and high vigor trees should be favored over unhealthy trees because they are usually more resistant to the environmental stresses brought about by construction.

Where feasible, trees should be saved in small groups or "islands." This practice lowers the possibility of soil disturbance and mechanical injury. Individual trees and "islands" of trees should be temporarily, but clearly, marked so they may be avoided during construction.

Trees are very sensitive to the condition of the soil within the entire area under their crowns. Development practices near trees such as excavating, filling and grading for construction of roadways and buildings may disturb the balance between soil aeration, soil moisture level and soil composition. These disturbances may cause a decline in tree health and vigor, potentially resulting in tree mortality within three to five years. Mechanical injury to trees may cause the same results. Dead trees reduce the aesthetic quality of an area and may become hazardous and expensive to remove if near roadways, buildings or utility lines.

It should be noted that a sudden exposure to direct sunlight and the increased soil temperatures caused by clearing may injure or cause mortality of the hemlock trees present in vegetation type A. Once again hemlock, because of their shallow and sensitive root systems are very susceptible not only to windthrow but also to "sunscald" caused by changes in micro-climate brought about by clearing operations.

The flowering shrubs which are present in vegetation types B, C and E including flowering dogwood and mountain laurel, have high aesthetic value and should be retained if possible. The flowering of these shrubs may be stimulated by allowing direct sunlight to reach them. This may be accomplished by complete or partial removal of the overstory trees over these shrubs.

In an effort to minimize potential erosion hazards which have the ability to degrade the water quality of Salmon River through accelerated siltation and sedimentation, any practice which disturbs the leaf litter layer and exposes mineral soil in critical areas should be avoided to the greatest extent possible. Critical areas are areas where soils are highly erosable and slopes are excessively steep. These areas are for the most part located below the 300 foot contour on the U.S.G.S. topographic map. The majority of vegetation type A; (hemlock) is located within this critical area.

In these areas, any removal of vegetation should be restricted to a time when the soils are dry. Complete clearing of the vegetation in this area should be avoided. Partial clearing of trees in the canopy, to stimulate growth of ground-cover vegetation, by allowing sunlight to penetrate to the forest floor, should not exceed one fourth of the total number of trees in the overstory throughout this area within a ten year time period. Only poor quality trees, damaged trees, trees which are a hazard and dead trees should be removed. Healthy, high quality trees should be retained for their aesthetic value and stability. Once again, any practice which has the potential to disturb the soils in these critical areas should be avoided. Those practices which cannot be avoided should be implemented with proper erosion control methods and extreme care. Clearing operations in the critical area has the potential to increase the windthrow hazard. Steep slopes and shallow soils in some places cause trees to be quite unstable because their roots are not securely anchored. Clearing operations will allow wind to flow through this area rather than over it, increasing the windthrow hazard.

The damaged and poor quality trees which are present in vegetation type C (mixed hardwoods) could be removed and utilized as fuelwood. These trees have either severely broken tops, large splits and seams or are extremely poor in form. Their removal will help to avoid potential hazards and allow other vegetation to utilize the space more efficiently. Removal of these trees may be accomplished over the entire stand prior to subdivision, or on an individual lot basis by lot owners.

Scattered throughout vegetation type B (mixed hardwoods) are large sawtimber-size trees, some of which have large dead branches which could become a hazard if buildings were constructed near them. Removal of potentially hazardous dead branches prior to development completion would help to avoid future problems.

A consultant forester or public service forester could be contacted to help the developer determine which trees present a potential hazard and, therefore, should be removed. At the same time, they could point out qualities which make trees worthy of preservation.

WILDLIFE

This 220+- acre parcel is densely wooded. The northern portion of the parcel is steeply sloping and contains a large mature stand of hemlock, mixed with lesser amounts of red oak and white oak. Some red maple, American beech, white ash, birches, and white pine are present. Understory in this area is sparse and primarily composed of tree seedlings, flowering dogwood, spicebush and blueberry. The southern portion of the property has no hemlock, but vegetation is composed of oaks, ash, maple, birch and beech. Understory here is better developed and includes green-briar, multi-flora rose and honeysuckle. Scattered patches of red cedar are also present in this area. Collectively the site provides a fair quality habitat. The major limitation being the lack of understory development.

White-tail deer frequent the area as shown by the browse on plants and number of established trails. The large expanse of undeveloped woodland surrounding the parcel adds to the attractiveness of the site for woodland wildlife species. Seasonal song-birds, squirrel, red squirrel, ruffed grouse, raccoon, skunks and others also frequent the property.

If development occurs on this site, increased disturbance factors from man and pets will have a negative impact on wildlife use of the site. Developers should consider habitat improvement program to be included in their final development plans. This would involve selective tree removal to allow sunlight to reach the understory and landscape plans favoring shrubby growth which produces fleshy fruit. A small wetland area in the northeastern section of the site could also be developed into a pond to encourage wildlife to use this area.

FISH RESOURCES

The proximity of the Salmon River to the proposed development is of prime environmental concern. As a Class AA stream, the Salmon River watershed is a major natural resource in the state of Connecticut.

The watershed is primarily owned by the state and is an important part of the Atlantic Salmon Restoration Program in New England. Consideration is being given toward developing the Salmon River system as a nursery environment for young salmon.

In addition, the Salmon River and its tributaries provide a significant trout fishing experience for tens of thousands of anglers annually.

The proposed development will drain into the river just upstream of the Leesville Dam and fishway. If drainage is not properly controlled, significant siltation of the Leesville impoundment and the fishway itself could occur. Runoff from the proposed development will peak during the spring, as runs of anadromous fish including Atlantic salmon return to the Salmon River.

In order to minimize the impact of the development it is recommended that construction of homes, roads and septic facilities be confined to the less steeply sloped areas, i.e. those areas above the 300 foot contour on the U.S.G.S. topographic map. In conjunction with the installation of efficient sediment pools and basins, these restrictions should reduce negative impacts of the development on the Salmon River.

WATER SUPPLY

Bedrock would be the most practical, and probably the only feasible, aquifer to serve most lots in the proposed subdivision. The sand and gravel deposits along Stockburger Road have only a slight water-supply potential and may be more susceptible to contamination by septic-system effluent, road oil, or other materials.

Water is transmitted through bedrock chiefly by means of fractures. The yield of a bedrock well depends largely on the number and size of water-bearing fractures that the well intersects. Since the distribution of fractures in bedrock is irregular, it is impossible to assess the suitability of any given location for a bedrock well. Statistical analyses of wells in Connecticut have been made, however; these analyses indicate that most (80-90 percent) bedrock wells deliver yields of 3 gallons per minute or more, an amount considered adequate for an average family's household needs. Given the large lot sizes, it is likely that a well with a sufficient yield can be obtained on every lot, although several wells may need to be drilled on some lots to locate a suitable yield.

The initial quality of the groundwater should be good. The Team is concerned with future groundwater quality in the subdivision, however. The Hydrology and Septic Systems sections of this report should be consulted for further discussion of this point. Wells should be placed uphill of septic systems if at all possible. Separating distances between wells and septic systems probably should be maximized on lots 31-33, as the soils on those lots are extremely permeable.

SEWAGE DISPOSAL

As the town of East Haddam does not have a municipal sewerage system, this development will be serviced by on-site subsurface sewage disposal systems. Extensive testing has been undertaken by the engineering firm. According to the project engineer, a considerable number of these pits were made prior to establishing individual lot lines, in order to locate areas where it should be possible to locate houses and their sewage disposal systems.

Based on visual observations of the parcel, consideration of the soil test data and soil mapping data, the parcel in general has a number of limitations for on-site sewage disposal as well as for other components of development.

The most restrictive factors appear to be rock, both outcrops and underlying shallow bedrock and steep slopes. The most pervious and well drained soil lies on the north side of Stockburger Road where three of the proposed lots are located. Sewage disposal for this area should be feasible provided systems are located to the upper and more level area near the road. As the outer portions of the lots slope steeply to the Salmon River, possible house locations would also be limited on the lots. Excavation is planned on lot 31. This excavated material will be used to improve and widen Stockburger Road. Due to the existance of steep slope a relatively short distance north of the road, the concept would not appear to be compatible with sewage disposal and the need to prevent severe erosion problems. As there is an existing drainage discharge into the eastern lot (33), it would be more desirable to have two lots with more road frontage than three.Other lots along Stockburger Road should be generally acceptable although there is rock present along the southern end (lots 21 and 22). With the possible exception of a few of the remaining lots, shallow underlying bedrock is a major concern. A number of test hole results show rock to be present at a depth of less than four feet. It is generally recognized that there should be a minimum of four to five feet of soil depth above ledge for sewage disposal purposes. Lots having less than four feet of existing soil depth would be unsuitable. In areas where bedrock is a major factor and on-site wells are to be utilized, the need for large lots is obvious. Even though large lots are being proposed, many of the upper ones appear to be questionable or possibly only marginally suitable for sewage disposal purposes.

It is noted at the present time, engineered design systems have been prepared for six lots. However, it has been shown (sufficient number of test pits) that the areas needed (primary and reserve) to accommodate the various systems have at least four feet of soil over bedrock and are not encumbered by any rock outcrops within the immediate area, particularly downslope of the prposed system. Lots having less than six feet of soil depth over ledge should also have engineered design.

PLANNING CONCERNS

Section 8-26b of the General Statutes states that whenever a subdivision of land is planned, the area of which will abut or include land in two or more municipalities one or both of which are within a region having a regional planning agency, the planning commission before approving the plan shall submit it to the regional planning agency in which it is located. The regional planning agency shall report within 30 days to each planning commission and the developer its findings on the intermunicipal aspects of the proposed subdivision including street layout, storm drainage, sewer and water service and such other matters as it considers appropriate. As the Bernstein Subdivision abuts the Salmon River which serves as the boundary line between East Hampton and East Haddam, the Midstate Regional Planning Agency, which serves both towns will have an opportunity to report on the intermunicipal aspects of the proposal.

COMPLIANCE WITH LOCAL ZONING REGULATIONS

The proposed subdivision falls in the R or Resort District on the Town's Official Zoning Map. Within the R District any use permitted in other Residence Districts are permitted by right. The minimum lot size required in the R District is 43,560 sq. ft. or 1 acre. All proposed lots meet that requirement as well as other applicable requirements for minimum lot width (150 ft.), minimum front yard (30 ft.), minimum side yard (25 ft.), minimum rear yard (25 ft.), and maximum building coverage (10%).

The proposed subdivision is not within the Connecticut River Gateway Conservation Zone nor is it in the Flood Plain Zone.

The proposed subdivision appears to comply with all sections of the zoning regulations with one possible exception. Section 22.8 of the Zoning Regulations states, in part, "when there are two adjoining interior lot access drives the minimum distance to other interior lot access drives shall be 600 feet."

A review of the "Final Plan" submitted to the Commission indicates that the distance between the access drives serving lots #6 and #10 is 566.51' or 33.49' short of that required by the Zoning Regulations.

COMPLIANCE WITH SUBDIVISION REGULATIONS

Subdivision In Streambelt Area

Section 3.1 of East Haddam's Subdivision Regulations state that any construction, building or structure including septic systems located within the areas designated as streambelts and delineated on a "Streambelt Map" dated April 1973 may be permitted provided the applicant presents evidence and plans to the Commission as required under Section 3.4 of the regulations.

A review of the "Streambelt Map" indicates that lots #31, 32 and 33 fall within the "C" or "Salmon River Streambelt" as does a corridor of approximately 400' in width adjacent to the stream located on lots #29 and 10.

Erosion And Sedimentation Control Plan Required

Section 3.2.1 of the Subdivision Regulations states that a subdivider must submit for Commission approval 3 sets of an Erosion and Sedimentation Control Plan.

Based on the data submitted to the Team there is no evidence that a detailed Erosion and Sedimentation Control Plan had been prepared.

The Commission should encourage the applicant to prepare a Plan and receive a favorable report from the Middlesex Soil and Water Conservation District. Particular emphasis should be placed on the Plan for Lot #31 as gravel removal and regrading is proposed there.

Trees To Be Saved

Section 3.11 of the Subdivision Regulations states that the applicant may be required to indicate the location of trees to be saved. The proposed Plan does not indicate which trees will be saved or cut. The on-site visit allowed the Team to see those trees that will be cut to create an 18' right-of-way; however, there was no indication of trees to be saved on the various lots.

Several trees should be cut to create well managed treed lots; however, certain species should be retained. Of particular concern should be the removal of vegetation on lots #31, 32 and 33 where fragile soils and steep slopes could be disrupted by improper cutting or disregard of recommended woodlot management practices.

Common Open Space Dedication

Section 3.8 of the Subdivision Regulations provides that part of the land to be subdivided for building may be reserved for common open space.

Section 1.1 of the Regulations also state under the Intent of the regulations "that provision may be made for open spaces within land to be developed..."

Under Section 2.0 "Common Open Space" is defined as a parcel or parcels of land or an area of water intended for the use of enjoyment of residents of the subdivision and/or of the general public. Scenic open or wooded areas is an example of the type of open space considered acceptable parcels designated as Common Open Space.

The Commission might consider using the open space dedication provision to protect the environmentally significant area of 8.9 acres located adjacent to the Salmon River and designated on the Subdivision Plan as lots #31, 32 and 33. There are several reasons why this area should be preserved including:

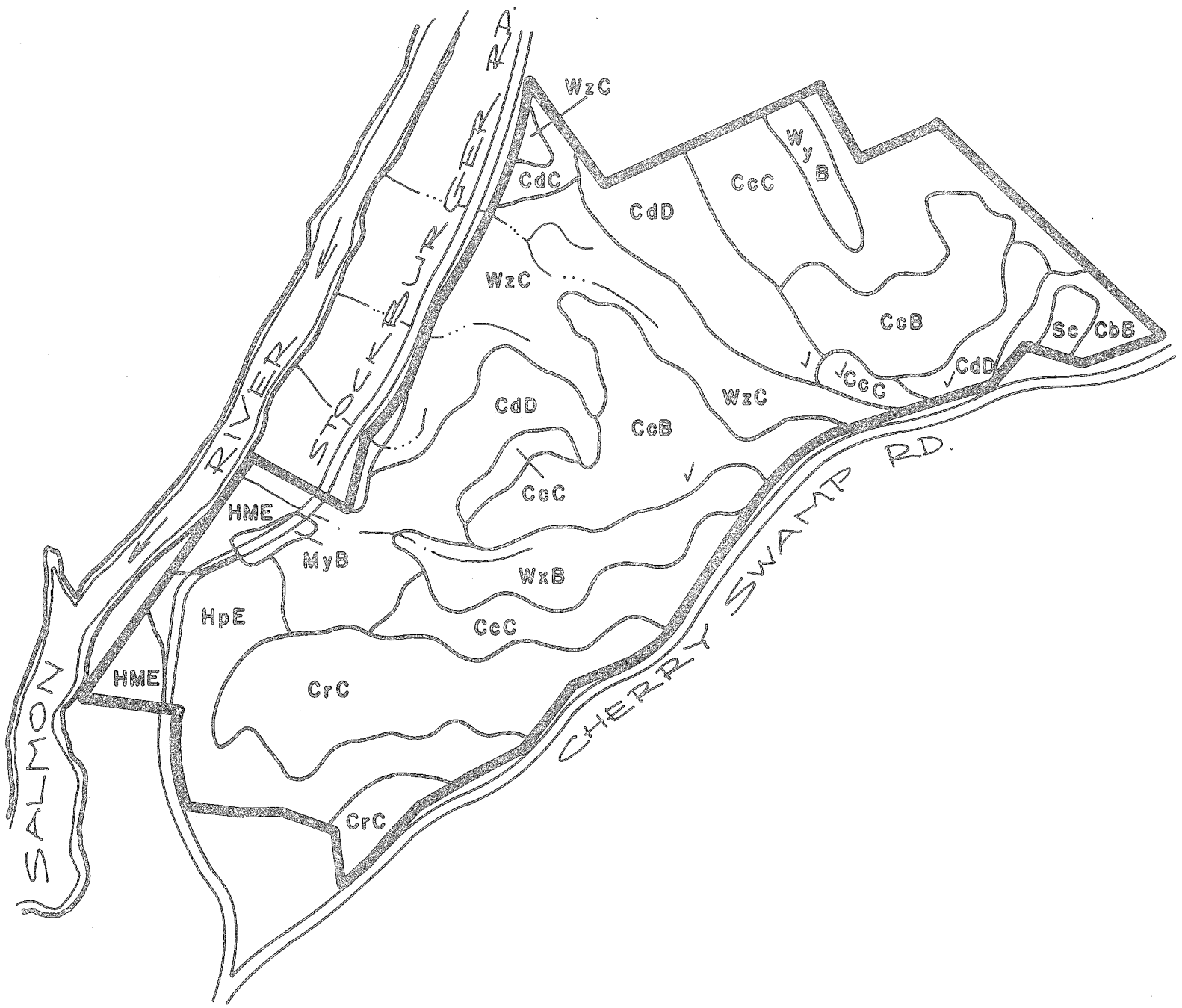
a. Section 1.1 of the Subdivision Regulations states in part that land in soils associated with brooks and rivers be protected from the adverse affects of development.

b. On the "Streambelt Map" for East Haddam dated April 1973 and its associated East Haddam Streambelt Report prepared by the Soil Conservation Service, Stockburger Road is delineated as "a scenic gravel road paralleling the Salmon River" and the land included in proposed lots #31, 32 and 33 is delineated as part of the Salmon River Streambelt. The Report states on page 7 "In East Haddam the pattern of streambelts presents an excellent opportunity to preserve open space corridors near all residential areas."

c. Preserving the open character of land adjacent to the Salmon River will help insure the present high water quality found there. The Salmon River is one of the state's cleanest rivers presently enjoying a "Class A" rating meaning it is suitable for water supply and all other water uses. Also the state has recently completed construction of a fish ladder in order to facilitate the return of the salmon to the river. This facility is downstream and adjacent to the proposed subdivision.

d. Preservation of the 8.9 acres would promote the health, safety and welfare of property owners adjacent to the Salmon River as well as all people in the area because a significant environmentally fragile corridor offering plant and wildlife habitat, natural beauty and a buffer between proposed development and one of the state's cleanest rivers would be saved.

Appendix



Soils	0 660' SCALE	N

BERNSTEIN PROPERTY
EAST HADDAM, CONNECTICUT
PROPORTIONAL EXTENT OF SOILS AND THEIR LIMITATIONS FOR CERTAIN LAND USES

Soil Series	Soil Symbol	Approx. Acres	Percent of Acres	Principal Limiting Factor	Urban Use Limitations*			
					On-Site Sewage	Buildings with Basements	Streets & Parking	Land-Scaping
AGAWAM	AFA	4	2		1	1	1	1
CANTON-CHARLTON	CbB	7	3.5		1	1	1	1
CANTON-CHARLTON	CcB	32	16	large stones	2	2	1	2
CANTON-CHARLTON	CcC	35	18	slope, large stones	3	3	2	3
CANTON-CHARLTON	CdC	34	17	slope, large stones	3	3	3	3
CHARLTON-HOLLIS	CrC	21	11	slope, large stones, depth to rock				
CHARLTON PART					2	2	2	2
HOLLIS PART					3	2	2	2
HINCKLEY-MANCHESTER	HME	4	2	slope, depth to bedrock	3	3	3	3
HOLLIS-CHARLTON	HpE	19	10	slope, depth to rock, lg. stones	3	3	3	3
MERRIMAC	MyB	2	1		1	1	1	1
SCARBORO	Sc	1	.5	wetness	3	3	3	3
WOODBRIDGE	WyB	2	1	wetness, frost action, stones	3	3	3	3
WOODBRIDGE	WxB	8	4	wetness, stones frost action, percs slowly	3	3	3	1
WOODBRIDGE	WzC	27	14	large stones, wetness, frost action	3	3	3	3

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 a minimum of 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 (889-2324), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, 139 Boswell Avenue, Norwich, Connecticut 06360.