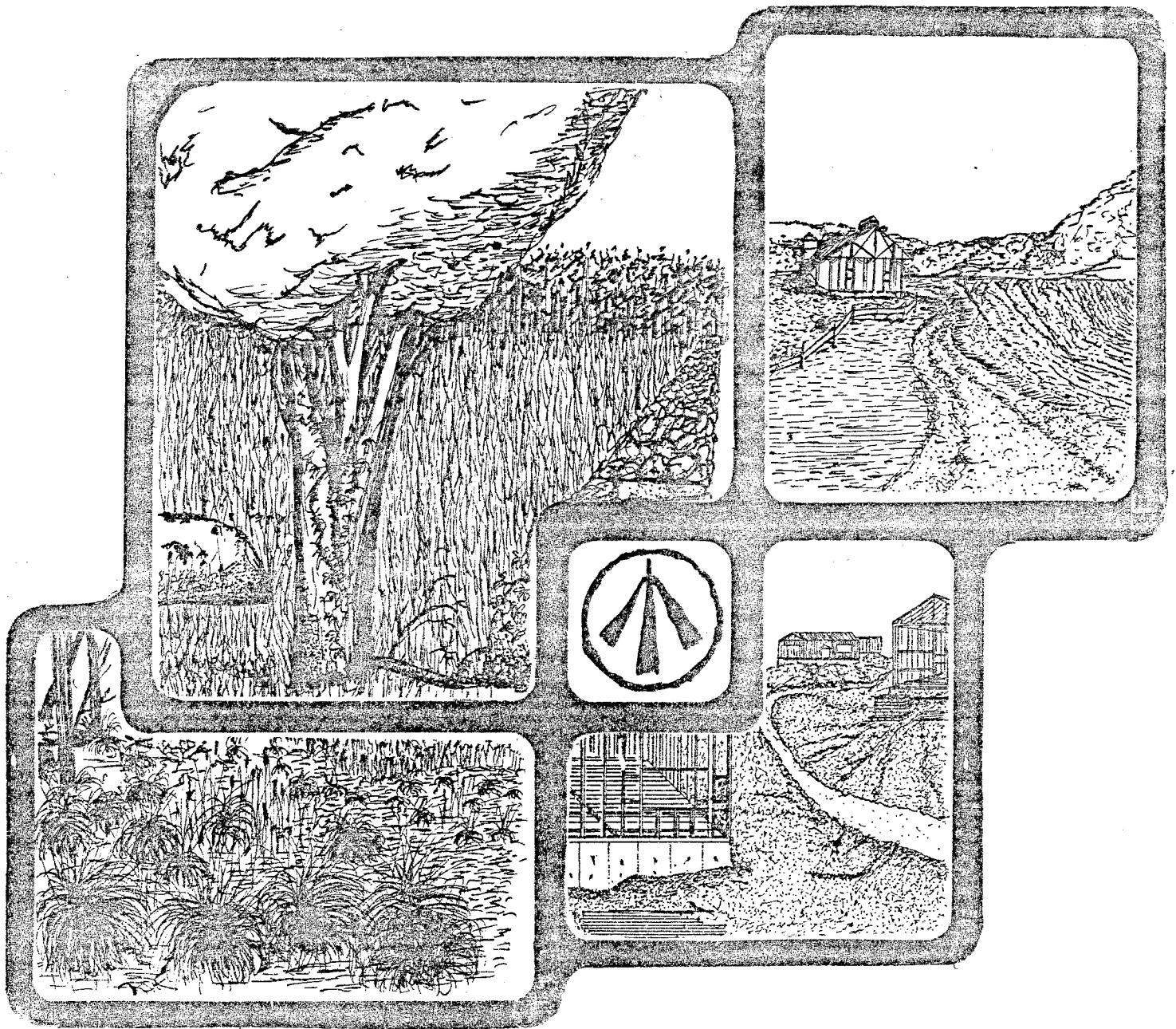


# ENVIRONMENTAL REVIEW TEAM REPORT

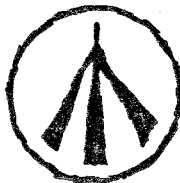


## MEADOWBROOK FARMS ORANGE, CT

KING'S MARK  
RESOURCE CONSERVATION & DEVELOPMENT AREA

**KING'S MARK  
ENVIRONMENTAL REVIEW TEAM REPORT**

**MEADOWBROOK FARMS  
ORANGE, CT  
FEBRUARY 1985**



King's Mark Resource Conservation and Development Area  
Environmental Review Team  
Sackett Hill Road  
Warren, Connecticut 06754

## ACKNOWLEDGMENTS

The King's Mark Environmental Review Team operates through the cooperative effort of a number of agencies and organizations including:

### Federal Agencies

U.S.D.A. Soil Conservation Service

### State Agencies

Department of Environmental Protection  
Department of Health  
University of Connecticut Cooperative Extension Service  
Department of Transportation

### Local Groups and Agencies

Litchfield County Soil and Water Conservation District  
New Haven County Soil and Water Conservation District  
Hartford County Soil and Water Conservation District  
Fairfield County Soil and Water Conservation District  
Northwestern Connecticut Regional Planning Agency  
Valley Regional Planning Agency  
Central Naugatuck Valley Regional Planning Agency  
Housatonic Valley Council of Elected Officials  
Southwestern Regional Planning Agency  
Greater Bridgeport Regional Planning Agency  
Regional Planning Agency of South Central Connecticut  
Central Connecticut Regional Planning Agency  
American Indian Archaeological Institute  
Housatonic Valley Association

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FUNDING PROVIDED BY  
State of Connecticut

POLICY DETERMINED BY  
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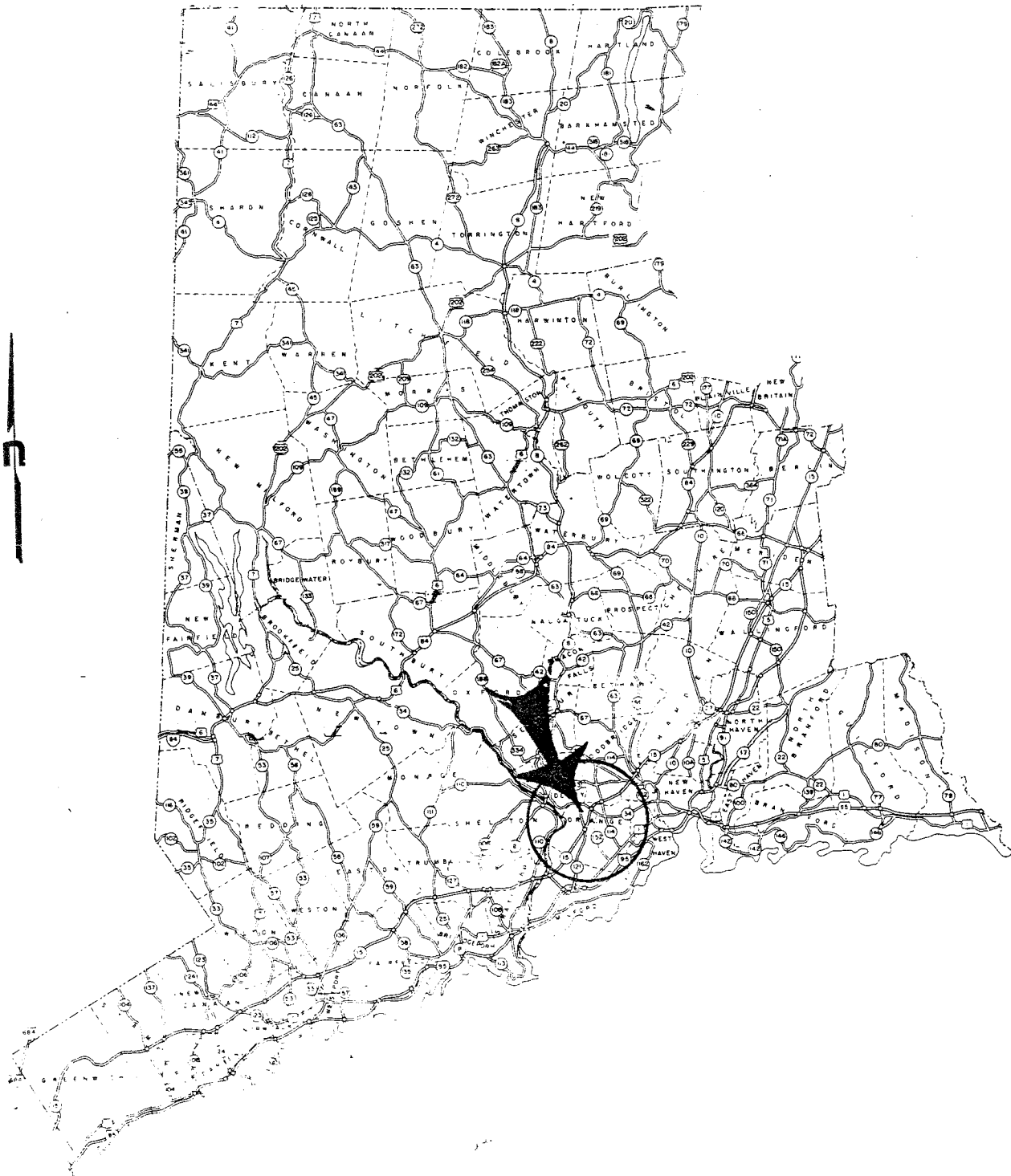
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# LOCATION OF STUDY SITE



Scale 1" = 10 miles



# MEADOWBROOK FARMS

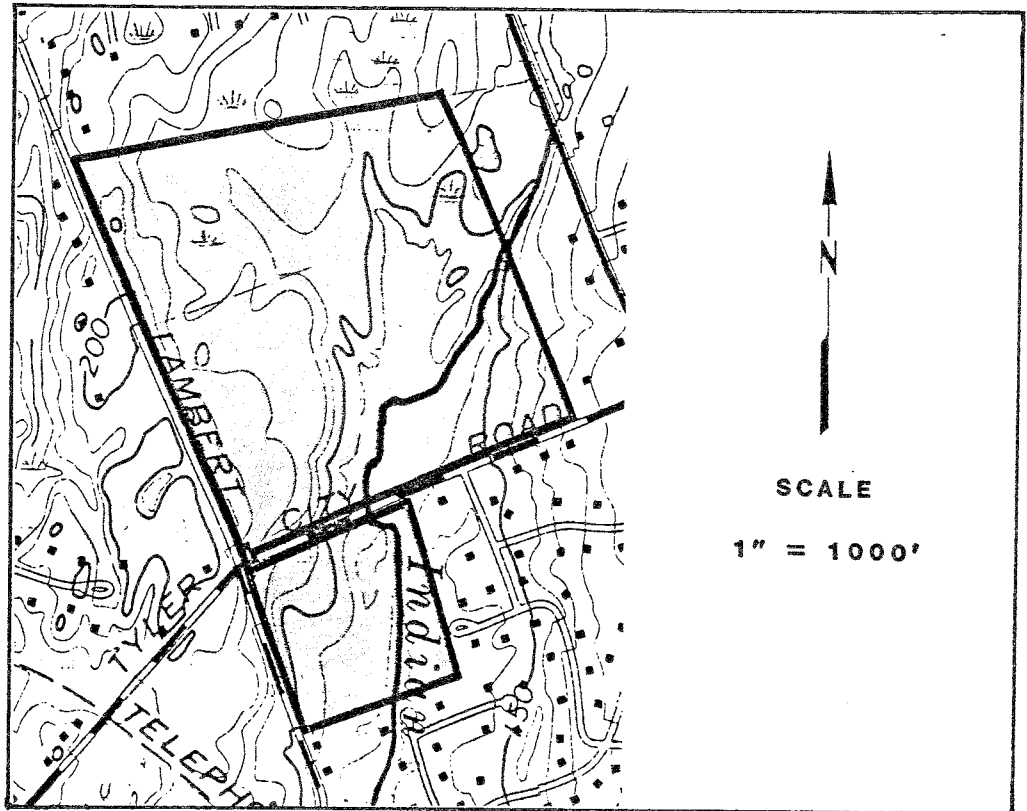
## I. Introduction

The preparation of this report on "Meadowbrook Farms" was requested by the Orange Conservation Commission.

Meadowbrook Farms is a +102 acre tract of land located near the center of town off Lambert Road and Tyler City Road. The site consists primarily of open farm land, which slopes gently or moderately towards Indian River (see Figure 1). Indian River flows southward through the eastern limits of the property.

Figure 1

### Topography

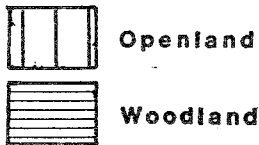
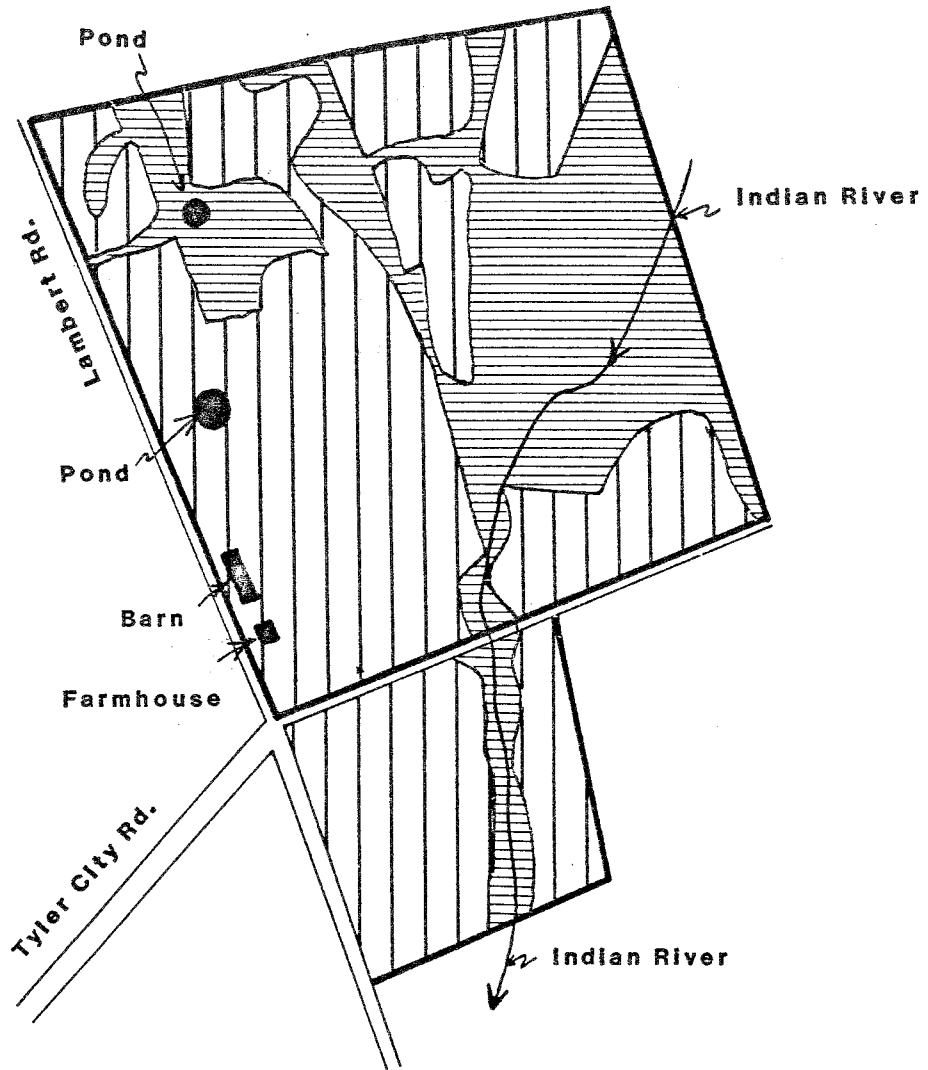


As reflected in its name, the Meadowbrook Farms property has a history of agricultural use. As shown in Figure 2, the property consists primarily of hayland, pasture, and woodland. The Helen Ewen farmhouse and barn, located on the property at the intersection of Tyler City and Lambert Roads, are the only structures present on the property.

The owner of "Meadowbrook Farms" may be interested in selling the property in the near future. In light of this, the Town Conservation Commission is interested in exploring opportunities available for protection of the open space and

# Figure 2

## Land Use



SCALE  
1" = 660'

agricultural value of the property. As one of the few remaining farms in Orange, and due to the close proximity of the property to the center of town, Meadowbrook Farms is viewed as a valuable and unique natural resource. One of the options being considered by the Conservation Commission is town purchase of the property. The town has the right of first refusal on the purchase of the land. Another option being explored is the state purchase of development rights of the property.

The Orange Conservation Commission requested this environmental review to assist them in their deliberations on the land. Specifically, the ERT was asked to identify the natural resource base of the property and to discuss opportunities and limitations of the site for farm management, recreation and open space use, wildlife management, and vegetation management.

If the property is not purchased by the town, it may be developed for residential use. For comparative purposes, therefore, the town has also requested information on the development potential of the property and an analysis of the probable environmental impact if the property is developed for residential purposes rather than protected for open space or agricultural use.

The King's Mark Executive Committee considered the Town of Orange's request for an ERT study, and approved the project for review by the Team.

The ERT met and field reviewed the site on October 24, 1984. Team members participating on this project included: Marc Beroz, Soil Scientist, U.S.D.A. Soil Conservation Service; Randi Lemmon, Land Planner, Housatonic Valley Association; Richard Lynn, ERT Coordinator, King's Mark RC&D Area; Don Smith, Forester, CT Department of Environmental Protection; William Warzecha, Geohydrologist, CT Department of Environmental Protection; Irene Winkler, Soil Conservationist, U.S.D.A. Soil Conservation Service.

Prior to the review day, each team member was provided with a summary of the proposed study, a checklist of concerns to address, a topographic map, a soils map, and a soils limitation chart. During the ERT's field review, team members met with representatives from the Town of Orange and walked the property. Following the field review, individual reports were prepared by each team member and forwarded to the ERT Coordinator for compilation and editing into this final report.

This report presents the Team's findings. The report identifies the natural resource base of the site and discusses opportunities and limitations for alternate land uses. It is hoped the information contained in this report will assist the Town of Orange and the landowner in making environmentally sound decisions.

If any clarification of the report is required, please contact Richard Lynn (868-7342), Environmental Review Team Coordinator, King's Mark RC&D Area, Sackett Hill Road, Warren, Connecticut, 06754.

\* \* \* \* \*



## II. Highlights

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1. *Approximately 35 acres or one-third of the site consists of inland wetland soils. These wetlands perform important hydrological and ecological functions. In preparing plans for the future use of this property, consideration should be given to protecting the character and functions of these wetland areas. (p. 7)*
2. *Development of the property for residential use will lead to increases in stormwater run-off. Assuming a moderate density of development (i.e., 30-one acre lots), these increases are expected to be comparatively small (3-4%). However, since a flooding problem is already known to exist along Indian River, any increases could further aggravate flooding conditions. Therefore, if the property is developed for residential purposes, it is recommended that a detailed stormwater management plan and erosion and sediment control plan be prepared. (p. 11)*
3. *This property, with the exception of the wetland areas, has good potential for hiking, picnicking, sledding, cross country skiing, etc. All the soils including the wetlands also provide opportunities for observing wildlife and studying ecology. The latter activities could supplement the school system's science program. (p. 17)*
4. *The Meadowbrook Farms site currently contains about 44 acres of prime and important farmland soils. If stones and boulders were removed from two areas on the site, an additional 16 acres would qualify for a total of about 60 acres of prime and important farmland soils. (p. 17)*
5. *The Meadowbrook Farms site currently provides a healthy diversity of wildlife habitat types which can be expected to be utilized by a variety of wildlife species. Development of the property for residential purposes would diminish the present wildlife value of the property. Preservation of the property for agricultural or open space use on the other hand, would help protect the present value of the property from a wildlife standpoint. (p. 19)*
6. *The hayland on this site has the potential to be managed more intensively than it is at the present time to increase production. Opportunities also exist for producing other crops that are marketable in the regional area including fruit trees, strawberries, and vegetables. (p. 20)*

7. *The forest land on this property may be divided into four distinct forest stands. Selective thinning, as proposed in two of the stands, would not only provide a crop (i.e., firewood), but would also serve to improve the health and vigor of the residual trees. Any trails constructed in the woodland as part of this thinning operation could serve in the future as recreational trails. (p. 21)*
  
8. *A pond of one acre or more created on the property could provide significant fishing recreation for both children and adults. The pond could be stocked with largemouth bass, bullhead, golden shiner, and possibly bluegill sunfish. (p. 23)*
  
9. *Meadowbrook Farms represents a unique natural resource for the Town of Orange. Protection of the prime and important farmland on the property would be particularly desirable. To facilitate protection of the prime and important farmland, the town and landowner are encouraged to seek the state purchase of development rights. In the event this effort is not successful and the property does go on the market, the town is encouraged to explore fee purchase of all or part of the property by either the town or a conservation land trust. This would facilitate protection of the farmland and open space value of the property. Should town or land trust purchase not prove feasible, flexibility in land development patterns (e.g., clustering) should be promoted by the town to protect the farmland and other valuable resources of the property. It would be desirable to explore all three of the above options simultaneously to help ensure the protection of the important resources of the property. (p. 24)*

### III. Geology

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The property is located within the Ansonia topographic quadrangle. The U.S. Geological Survey has published a bedrock geologic map (Map GQ-426) which was prepared by Crawford E. Fritts. A surficial geologic map (QR-23) prepared by Richard Foster Flint has been published by the Connecticut Geological and Natural History Survey.

#### BEDROCK GEOLOGY

Numerous bedrock exposures are visible, mostly in the northwest corner of the property. Fritts classifies the rock underlying or cropping out on the site as a subunit of Wepawaug Schist. It consists of a medium to dark gray, medium-to-fine-grained, well layered phyllite composed of the minerals quartz, muscovite, chlorite, and albite. Minor minerals include pyrite, rutile, tourmaline, apatite, zircon and dustlike carbon. The term "phyllite" refers to a metamorphic rock (rock altered by heat and temperature) which is composed mainly of mica minerals such as muscovite and chlorite. The presence of these minerals gives the surface of this rock a silky sheen. Phyllite rocks found on the site part relatively easily and have a slightly greasy feeling. As phyllite rocks are subjected to increased metamorphism, they grade into a schist rock.

According to GQ-426, a very small area on the north-central boundary of the property is underlain by an igneous rock (rock formed from molten magma) called diabase. It is a dark gray to dark greenish-gray rock composed of the minerals calcic labradorite, augite, pigeonite and magnetite. These rocks intruded the surrounding rocks (Wepawaug Schist) after their formation and, therefore, are younger in age.

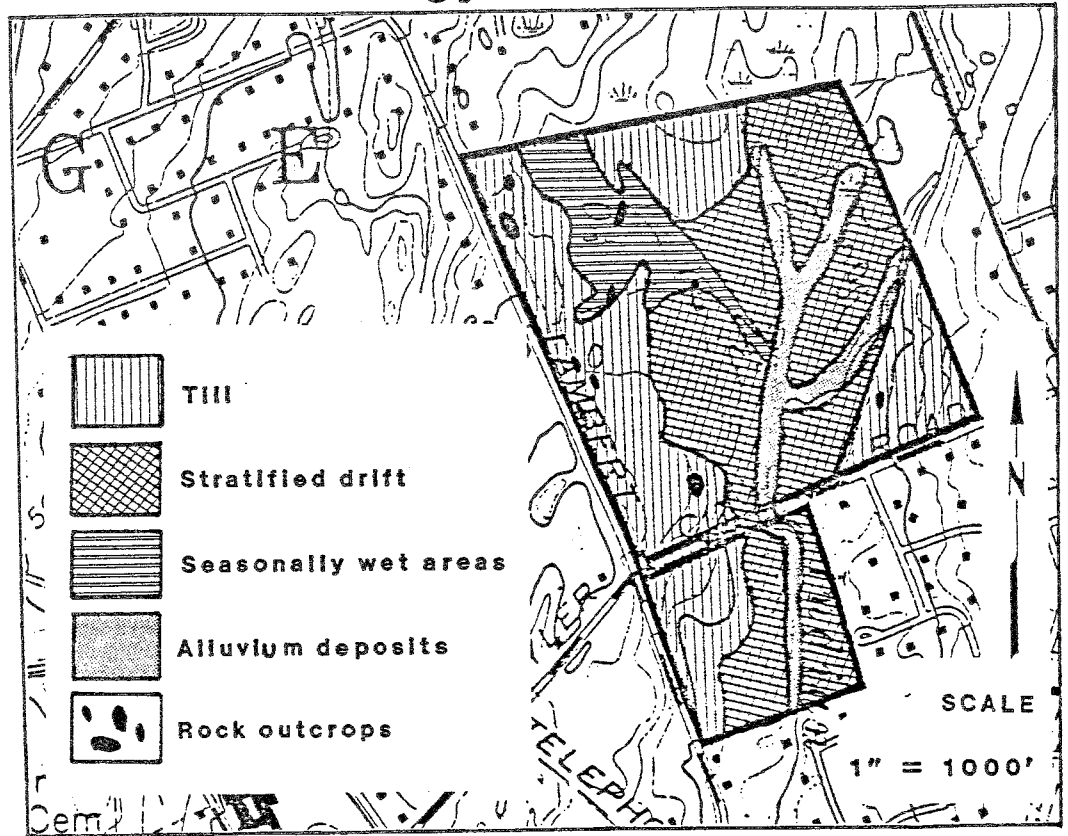
#### SURFICIAL GEOLOGY

Surficial geologic materials are those unconsolidated mineral and organic materials that overlie bedrock. On this parcel, the surficial deposits may be divided into four groups: till, stratified drift, alluvium, and swamp deposits (see Figure 3). Two types of glacial sediments predominate: till and stratified drift. As glacier ice moved through the region, it collected and transported rock particles and pre-existing overburden. Much of this transported debris was redeposited directly from the ice, either by being plastered onto the land from beneath the ice mass or by being let down gently as the ice wasted away. The resulting deposit was till. Because of its mode of deposition, till contains a nonsorted mixture of particles ranging in size from clay to large boulders. The till may be sandy, stony and loose, or silty, less stony and tightly compact. The thickness of the till is probably not more than 10 feet on this site. The shallowest soil cover is in the northwest corner of the parcel.

When the glacier ice began to melt, it sent forth streams of meltwater, often with torrential flows. These streams were filled with rock debris from the ice, and they

**Figure 3**

**Surficial Geology**



redeposited this debris in well-sorted to poorly sorted layers. Sand and gravel were commonly deposited near the ice, while silt and clay were washed further downstream to be deposited in lakes or in the sea. The resulting deposits are known as stratified drift. Based on the Map OR-23 and the soil survey for New Haven County, stratified drift covers the stream valley in the central and eastern parts of the property. Thickness of the stratified drift ranges from zero where bedrock outcrops to probably not more than 10 feet.

Alluvium, is a more recent surficial geologic deposit consisting of sand, silt and gravel. On the site, it occurs as a thin cover along the Indian River.

Overlying till or stratified drift in the northwest corner of the property are seasonally wet areas. These areas are delineated by the symbol Rn (Ridgebury, Leicester and Whitman soils) on the Soils Map accompanying this report (see Figure 6). These soils as well as the soils comprising the alluvium deposits are regulated inland-wetland soils.

Inland wetland areas perform important positive hydrological functions such as: (1) serving as a flood and stormwater retention area, which reduces downstream flood flows during periods of heavy precipitation; (2) improving surface water quality through various biochemical processes; and (3)

trapping sediments from upstream areas. From an ecological standpoint, they provide habitats for a wide diversity of plant and animal species. Wetlands can be used as valuable resource areas for educational purposes, passive recreational uses and scientific research. In preparing plans for the future use of this property, consideration should be given to protecting the character and functions of these wetland areas.

GEOLOGIC  
DEVELOPMENT  
CONCERNS

Town officials stated that if the property is not purchased by the town, it may be developed for residential use. Even if the town purchases the land for open space use and/or agricultural land preservation, there is a chance that parts of the property would be sold for residential development. The purpose of this would be to help offset the cost of purchasing the property. If residential development does occur under a town acquisition plan, it was indicated that it would probably not take place on the prime farmland.

The principal geologic limitations on the use of the property will be the following: (1) shallow depths to rock in the northwest corner of the parcel; (2) locally moderate to steep slopes; and (3) permanent and seasonally wet areas. In addition, the presence of till-based soils on the site may also be a limiting factor in terms of residential development. The reason for this is that these soils commonly have elevated groundwater tables, contain numerous stones, and have slow percolation rates. Since public sewers are not available, potential homes constructed within the parcel will require the installation of on-site sewage disposal systems. The above mentioned limitations will weigh heaviest on the ability to provide adequate subsurface sewage disposal systems. These limitations will require special engineering design in order to be surmounted. Wetland areas hold low potential for any type of development and should be avoided where possible.

Keeping in mind the prime farmland soils on the property, the most likely areas for residential development appears to be the land fronting Lambert Road in the northwest corner. It should be pointed out that in order to determine whether or not a septic system can be constructed on a particular lot, detailed soil testing which includes percolation tests and deep test holes will be necessary.

The sand and gravel soils (HkB, HkC and AfB) on the site should not present a major problem for septic system effluent to leach into the ground, depending on the system location. However, because of the highly permeable nature of these types of soils, a leaching system may have an adverse effect on groundwater and/or surface water. The soil may not adequately filter and renovate the sewage effluent as it moves through the soil, particularly where the groundwater level tends to be high and where bedrock is at shallow depths. Based on visual observations, the latter condition may occur in the central parts of the property.

## **IV. Water Supply**

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Currently the municipal water supply services dwellings on Lambert Road and Tyler City Road. Therefore, if residential development does occur, the availability and proximity of the water service to potentially developed parts of the property would appear to be feasible and appropriate. Connection to the public water line would also provide maximum protection and afford greater flexibility when considering means for on-site sewage disposal.

If there is a desire to drill a well(s), bedrock underlying the site appears to be the only other practical source of water for the site. Depending on its thickness as well as other hydrogeologic characteristics, sand and gravel deposits may yield small to large amounts of groundwater to wells. However, the sand and gravel on the site appears to be too thin for a water supply source.

Bedrock is commonly capable of providing small but reliable yields of groundwater to individual wells. A survey of bedrock wells in the Quinnipiac River basin (see Connecticut Water Resources Bulletin No. 27) indicates that more than 80 percent of those wells that were drilled into a rock type similar to that found on the site yielded 4 gallons per minute, while 10 percent yielded 25 gallons per minute or more. A yield of 3 gallons per minute should adequately serve most domestic uses.

The natural quality of the groundwater should be good. There is a chance that elevated levels of iron and/or manganese may be encountered in well water. Depending upon the levels, it may be necessary to treat the water drawn from potential wells with an appropriate filtering device.

## **V. Flood Hazard Areas**

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A Flood Boundary and Floodway Map for the town of Orange has been prepared by the Federal Emergency Management Agency. This study includes maps which identify areas throughout the town that are subject to flooding during the 100 and 500 year storms. The map also shows the Indian River floodway. A '100' year flood is a flood with a one chance in 100 or a 1 percent chance that it will happen in any year. A '500' year flood would have a one chance in 500 or a 0.2 percent chance of occurring in any given year. It should be pointed out that this does not mean a flood of the magnitude mentioned above will occur only once in a 100 or 500 year period. The probability of occurrences remains the same each year regardless of what happened the year before.

According to the map, the '100' year flood boundary parallels the Indian River in the eastcentral parts of the property. Also, the boundary extends along a tributary to Indian River in the northern parts of the property. The '500' year flood boundary fringes the outer limits of '100' year flood boundary on the west side of the river north

of Tyler City Road. South of Tyler City Road, the '500' year flood fringes the '100' year flood boundary on both sides of the river. Figure 4, which was adapted from the FEMA map for Orange, identifies the floodprone areas on the site.

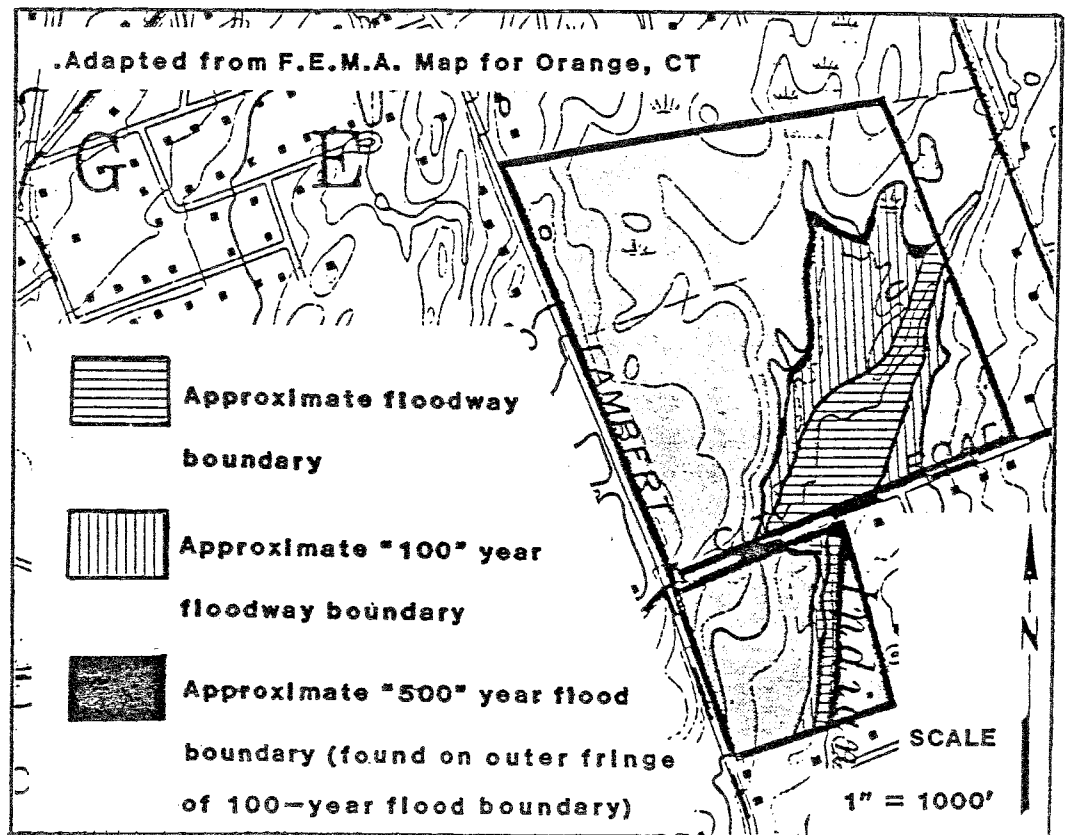
There may be swampy or topographic depressions within the site subject to wetness and perhaps flooding during periods of particularly heavy rain. One such area may be in the northwest corner of the property in the area delineated as Rn (Ridgebury, Leicester and Whitman soils) on the accompanying soils map (see Figure 6).

## VI. Hydrology

The "Meadow Brook Farms" site lies within the Indian River watershed (see Figure 5). Surface water on the property flows downslope into Indian River or is intercepted by any

**Figure 4**

### Flood Hazard Areas



of the intermittent streamcourses traversing the site. These streamcourses ultimately route the water into Indian River. Indian River empties into Indian Lake south of the property.

As mentioned earlier, if the town does not acquire the farm, there is a possibility that the land may be sold for residential development. Depending upon the density of

dwellings and more importantly the amount of impervious surface created, development of the land for residential use will cause increases in peak flows to Indian River. These increases will also arise from the removal of vegetation.

It is possible to estimate the increases in runoff and peak flows for existing conditions and for the increases that might be experienced following residential development. The Team's geologist has prepared such estimates, not only for present conditions but also for a conceptual subdivision of 30-one acre lots for single family dwellings constructed on the site.\* It was assumed that construction of the homes would front on the existing town roads (i.e., Tyler City Road and Lambert Road). These estimates do not account for possible drainage re-routing through man-made structures. The method used to make these estimates is outlined in the Soil Conservation Services' Technical Release No. 55. Estimates were made for the 10 year storm, 25 year storm, 50 year storm and 100 year storm. These storms occur on a statistical average of once every 10, 25, 50 and 100 years, respectively, but any of the storms have a chance of occurring in any given year. Peak flows were calculated for the point at which Indian River passes underneath Porter Lane, south of the site. The watershed for that point is shown in Figure 5. Runoff increases were calculated as average depths of runoff for the drainage area as a whole. Results are given in the following tables. It must be remembered that the figures below are meant only to indicate the prospective magnitudes of the increases; they are not designed to indicate absolute flow rates (which may be greater or less than the corresponding estimates) nor should they be used for engineering design purposes.

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\*This intensity of development was chosen for discussion and comparative purposes only. More intensive development would likely result in greater hydrological impacts, less intensive development would result in lesser impacts.



TABLE I

Estimated average runoff depths (inches) for the drainage area as a whole.

	<u>10 yr</u> <u>storm</u>	<u>25 yr</u> <u>storm</u>	<u>50 yr</u> <u>storm</u>	<u>100 yr</u> <u>storm</u>
Present Conditions	1.96"	2.40"	2.95"	3.60"
Post Development (30-1 acre lots with 20% imperviousness)	2.04"	2.49"	3.04"	3.70"
% Increases	4%	4%	3%	3%





TABLE II

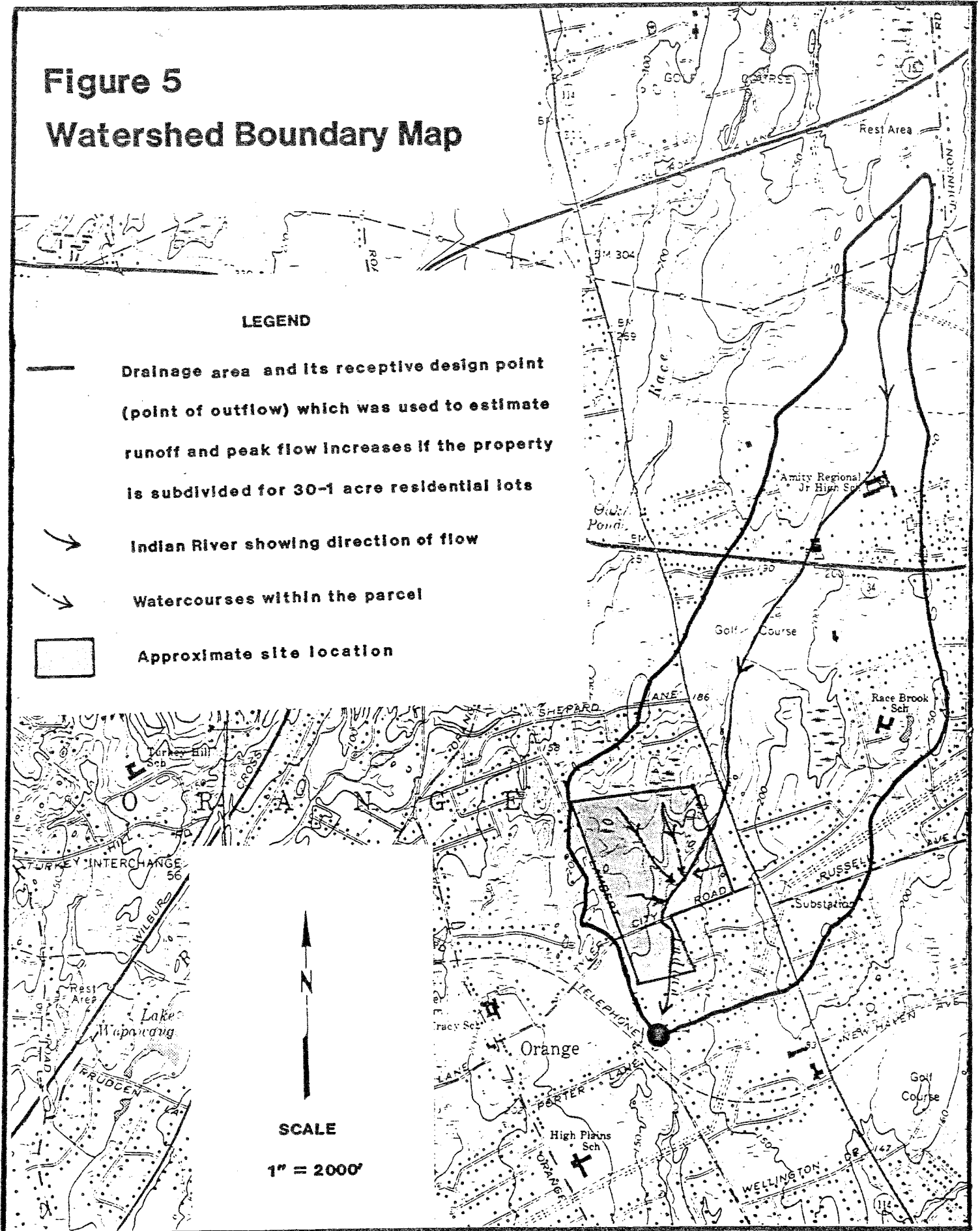
Estimated peak flows (cubic feet per second) where Indian River passes under Porter Lane.

	<u>10 yr</u> <u>storm</u>	<u>25 yr</u> <u>storm</u>	<u>50 yr</u> <u>storm</u>	<u>100 yr</u> <u>storm</u>
Present Conditions	345 cfs	447 cfs	582 cfs	738 cfs
Post Development (30-1 acre lots with 20% imperviousness)	359 cfs	464 cfs	599 cfs	759 cfs
% Increases	4%	4%	3%	3%

**Figure 5**  
**Watershed Boundary Map**

**LEGEND**

-  Drainage area and its receptive design point (point of outflow) which was used to estimate runoff and peak flow increases if the property is subdivided for 30-1 acre residential lots
-  Indian River showing direction of flow
-  Watercourses within the parcel
-  Approximate site location



As the figures in Table II indicate, peak flow increases to Indian River following development of a 30-1 acre lot subdivision on the site may be expected to be slight. However, since a flooding problem is already known to exist in the area of the design point (a town Commission member indicated to the Team that flooding problems occur at the culvert passing under Porter Lane during heavy rainstorms) any increases could further aggravate flooding conditions in the area as well as other downstream areas. Therefore, if the property is developed for residential use, it is recommended that a detailed storm water management plan, which includes hydraulic calculations, be devised for town review. In this regard, a detention pond may be a likely resolution for handling post development flows. If only one or two homes were constructed on the parcel, it does not appear that peak flows would be increased enough to significantly aggravate existing flooding problems to Indian River.

The runoff volumes in Table I suggest that increases will be less than 5 percent for development of a 30 one acre lot residential subdivision. The increased runoff volumes are important in terms of the additional sediment that could be carried away from the watershed. In view of the moderate slopes at various points on the parcel, it is recommended that a comprehensive erosion and sediment control plan be developed if the land is subdivided. Erosion and sediment control measures should be shown on the subdivision site plan.

## **VII. Soils**

Figure 6 and the following narrative are a revision of data contained in the Soil Survey of New Haven County, Connecticut. The symbols on the map identify map units. Each map unit has a unique composition of soils. Areas with the same symbol have the same composition.

### **SOIL DESCRIPTIONS**

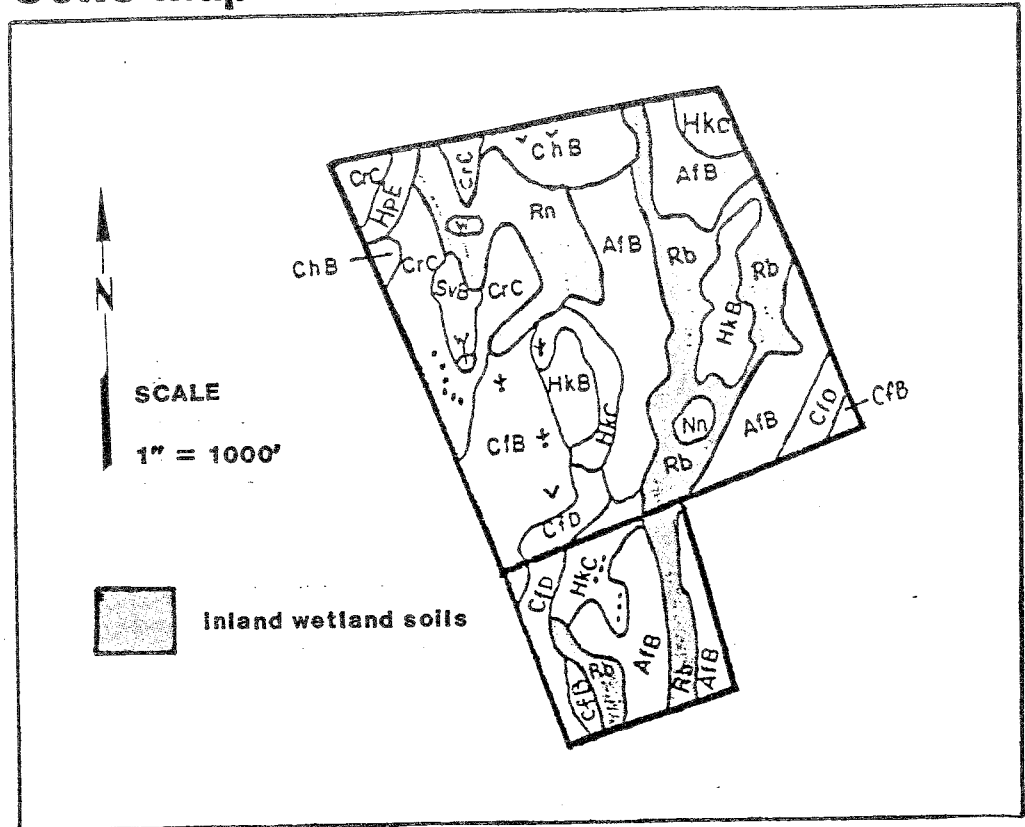
Map Unit AfB - This map unit is composed primarily of Agawam soils on 3 to 8 percent slopes. These soils are very deep and well drained. Typically they have a fine sandy loam surface layer over stratified sands and gravels to a depth of 60 inches or more.

These soils are well suited for passive recreational use but some land leveling would be required to develop ballfields. Should this area be developed for ballfield use, the depth of cuts in the leveling operation should not exceed 20 to 30 inches since this may expose the coarse substratum materials. This coarse material results in droughty conditions for plant growth.

The Agawam soils are well suited for roads and buildings. These soils have a fast percolation rate however. Hence, there is a danger that septic systems installed in these soils may pollute the ground water as the soils may not adequately filter the septic effluent. Large lot sizes generally lessen the dangers of ground water pollution.

**Figure 6**

**Soils Map**



Map Unit CfB - This map unit is composed primarily of Charlton soils on 3 to 8 percent slopes. These soils are very deep and well drained. Typically they have fine sandy loam textures to a depth of 60 inches or more.

Land leveling would be required to develop ballfields in this area. These soils are well suited for urban development. Roads, buildings and septic systems can be easily built.

Map Unit CfD - This map unit is composed primarily of Charlton soils. These soils are the same as those described above in the narrative for CfB except that these soils are on 15 to 25 percent slopes.

The steep slopes make these soils poorly suited for ballfields or homesite development.

Map Unit ChB - This map unit is similar to the CfB unit described above, except that up to 3 percent of the soil surface is covered by stones and small boulders. These soils are on 3 to 8 percent slopes.

Ballfields can be developed if the site is graded and rocks removed. The soils are also well suited for urban development.

Map Units CrC and HpE - These map units are composed of two soils that are so intermingled on the ground that they cannot be separated on the map. One kind of soil is named Hollis. These soils are shallow and somewhat ex-

cessively drained. Typically the Hollis soils have fine sandy loam textures over hard bedrock at a depth of 10 to 20 inches.

The other soil is named Charlton. The Charlton soils are very deep and well drained. Typically they have fine sandy loam textures to a depth of 60 inches or more.

The Hollis soils are poorly suited for ballfields and residential development due to their shallow depth to bedrock and slope.

The Charlton soils are poorly suited for ballfields due to slope. These soils provide good building sites on slopes of less than 15 percent.

The Charlton soils are dominant in the CrC map unit and the Hollis soils are dominant in the HpE map unit. Slopes are dominantly 3 to 15 percent on CrC and 15 to 35 percent on HpE.

Map Units HkB and HkC - These map units are composed of Hinckley soils. These soils are very deep and excessively drained. Typically the Hinckley soils have a gravelly sandy loam surface layer over sands and gravels to a depth of 60 inches or more.

These soils are poorly suited for ballfields. Extensive grading would be required to develop level playing surfaces. During grading operations the coarse substratum would be exposed. The exposed sands and gravels would provide a poor medium for plant growth.

These map units have good potential for residential development. There is a danger that septic systems installed in these soils may pollute the ground water, however. Large lot sizes generally take care of this problem.

Slopes are dominantly 3 to 8 percent on HkB and 8 to 15 percent on HkC. The Hinckley soils on the west side of the property adjacent to the Indian River have up to 3 percent of their surface covered by stones and boulders.

Map Unit Nn - This map unit is composed of Ninigret soils on 0 to 3 percent slopes. These soils are very deep and moderately well drained. Typically Ninigret soils have a fine sandy loam surface over sands and gravels to a depth of 60 inches or more. They have a seasonally high water table between the depths of 1.5 and 3.0 feet.

These soils have fair potential for ballfields. The playing surface will tend to remain soggy for extended periods during the spring and fall.

These soils have fair to poor potential for community development. The high water table can result in wet basements and failing septic tank absorption fields unless they are specially designed.

In addition, these soils have a fast percolation rate. Large lot sizes will be required to avoid contamination of the ground water by septic tank absorption fields.

Map Unit SvB - This map unit is composed of Sutton soils on 3 to 8 percent slopes. These soils are very deep and moderately well drained. Typically Sutton soils have fine sandy loam textures to a depth of 60 inches or more. These soils have a seasonally high water table between the depths of 1.5 and 3.0 feet.

The Sutton soils have fair potential for ballfields due to the seasonally high water table. The playing surface will remain soggy during the wetter periods of the year.

These soils have fair potential for residential development. The high water tables will cause wet basements and failing leach fields unless special design is used.

Map Units Rb and Rn - These map units are composed of poorly and very poorly drained soils that are inland wetlands. These soils are very deep and have a water table at or near the soil surface for much of the year.

The Rb unit is composed of Raypol soils on 0 to 3 percent slopes. Typically these soils have very fine sandy loam and silt loam textures overlying gravelly sand to a depth of 60 inches or more. In the wooded areas, the surface of these soils, is covered by up to 3 percent stones and boulders.

The Rn unit is composed of Leicester soils on 0 to 3 percent slopes. Typically these soils have fine sandy loam textures to a depth of 60 inches or more.

These Raypol and Leicester soils have poor potential for active recreation or community development due to their high water tables.

## SPECIAL SYMBOLS

The following symbols have been used on Figure 6 to denote small areas contrasting with the surrounding soils.

<u>Symbol</u>	<u>Meaning</u>
.....	short 15 to 25 percent slopes
V	exposures of bedrock
⚡	wet spot
W	pond

## PASSIVE RECREATION

This property, with the exception of the wetland areas, (Rb and Rn), has good potential for hiking, picnicing, sledding, cross country skiing, etc. All the soils including the wetlands also provide opportunities for observing wildlife and studying ecology. The latter activities could supplement the school system's science program.

## FARMLAND

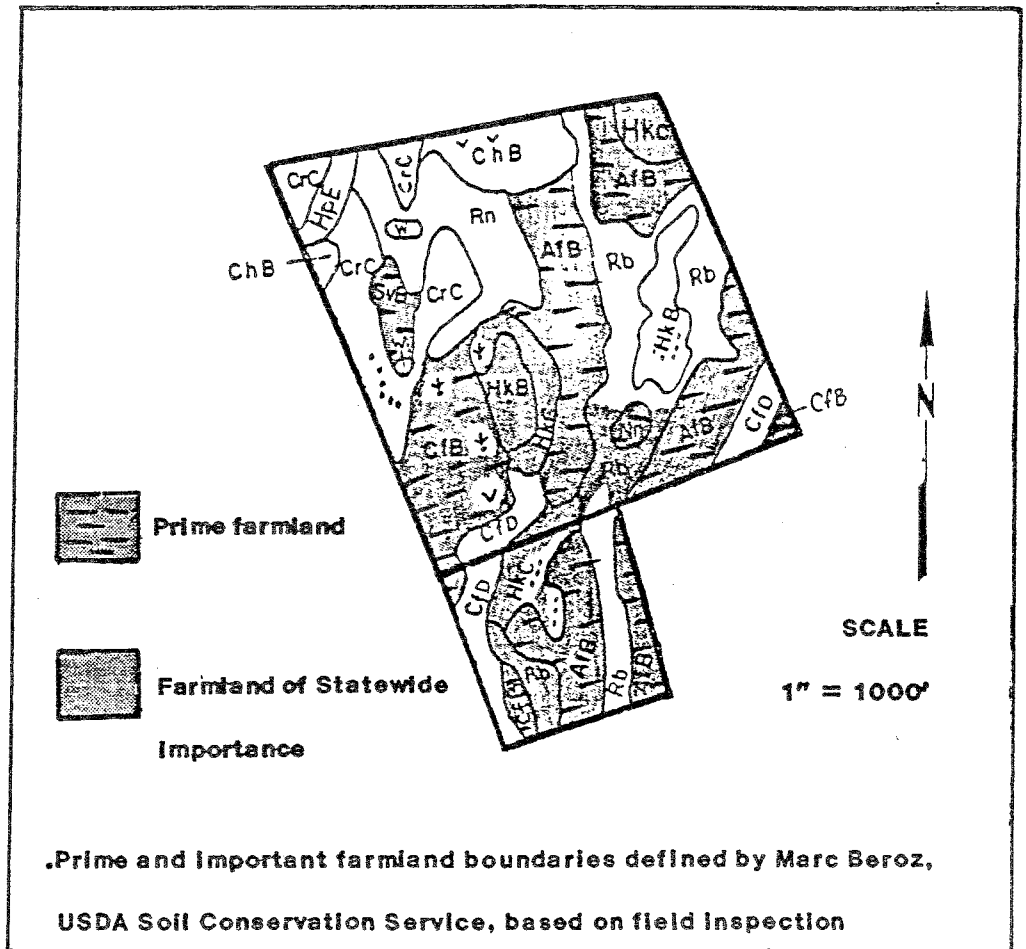
Prime farmland is land that has the best combination of physical and chemical characteristics for producing crops. The map units that qualify as prime on this property are: AfB, CfB, Nn and SvB. These map units cover approximately 32.4 acres of the site.

Farmlands of Statewide Importance is land that does not qualify as prime but that can economically produce high yields with proper management. The map units that are in this category are: HkB, HkC and Rb. Although these map units cover approximately 28 acres of the site according to the New Haven County Soil Survey, on-site inspection reveals that only about 11.7 acres of this area would truly qualify as Farmland of Statewide Importance in the opinion of the Team's Soil Scientist (see Figure 7).

The HkB map unit immediately adjacent to the Indian River on the west side of the property was not included in the acreage calculation because of the stones and boulders on its surface. The wooded areas of Rb were excluded from the acreage tally for the same reason. Should these stones and boulders be removed, the soils would qualify as important farmland.

**Figure 7**

**Prime and Important Farmland Soils**



## VIII. Wildlife Habitat Management

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Meadowbrook Farms is composed of three major wildlife habitat types: mixed hardwood forest, openland (pasture and hayland), and wetland.

The mixed hardwood habitat is composed predominantly of red maple, red and white oak, hickory, black birch and beech. Understory vegetation includes saplings, some spicebush, maple-leaved viburnum, some ironwood, skunk cabbage, ground pine and wood violet. Squirrels, rabbit, fox, deer, raccoon, ruffed grouse and several non-game species would utilize habitats of this type.

To create a diversity of habitat in the wooded areas and to increase the amount of edge, scattered openings could be created within the woodland. Openings approximately 1/4 to 1 acre in size, irregular in shape and oriented east to west will encourage fruit producing shrubs. Brush may be piled along the edges of these openings to provide wildlife cover for small mammals and birds.

The openland habitat consists of pasture and hay fields. Grasses predominate with some alfalfa and clovers. Some shrub and woody vegetation encroachment is occurring by hardwoods, cedar, and multiflora rose.

Open field borders in proximity to forested land provide vegetative diversity which benefits mourningdove, sparrows, robins, ruffed grouse, deer, raccoon and woodcock.

Open field habitat can be improved by increasing vegetative diversity and edge. An uncut border, approximately 15 feet in width could be left where the open field meets the forest. This border area, if created, should be mowed every 3 to 5 years (after August 1). Uncut field borders provide valuable food cover and shelter for many wildlife species. Some shrub components should be maintained and some fields should be cleared every three to five years to maintain an early vegetative successional stage for optimum wildlife management of the site.

The majority of the wetland habitat is wooded and composed of red maple. Grasses, rushes, sedges, skunk cabbage, viburnum, and spicebush also occupy the wetland areas. Many types and varieties of wildlife would frequent wetland areas such as this, including redwinged blackbirds, raccoons, various amphibians, reptiles and many other non-game species.

Wetland habitat can be improved by creating an open water environment. Ponds should be at least three to five feet deep to insure year round water. Wood duck boxes may be established within the wetland areas occupied by grasses and low shrubby vegetation.

According to the DEP's Natural Diversity Data Base, there are no records of rare or endangered species of either flora or fauna on this property. The wooded and wetland areas of this site have the potential for supporting such



species, however, and a thorough cataloging of the wildlife and vegetation on the site might identify such species.

The Meadowbrook Farms site currently provides a healthy diversity of wildlife habitat types which can be expected to be utilized by a variety of wildlife species. Development of the property for residential purposes would diminish the present wildlife value of the property. Preservation of the property for agricultural or open space use on the other hand, would help protect the present value of the property from a wildlife standpoint.

## **IX. Vegetation Management**

### **A. OPEN LAND**

The open land occupying the Meadowbrook Farms property is managed as hayland or as pastureland. A mixture of alfalfa and grasses compose the hayfields. One-cutting is usually taken off of these hayfields each year. This is not an intensive management program for the land.

Alfalfa is a first choice crop for protein, energy and yield. Alfalfa is the most productive and long-lived on deep, well drained, fertile fields having a pH of 6.5 or higher. To maintain high yields over many years, alfalfa must receive good fertility and cutting management. Alfalfa will yield well on a 2-cut, or even a 3-cut schedule.

Mixtures of grasses and legumes for perennial forage production are generally preferred to seeding either alone. Mixtures increase the productive stand life. Overall production is increased and harvest problems are minimized.

When grown with legumes, grasses will provide some protection to legumes against heaving injury and utilize nitrogen from legumes for growth. Generally the soils occupying what is presently managed for hay provide the proper depth and drainage to support an excellent alfalfa/grass (Timothy, Orchardgrass, Bromegrass) haycrop or pasture for foraging animals.

Approximately 5 acres of pasture land in the north central portions of the property are considered poorly drained. A different type of forage would be expected here. Clovers will grow on soils too poorly drained for alfalfa. Timothy associates well with clovers and will tolerate the poor drainage but will not survive intensive grazing.

While most of the fields are managed as hayland or pastureland, an attempt has been made at Christmas tree production. This is an alternative that allows the manager to diversify the farm operation and provide an income from a market different than that from production of beef cattle.

Alternatives exist for producing other crops that are marketable in the area. However, these alternatives are highly dependent on the willingness of the owner or operator to invest large sums of money to start-up production.

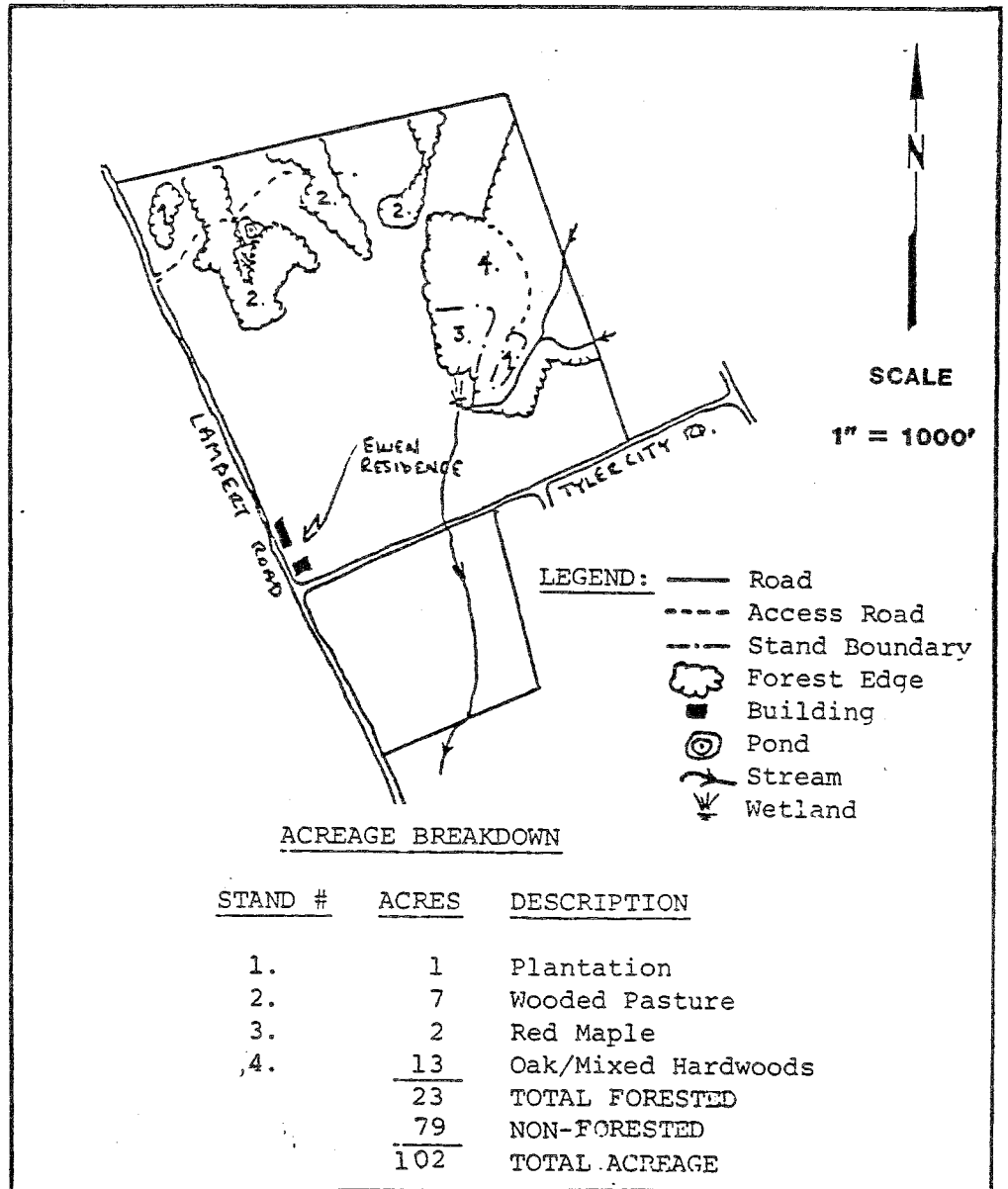
Production of fruit trees, strawberries, vegetables and even vineyards are alternatives. All, however, may require irrigation and more intense labor than is presently used.

B. WOODLAND

As shown in Figure 8, the forest land on this property may be divided into four distinct forest stands. Each of these stands is described below together with its potential for forest management. Selective thinning, as proposed in two of the stands, would not only provide a crop (i.e., firewood), but would also serve to improve the health and vigor of the residual trees. Any trail constructed in the woodland as part of this thinning operation could serve in the future as recreational trails.

Figure 8

Forest Stand Map



Stand #1. Plantation, 1 acre. This overstocked plantation is composed of fair quality, pole-sized\* Norway spruce in the western parcel and white pine in the eastern parcel. These trees are growing at a fair rate on a medium quality growing site and are approximately 20 years old.

Due to heavy crown cover the understory and ground cover are spotty. Pastures of ground pine can be found in the eastern parcel.

Both parcels of this stand are in need of a thinning to promote active growth. Additionally, the white pine area should be released from competition with the surrounding hardwoods.

Stand #2. Wooded Pasture, 7 acres. This understocked stand is composed of fair quality, pole to sawlog-sized white oak, red oak, hickory, black birch, and red maple. These trees are growing at a good rate on a medium quality growing site and are approximately 40-60 years old.

The understory is primarily composed of patches of heavy barberry and multiflora rose. Due to heavy grazing little else has been able to become established.

The ground cover here is composed almost exclusively of grasses.

No forest management of this area is envisioned.

Stand #3. Red maple, 2 acres. This wellstocked stand is composed of fair quality, pole to sawlog-sized red maple with scattered red oak and hickory on the drier margins. These trees are growing at a fair rate on a good quality growing site and are approximately 40-60 years old.

The understory species encountered include saplings and spicebush.

The ground cover here includes wood nettle, violet, and skunk cabbage.

Due to past thinning and salvage activity, no management activity is necessary for a period of 10 years.

Stand #4. Oak/Mixed Hardwoods, 13 acres. This wellstocked stand is composed of good quality, pole to sawlog-sized red oak, white oak, black birch, beech, red maple, and hickory. These trees are growing at a medium rate on a good quality growing site and are approximately 50-70 years old.

The understory species encountered include sapling to pole growth of beech, black birch, and red maple; maple-leaved viburnum; scattered spicebush; and scattered ironwood.

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\*seedling size - less than 1" in diameter at breast height (d.b.h.)

sapling size - 1-5 inches in d.b.h.

pole size - 5-11 inches in d.b.h.

sawlog size - 11 inches and larger in d.b.h.

The ground cover here includes wood violets, patches of ground pine, and wild geranium.

Although wood cutting has been occurring in the stand in the last 5 years, there appears to be room for removal of additional poorly formed pole-sized trees. Products from this thinning and weeding would be almost exclusively firewood.

## **X. Fisheries**

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Indian River is likely to be inhabited by black nose dace, fallfish, creek chub, common shiner, and white sucker. Some warmwater pond species such as common sunfish and largemouth bass may be present as juveniles, having entered the stream as young-of-the-year during annual spring flooding. It is unlikely, however, that these species survive through the winter in the stream. Small numbers of brook trout may also inhabit the stream. They would be limited to the few pockets of water capable of providing acceptable habitat (four ppm oxygen,  $\leq 68^{\circ}\text{F}$ , cover from predators). Most likely this would be where a small volume of spring water enters the brook through the substrate. This is a typical situation in the many small brooks and streams across the State of Connecticut having very marginal trout habitat. Their population density is low, size of the trout is small (generally 3-4.5 inches), and they do not provide for any significant recreational fishing.

A pond created on the property may provide significant fishing recreation for both children and adults. It is recommended that the pond be at least one acre in size and that much of its depth be greater than 10 feet. This will help prevent the extensive growth of aquatic vegetation and the winterkill of fish. The creation of extensive shallow shoreline areas should be avoided. It is also recommended that the dam be equipped with a drain pipe and valve capable of completely draining the pond. The pond should be stocked with the following: largemouth bass adults, largemouth bass juveniles, bullhead, golden shiner, and possibly bluegill sunfish. The fisheries office of the DEP Western District (485-0226) should be contacted if recommended stocking densities of the various species are desired, and to obtain a listing of operating commercial fish hatcheries. It should also be noted that if the Indian River is to be dammed to create an impoundment, a diversion permit is required from the State DEP.

## **XI. Land Use and Planning Considerations**

### **A. SITE DEVELOPMENT CONCERNS**

The Meadowbrook Farms site represents a unique natural resource for the Town of Orange. Some of the unique attributes that this site exhibits are:

- . The property helps retain the Town of Orange's rural New England character;
- . The largest tract of open land still remaining in the town center;
- . One of the largest blocks of prime and important farmland remaining in close proximity to New Haven and Bridgeport;
- . One of the most, if not the most, diverse wild-life habitats in close proximity to the town center. (The site is home to fox, deer, grouse, squirrels, raccoon, opossum, etc.);
- . One of the most scenic open space parcels left in town;
- . An important watershed buffer for the Indian River;
- . One of the few remaining sites well suited for an array of educational and passive recreational pursuits.

Given the uniqueness of this site to the Town of Orange, any future change in ownership, management or development of the property should be undertaken with protection or enhancement of these attributes in mind. At a minimum, the following goals would be desirable:

1. Protection of the Indian River Flood Plain
2. Protection of as much of the prime and important farmland as possible
3. Retention of as much of the open space frontage along Lambert and Tyler City roads as possible.

This property is zoned for 1 acre residential lots. Conceivably, with the percentage of prime and important farmland soils present on this site, 60 or more one-acre house lots could ultimately be developed. Should such a scenario occur, most, if not all, of the natural resource attributes listed above would be destroyed or significantly altered.

B. GENERAL SITE  
DEVELOPMENT  
SUGGESTIONS

Given that the site may change ownership in the near future, the following general development criteria are suggested:

- . Minimize development of areas identified as prime and important farmland soils as identified in Figure 7 of this report.
- . Minimize strip development along Lambert and Tyler City roads.
- . Minimize development in close proximity to Indian River (< 100').
- . Identify areas suitable and appropriate for development and buffer them from the remainder of the site.
- . Concentrate or cluster development within areas suitable and appropriate for development in order to minimize road and utility development and impact.

C. CONSERVATION/  
DEVELOPMENT  
ALTERNATIVES

In Planning and Zoning Memorandum Number 5, prepared by Consultant Robert S. Bryan & Associates for the Orange Planning and Zoning Commission entitled "Farmland Current Status, Significance and Alternatives" October 15, 1983, the importance and plight of the Town of Orange's remaining farmland tracts is highlighted and several general alternatives for preserving them are offered. Two that merit special attention here are Flexibility in Land Development Patterns and Purchase of Development Rights. One more alternative that this report recommends for consideration is Direct Purchase in Fee Simple of All or Part of the Site by the Town of Orange or a Land Trust. These three alternatives will be presented individually as follows:

- A. Flexibility in Land Development Patterns -  
As this site is zoned for one acre residential lots, with the probability that most of these lots would ultimately be sited on the farmland acreage recommended herein as desirable for preservation, some type of inducement (development flexibility) is needed to shift development away from those areas of conservation importance.

For purposes of discussion only, assume 60 one acre lots could be legitimately developed on this site. In order to persuade a landowner/developer to preserve the lands of conservation importance (e.g., prime farmland), he/she must be given the opportunity to employ alternative development designs such as 60 units clustered on a smaller area of the property. In this manner, the landowner/developer merely shifts development away from the farmland without giving up value.

B. Purchase of Development Rights (PDR) -  
Memorandum #5 gave extensive coverage to this method of agricultural land protection. Essentially, a PDR program entails a government entity (in Connecticut, the State Department of Agriculture) acquiring the development rights from a farmland owner via a conservation easement. The easement prohibits development of the land under the easement. In exchange for this removal of development rights from the property, the landowner is payed the difference between the property's value before the restriction was placed on it and the land's value after its restriction.

For highly developable land in urbanizing areas, this "development rights value" can often exceed 90% of the property's total value. For instance, a \$15,000/acre property may have a value of only \$1,500/acre once the property's development rights have been removed. The \$13,500/acre value would be the costs of the development rights.

This method of land conservation appears at first to be expensive; but if a community evaluates the cost of purchasing the development rights to a key open space parcel versus the long term cost to the town in providing emergency, educational and other services to a housing development on such a property, then the initial cost of the development rights becomes more palatable.

C. Fee Purchase of All or Part of the Property by the Town of Orange or a Conservation Land Trust -  
Another alternative to be considered is out right purchase of the site by the Town of Orange or by a conservation land trust. Purchase of part or all of this site by the Town or Orange could serve to meet conservation, education and recreational short-term objectives while land banking the property for future synergistic town uses and needs.

Acquisition of part or all of the site by a land trust could serve many of the same objectives as town purchase, with the exception that a land trust would have greater flexibility and latitude in pursuing options for recouping some or all of this investment by means of limited development and resale.

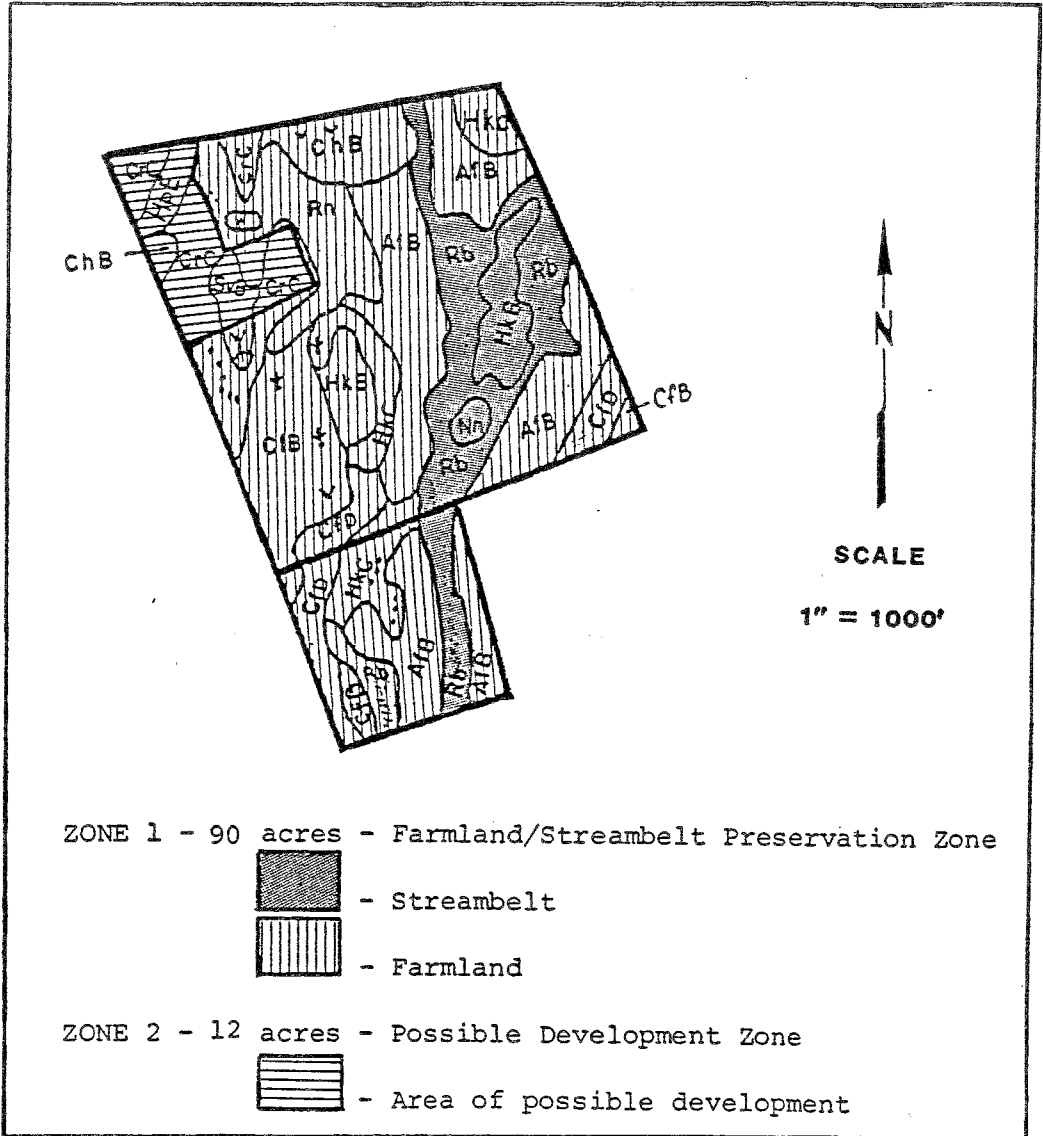
Examples of such actions by a town can be seen in the Towns of Fairfield and Redding, and by local land trusts in Roxbury and Sherman.

D. SPECIFIC CONSERVATION/ DEVELOPMENT SUGGESTIONS

In the event the Meadowbrook Farms should be placed on the market for sale, the following suggestions are offered for consideration. These suggestions are presented as "design zones" (see Figure 9) for visual reference.

Figure 9

Design Zones



Zone 1 - Farmland/Streambelt Preservation Zone - 90 acres -  
 As discussed in the soils section of this report, approximately 45 acres of prime and important farmland soils on this site are currently cleared and used for limited agricultural purposes. These acres represent some of the best agricultural lands remaining in Orange. An additional 45 acres consists of wetland, floodplain, and streambelt areas that would be desirable to protect. In the event the preservation of this 90 acre Zone cannot be achieved by purchase of its development rights or by full fee simple acquisition, this report recommends



that consideration be given to preservation by other methods such as clustering development on the remaining 12 acres of the site and placing this zone #1 in an open space category.

This report strongly encourages the Town of Orange, working in concert with the State Department of Agriculture, to acquire at least the development rights to this 90 acre Farmland/Streambelt Zone.

Zone 2 - Development Zone - This 12+ acre zone is located in the northwest corner of the site adjacent to Lambert Road. Development of this area would have the least negative impact on the agricultural and streambelt preservation goals as enumerated earlier in this report of any area on this site. If future development should occur on this property, it should be concentrated within this 12+ zone if possible. However, if more development is required than can be accommodated within this 12 acres, consideration should be given to expanding the development zone only enough to accommodate the required additional development.

The type of development that could be accommodated on this 12 acre tract might include conventional one acre house sites; smaller lot, single family detached (clustered) units; or higher density condominium/apartment units.

#### E. CONCLUSION

To conclude, Meadowbrook Farms represents a unique natural resource for the Town of Orange. Protection of the prime and important farmland on the property would be particularly desirable. To facilitate protection of the prime and important farmland, the town and landowner are encouraged to seek the state purchase of development rights. In the event this effort is not successful and the property does go on the market, the town is encouraged to explore fee purchase of all or part of the property by either the town or a conservation land trust. This would facilitate protection of the farmland and open space value of the property. Should town or land trust purchase not prove feasible, flexibility in land development patterns (e.g., clustering) should be promoted by the town to protect the farmland and other valuable resources of the property. It would be desirable to explore all three of the above options simultaneously to help ensure the protection of the important resources of the property.

\* \* \* \* \*

# ABOUT THE TEAM

The King's Mark Environmental Review Team (ERT) is a group of environmental professionals drawn together from a variety of federal, state, and regional agencies. Specialists on the team include geologists, biologists, foresters, climatologists, soil scientists, landscape architects, recreation specialists, engineers, and planners. The ERT operates with state funding under the aegis of the King's Mark Resource Conservation and Development (RC&D) Area - a 47 town area in western Connecticut.

As a public service activity, the team is available to serve towns and developers within the King's Mark Area --- free of charge.

## 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 the review of a wide range of significant activities including subdivisions, sanitary landfills, commercial and industrial developments, and recreation/open space projects.

Reviews are conducted in the interest of providing information and analysis that will assist towns and developers in environmentally sound decision-making. This is done through identifying the natural resource base of the 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 an administration agency such as planning and zoning, conservation, or inland wetlands. Requests for reviews should be directed to the Chairman of your local Soil and Water Conservation District. This request letter must include a summary of the proposed project, a location map of the project site, written permission from the landowner/developer 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 King's Mark RC&D Executive Committee, the team will undertake the review. At present, the ERT can undertake two reviews per month.

For additional information regarding the Environmental Review Team, please contact your local Soil Conservation District Office or Richard Lynn (868-7342), Environmental Review Team Coordinator, King's Mark RC&D Area, P.O. Box 30, Warren, Connecticut 06754.