ENVIRONMENTAL REVIEW TEAM REPORT

WEST WOODS - SKIFF MOUNTAIN AREA
KENT & SHARON, CONNECTICUT

KING'S MARK
RESOURCE CONSERVATION & DEVELOPMENT AREA

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OCTOBER 1981

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

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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

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
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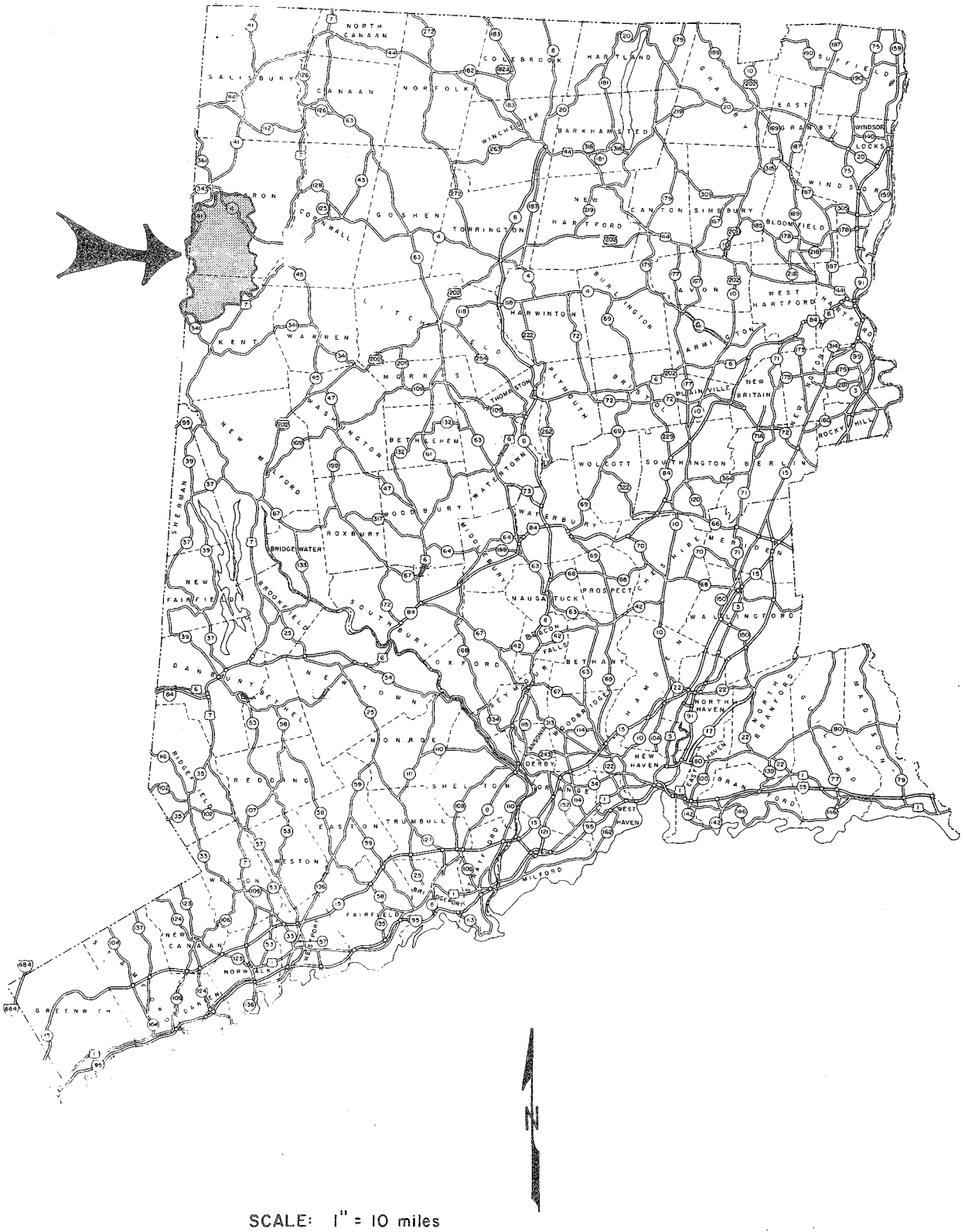
TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LOCATION OF STUDY SITE

WEST WOODS - SKIFF MOUNTAIN AREA
KENT & SHARON, CONNECTICUT



SCALE: 1" = 10 miles

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ENVIRONMENTAL REVIEW TEAM REPORT
ON
WEST WOODS-SKIFF MOUNTAIN AREA
KENT AND SHARON, CT

I. INTRODUCTION

This report is an outgrowth of a request from the towns of Kent and Sharon for an ERT study of the West Woods-Skiff Mountain Area.

The West Woods-Skiff Mountain Area is ± 28 square miles in size, encompasses four major watersheds, and is located astride the Kent/Sharon town line. As shown in Figure 1, the topography of the area is diverse. The land is mostly undeveloped and is characterized by rugged uplands, wetlands, and extensive forested tracts. The land is zoned for residential use with minimum lot sizes of one and two acres.

This ERT study was initiated by the West Woods-Skiff Mountain Property Owner's Association, a group of landowners interested in preserving the character of the area without unfairly restricting residential development. Both the towns and the property owners association are interested in learning more about the natural resources of the subject area so that future planning and development can be accomplished in an environmentally sound manner.

The ERT was asked to provide the towns and the Association with 1) a natural resource inventory and analysis of the subject area and 2) a discussion of relevant land use and planning considerations. The King's Mark Executive Committee considered the town's request and approved the project for review by the Team.

The ERT met and field reviewed the area on February 25, 1981. Team members participating on this review included:

Chuck Boster	Regional Planner	Northwestern Conn. Regional Planning Agency
Art Cross	District Conservationist	USDA Soil Conservation Service
Steve Dunn	Transportation Planner	Northwestern Conn. Regional Planning Agency
Ralph Goodno	Landscape Architect	Housatonic Valley Association
Russ Handsman	Archaeologist	American Indian Archaeological Institute
Steve Jackson	Wildlife Biologist	Conn. Department of Environmental Protection
Lee Markscheffel	Regional Planner	Northwestern Conn. Regional Planning Agency
Bob Orciari	Fishery Biologist	Conn. Department of Environmental Protection
Nancy Parent	Ecologist	Conn. Department of Environmental Protection

Rob Rocks	Forester	Conn. Department of Environmental Protection
Frank Schaub	Sanitary Engineer	Conn. Department of Health
Mike Zizka	Geohydrologist	Conn. Department of Environmental Protection

Prior to the review day, each team member was provided with a summary of the proposed project, a checklist of concerns to address, and a detailed soil survey map and topographic map of the subject area. 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. It is important to understand that the ERT is not in competition with private consultants and hence does not perform design work or provide detailed solutions to development problems. The ERT concept provides for the presentation of natural resources information and preliminary land use analyses. All conclusions and final decisions rest at the local level. It is hoped the information contained in this report will assist the towns of Sharon and Kent, and the West Woods-Skiff Mountain Property Owners Association, in making environmentally sound decisions.

If any additional information 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

As many of the following highlights attest, much of the West Woods-Skiff Mountain area presents severe limitations for residential development. Nevertheless, portions of the study area are highly suitable for residential development. In discussing the "limitations" of the land for development, the Team does not wish to discourage growth, but rather to promote it on the basis of land suitabilities and capacities.

This report does not present a "plan" for the West Woods-Skiff Mountain area. Rather, it provides a data base and a series of alternatives which can be implemented to help protect the character of the West Woods-Skiff Mountain area. It is hoped that this report will serve as a springboard for future discussions and planning in the West Woods-Skiff Mountain area.

1) The West Woods-Skiff Mountain area is characterized by widespread rockiness which presents a severe limitation for residential development. Within such areas the land is best suited for a relatively low intensity of development. (p. 8)

2) A recent hydrogeology study suggests that in till-covered areas such as the present study locale, residential development should not exceed one unit per acre if both on-site wells and septic systems are utilized. Less favorable soil conditions, such as shallow to bedrock areas, may require even more stringent standards for residential density. Based upon these conclusions, it would seem clear that the Housatonic Highlands section of the study area, encompassing about 75% of the total study area, should be developed at a density that is less than one unit per acre. The section northwest of Mill Brook, on the other hand, probably could be developed at one unit per acre if so desired. These comments are not meant to imply that no development should occur on lots smaller than one acre; however, large clusters or zones of sub-acre lots probably should be avoided. (p. 11)

3) Those areas least suitable for development in the study area include streambelt and wetland corridors, significant prime farmlands, and shallow to bedrock soils on slopes of 15-35% or greater. These areas make up about 50% of the project site. Other areas vary considerably as to their potential and limitations for development; proposed changes in land use on these areas should therefore be considered on a case by case basis. (p. 13)

4) The most significant concentration of prime farmlands in the study area is found within the Mill Brook, Sharon watershed. Decision-makers should be aware of the importance of preserving prime farmland for the production of food, feed, etc. Actions that put high quality farmland in irreversible uses should be initiated only if these actions are clearly in the public interest. (p. 13)

5) According to USGS topographic mapping, there are twelve major ponds in the study area and nine major streams. Streams flowing within the area are small, have good water quality, and likely support a healthy fishery population. Most of the ponds within the area are shallow and provide a warm water fisheries habitat for such species as largemouth bass, chain pickerel, yellow perch, and sunfish. Eastman and Fullers Pond are probably sufficiently

deep to support trout as well as warm-water fish species. Due to limited access, recreational fishing in the area is limited. The fisheries resources within the study area are not presently being affected significantly by non-point sources of pollution. (p. 15)

6) *Streams and ponds in the area would be best protected from the effects of future development if buffer strips of natural vegetation (25 foot minimum) were left intact. Settling basins to capture silt from roads and new developments should be installed where needed and regularly maintained. (p. 16)*

7) *To curtail the eutrophication of ponds in the area, which results in nuisance growths of aquatic weeds and algae, efforts should be taken to control excessive fertilizer application to lawns, gardens, and fields; to properly maintain septic systems; and to control soil erosion. (p. 16)*

8) *Approximately 10 percent of the land in the study area consists of wetlands. Maintaining wetlands in their natural state will protect water quality, help control flooding and soil erosion, and benefit wildlife. (p. 20)*

9) *Major portions of the West Woods-Skiff Mountain area are suitable for forest management. When properly prescribed and executed, forest management practices will increase the production of forest products, improve wildlife habitat, and enhance the overall condition of the woodland. (p. 23)*

10) *The West Woods-Skiff Mountain area offers excellent wildlife habitat. With sound wildlife management, the area has even greater potential. Where possible, efforts should be taken to maintain and enhance this valuable wildlife heritage. (p. 26)*

11) *Present zoning regulations in the study area permit subdivision of property with minimum one and two acre lots served by on-site sewage disposal and water supply facilities. Most of the land within the area is marginally suited for on-site sewage disposal due to one or more limiting characteristics such as shallow soil covers over bedrock, seasonally high ground water, poorly drained soils, or severe slope conditions. There are, however, pockets of well-drained soils which are more suitable for on-site sewage disposal. Careful consideration should be given to land development and subsurface sewage disposal in order to minimize the impact on surface and groundwaters. In the mountainous areas, it cannot be assumed that a suitable leaching area will be available just on the basis of large lot size. Although local zoning may require only one or two acre lots, soil, slope, and ledgerock conditions may dictate lot sizes significantly larger than minimum codes. Detailed soil testing must be performed in order to identify suitable leaching areas within proposed lot lines. (p. 27)*

12) *The concept of cluster zoning with respect to sewage disposal may be desirable where favorable soil site conditions exist. (p. 28)*

13) *A major effort should be made by both Kent and Sharon to assure well trained individuals are available to witness all soil testing, and provide valuable feedback to town planning and zoning commissions, prior to the approval of property development. (p. 29)*

14) *Generally, the balance of the study area is heavily wooded and the majority of the scenic views are found in the farmland areas. Consideration should be given to preparing an in-depth study, with as much citizen involvement as possible, to identify additional sensitive or scenic lands within the study area which should be protected. These areas should be mapped and added to overall open space plans for the Towns of Sharon and Kent. (p. 30)*

15) *Incentives should be considered in the subdivision regulations to encourage creative development which will work to protect important farmland, surface and groundwaters, streambelts, and the scenic views in the study area. (p. 30)*

16) *While few field studies have been conducted in the West Woods-Skiff Mountain area, previous investigations elsewhere and archival records suggest that numerous archaeological resources may exist. These sites are of varying ages associated with both the prehistoric and historic eras and will be subjected to varying adverse effects if the area is subjected to intensive residential development. Since much of that projected development would be initiated and financed entirely within the private sphere, extant federal or state preservation law does not offer such resources any viable protection. Further, the contemporary political climate indicates strongly that local preservation statutes--which would intensify governmental regulations--would be met with skepticism and defeat. Currently the American Indian Archaeological Institute is attempting to respond to this problem through educational programs as well as the development of an archaeological conservancy. Nevertheless local officials and commissioners should understand that Litchfield County's landscape is covered with hundreds of archaeological resources whose age varies between 10,000 B.P. and the turn of the twentieth century. The fabric of such cultural resources is fragile and easily destroyed, resulting in the loss of non-renewable records. (p. 31)*

17) *Population projections by the State Office of Policy and Management indicate that through the year 2000, Sharon's population will increase roughly 1% every 5 years while in Kent the population growth will average 3-5% every five years for the same time period. (p. 35)*

18) *The towns of Kent and Sharon should seriously consider taking steps to preserve the scenic roads in the West Woods-Skiff Mountain area through promoting state scenic road enabling legislation and establishing appropriate local regulations. (p. 38)*

19) *The existing state and local road system in the West Woods-Skiff Mountain area is more than adequate to meet present and future needs. Present traffic is well below capacity and there are no serious safety problems. There is no need to pave any of the existing gravel roads although West Woods Road does carry traffic considerably in excess of the maximum for dirt roads as recommended by some traffic authorities.*

Maintenance, especially in times of fiscal restraint by all levels of government, is and will always be a problem. The increasing cost of petroleum based surfacing products only aggravates the situation. This factor and the influence of the town aid dirt road fund may well lead to more dirt roads in the future or at least curtail any impetus to pave the existing ones. Therefore, towns should be sure to keep abreast of dirt road maintenance practices and keep the dirt roads well maintained so that a need to pave will not exist. (p. 38)

20) *The quality of the environment in the West Woods-Skiff Mountain area is to a great degree linked to the streams and their associated lands. Within these "streambelt corridors" are vital natural resources that deserve priority consideration with respect to land use planning and management. Consideration should be given to establishing a streambelt system which will help to conserve these natural resources while also permitting and encouraging their wise use. The USDA Soil Conservation Service has developed a methodology, described in the text of this report, for defining and protecting streambelt corridors. (p. 39)*

21) *Zoning is the principal tool utilized in Connecticut today to control the density of development in residential areas. Whether to re-zone any or all of the West Woods-Skiff Mountain area is a local decision and beyond the scope of this report to address in detail. Two options which should be considered however are: 1) the use of soils information in zoning and, 2) providing for cluster development. Under the first option, minimum lot sizes are established, in part, by the characteristics of the underlying soils. A steeply sloping, rocky piece of land would therefore require a larger minimum lot size than a well drained, gently sloping parcel. The NWCRPA has prepared a manual on "Using Soil Information in Zoning". Under cluster zoning, homes can be grouped in one area of a parcel while the remainder can be preserved as open space, farmland, scenic buffer, etc. This concept can help to preserve the undeveloped, scenic character of the area as seen from the roads. It is important to note that overall density of a parcel should not change with clustering. (p. 43)*

22) *With the presence of important forestry, agricultural, energy, and water resources in the study area, efforts should be taken to properly manage and protect these resources through sound forest management, judicious farmland protection, use of solar and wind energy, and erosion and sediment control. (p. 45)*

23) *Serious consideration should be given to the creation of a town or area-wide conservancy whose purpose is to promote the goal of proper land management. This group could be responsible for 1) working with property owners to encourage sound forest management, 2) seeking protection of critical lands through property donations and conservation easements, 3) assisting property owners and developers in laying out environmentally sound development plans and 4) working to preserve prime farm lands in the area. (p. 46)*

III. RESOURCES INVENTORY

A. Topography

The West Woods-Skiff Mountain watershed areas are located mostly in a topographic region known as the Housatonic Highlands. The valley of Mill Brook represents the approximate western boundary of the Highlands, separating the region from an area of more rolling land and different geology. The Highlands themselves are rugged, knobby, and generally steep. The bedrock surface, as opposed to the overlying glacial sediments, clearly controls the landscape. Major individual peaks are rare; Macedonia Brook State Park and the Mitcheltown section of Sharon contain what are perhaps the most prominent peaks. Elsewhere, an abundance of minor peaks is present. Skiff Mountain and Silver Hill, for instance, are really only two roughly linear collections of small summits. If the region has a general topographic lineation, it is oriented northeast-southwest, but the pattern is indistinct at best. The Housatonic River valley imposes a dramatic break in the landscape at the eastern boundary of the Highlands. From the top of Ellsworth Hill, which at 1551 feet above mean sea level is the highest point in the study area, the land drops eastward to an elevation of about 372 feet at the mouth of North Kent Brook, the lowest point in the study area. The distance between the two points is only about 2.5 miles. The steepest area is the half-mile wide strip of land immediately northwest of the Housatonic River: slopes in that area are generally greater than 25 percent and frequently in excess of 40 percent.

In contrast to the Housatonic Highlands, the study area northwest of Mill Brook has gentle to moderate slopes and broad, relatively well-separated peaks. Bedrock control of the topography is less certain in this area; the overlying glacial sediment is probably more than 50 feet thick in some hills. In addition, the bedrock geologic differences between this area and the Housatonic Highlands have helped to "soften" the landscape.

B. Geology

The study area is located mostly within the Ellsworth topographic quadrangle and partly within the Amenia quadrangle. There is presently no published geologic information specific to those quadrangles. Preliminary data for the Ellsworth quadrangle is on file at the Department of Environmental Protection's Natural Resources Center in Hartford.

The Housatonic Highlands topographic region, roughly bounded by Housatonic River and Mill Brook, is composed primarily of gneisses, which are lineated metamorphic rocks. Metamorphic rocks are rocks which have undergone changes as a result of very high pressures and/or temperatures. Generally, these changes include recrystallization, altered mineral composition, and alignment of elongate minerals. In gneisses, thin layers of elongate minerals alternate with layers of more rounded minerals, giving the rocks a streaky or banded appearance. The major mineral constituents of the gneisses are quartz, feldspar, mica, and hornblende; minor constituents include garnet, graphite, diopside, and sillimanite. The gneisses may be interlayered with schists in some places. Schists are metamorphic rocks with a strongly developed foliation due to an abundance of aligned elongate minerals (usually mica). Other interlayered rocks include amphibolite (rocks rich in amphiboles, a certain mineral group), quartzite (quartz-rich metamorphic rocks), and calc-silicate rocks. Cross-cutting and roughly concordant veins or masses of igneous rock (rocks formed directly from a molten state) are present throughout the area. The dominant gneisses of the region are resistant to weathering and erosion, which at least in part explains the rugged nature of the topography.

Northwest of Mill Brook, the study area is composed of dolomite marble and calcitic dolomite marble. A product of the metamorphism of limestones and dolomitic limestones, the marbles are softer, more easily erodable rocks than the gneisses. This helps to explain both the relatively low elevations of this area and the rounded appearance of the landscape. Although the marble may have economic value as a source of lime, the rock may be too deeply buried in most places to warrant excavation. The most prominent outcrops of marble in the study area are 2000 feet west of the Bolland District Cemetery, along Route 41 one mile south of the cemetery, and along Route 41 near the Sharon Country Club.

Bedrock in most of the study areas is covered by thin sediments of glacial origin. The average thickness of these sediments in the Housatonic Highlands area is probably 15 feet or less. Thicker deposits cover the bedrock in at least part of the area northwest of Mill Brook. Most of the glacial sediment is till, which was deposited directly from an ice sheet (see Figure 2). Till contains a variable mixture of rock particles and fragments ranging in size from clay to large boulders. The till is commonly sandy, stony, and loose in the upper few feet, but silty, less stony, and very compact at greater depths. Compact till is commonly called "hardpan" because of its obdurate resistance to excavation with hand tools.

Sandy and gravelly sediments that were deposited by glacial meltwater streams may be found in a few areas, primarily along Mill and Macedonia Brooks. Their economic value is probably small because of the limited volume, but they may have local significance as sources of construction aggregate. The only other fairly widespread surficial geologic materials in the study area are swamp sediments and alluvium. Swamp sediments are simply accumulations of decayed organic material mixed with silt, sand, and clay in wet areas. They are distributed throughout the study area, and generally occur as a thin (less than 10 feet thick) "skin" over bedrock, till, or sand and gravel. Alluvium consists of relatively recently deposited stream channel and floodplain sediments. These materials are generally coarse-grained (sandy and gravelly), but they may include layers of silt.

Shallow depths of overburden to bedrock will undoubtedly be one of this area's most limiting conditions for development. Because of the rural character of the land, creation or extension of public sewer and water lines is unlikely to occur. On-site wells and septic systems will therefore be required. In general, a standard (non-engineered) septic system requires at least 7 feet of overburden. Clearly, much of the West Woods-Skiff Mountain territory does not meet that criterion. On the other hand, overburden depths may vary considerably even in a relatively small area, so that it may be possible to find deep pockets of overburden amidst an otherwise rocky site. Detailed testing will therefore be necessary before most locations can be conclusively either accepted or rejected for different land-use proposals. In general, however, it seems safe to conclude that the West Woods-Skiff Mountain area would be better adapted to a relatively low intensity of development, because of its widespread rockiness.

C. Hydrology

The West Woods-Skiff Mountain area as defined in this report, consists of four smaller watershed areas. A watershed, as the term is used in this report, is simply an area from which a particular stream or water body receives all

of its drainage. When used in this manner, the term has meaning only in relation to a particular point of flow. If one were concerned with the entire watershed of a stream, one would select the point of flow at which the stream discharges into a water body or into a different stream. Since the Team's study in this case was restricted more to particular boundaries of land ownership rather than to natural resource boundaries, the flow points selected for the watershed areas in the report are, for the most part, arbitrary.

In general, groundwater flow patterns in the various watersheds should conform to surface-water flow patterns. The groundwater drainage divides should therefore not be significantly different from the surface divides. Nevertheless, many minor differences in flow patterns probably exist, particularly where bedrock is close to the surface. In addition, artificially induced flow patterns may be caused by pumping of wells. Where dense or large-scale developments are planned, the latter factor may become very important.

None of the streams that flow through the study area are gaged. Nevertheless, statistical data provided in Connecticut Water Resources Bulletin No. 21 allows one to estimate typical flows in the local streams. Some of these estimates are provided in Table A.

The source of the stream flows at the designated discharge points is runoff from both the surface and the ground. Rain or melting snow may run directly over the land into the streams or into their tributaries, or it may pass into and through the ground, ultimately coming to the surface again in a downslope spring, seep, wetland, stream, or water body. The quality of the water as it moves through this portion of its natural cycle will depend to a great extent on the types of materials with which it comes in contact. In addition, man may interrupt the natural flow patterns of the water, diverting it for residential, industrial, or other purposes, and possibly returning it to the land via septic systems or other means.

Natural soils are regarded as a highly effective medium for removing contaminants from water. Soil organisms and oxygen help to destroy harmful bacteria and viruses in wastewater, while fine soil particles filter out or absorb suspended materials. The soil does not always provide complete treatment, however. In particular, dissolved chemicals such as nitrates may not be eliminated from percolating groundwater. Additionally, minerals in the bedrock and overburden may be a source of iron, manganese, calcium, and other elements. Nevertheless, runoff from developed areas and discharges of wastewater from houses or other buildings may receive a considerable cleansing in the soil. The problem is determining how much stress, in the form of polluted water, can be placed on the soil before its renovative ability is overtaxed. Different soils have different capacities for wastewater renovation. In general, the deeper and better drained a soil is, the better is its ability to purify water. This is not a hard-and-fast rule, however. Nitrates may actually be a bigger problem with well-drained soils than with poorly drained soils

Although soil characteristics are very important in the consideration of various possible land uses, it is difficult to make recommendations based only upon soil characteristics. Many soil limitations can be overcome by suitable engineering practices while other limitations may have no satisfactory solutions. A shallow depth to bedrock, for instance, may be overcome by placement of artificial fill over the natural soil. The limitations of a deep peat and muck soil, on the other hand, may be effectively insoluble. Of course, even soils with limitations that can be "engineered around" should not be treated

TABLE A. Estimated flows at discharge points of the watersheds in the study area (in cubic feet per second and million gallons per day).

Stream	Drainage area	Flow exceeded 99% of the time (very low flow)	Flow exceeded 90% of the time (low flow)	Flow exceeded 50% of the time (median flow)	Flow exceeded 10% of the time (high flow)	Flow exceeded 1% of the time (very high flow)*
Macedonia Brook	5.35 sq. mi.	0.07 cfs 0.05 mgd	0.39 cfs 0.25 mgd	3.57 cfs 2.30 mgd	18.56 cfs 11.96 mgd	46.41 cfs 29.91 mgd
Mill Brook	11.56 sq. mi.	0.15 cfs 0.10 mgd	0.83 cfs 0.53 mgd	7.53 cfs 4.86 mgd	39.18 cfs 25.25 mgd	97.94 cfs 63.12 mgd
Guinea Brook	3.50 sq. mi.	Too low to estimate by method used	0.05 cfs 0.03 mgd	2.32 cfs 1.50 mgd	12.57 cfs 8.10 mgd	32.87 cfs 21.18 mgd
Pond Mountain Brook	3.27 sq. mi.	Too low to estimate by method used	0.04 cfs 0.03 mgd	2.10 cfs 1.35 mgd	11.35 cfs 7.31 mgd	29.67 cfs 19.12 mgd
North Kent Brook	1.42 sq. mi.	Too low to estimate by method used	0.02 cfs 0.01 mgd	0.95 cfs 0.61 mgd	5.16 cfs 3.32 mgd	13.49 cfs 8.69 cfs
Stewart Hollow Brook	0.80 sq. mi.	Too low to estimate by method used	0.01 cfs 0.01 mgd	0.54 cfs 0.35 mgd	2.91 cfs 1.87 mgd	7.60 cfs 4.90 mgd
Stony Brook	1.81 sq. mi.	Too low to estimate by method used	0.03 cfs 0.02 mgd	1.21 cfs 0.78 mgd	6.57 cfs 4.24 mgd	17.19 cfs 11.08 mgd

*Note: The flow rates given in this table as "very high flows" should not be confused with peak flood flow rates, which last for only a few minutes or hours and which may be many times greater than the flows given here.

as automatically appropriate for development: in many instances, poor design of rectifying measures, or poor follow-through on a good design, may leave the soil as bad as or worse than it was initially. For example, it is easy to claim that fill placement will solve a high water table problem, but the fill must have appropriate textural characteristics and must be placed in such a way that wastewater won't just leak out at the base. The key to appropriate development of marginal soil areas is enforcement of effective mitigating practices.

Since septic systems, rather than sewers, are likely to be the principal waste-disposal method in the Skiff Mountain-West Woods area it may be helpful to consider a study done by hydrogeologist T. L. Holzer on septic-system usage in Northeastern Connecticut.* Holzer concentrated on nitrates produced by the operation of septic systems, because nitrates are not readily renovated in the soil. Nitrates in groundwater must therefore be diluted in order to achieve acceptable levels for drinking-water purposes. Holzer's analysis suggested that, in till-covered areas such as the present study locale, residential development should not exceed one unit per acre if both on-site wells and on-site septic systems are to be utilized. Holzer noted that his analysis was tailored to well-drained soils, and stated that unfavorable soil conditions, such as shallowness to bedrock, may require more stringent standards for residential density in some areas. Using his conclusions as a basis, it would seem clear that the Housatonic Highlands section of the study area (see Topography section) should be developed at a density that is less than one unit per acre. The section northwest of Mill Brook, on the other hand, probably could be developed at one unit per acre. None of the foregoing discussion is meant to imply that no development should occur on lots smaller than one acre; however, large clusters or zones of sub-acre lots probably should be avoided.

D. Soils

A detailed soils mapping of the West Woods-Skiff Mountain area is available from the Soil Conservation Service office in Litchfield (567-8288). Staff from the Soil Conservation Service office is also available to provide detailed soils interpretation information on specific parcels.

For the purposes of this report, the soils of the West Woods-Skiff Mountain area may be classified into five major natural soil groups. The geographic distribution of these natural soil groups is shown in Figure 3. A brief description of each of these soil groups is presented below together with comments on the general suitability of the soil groups for various land uses.

GROUP A - Terrace soils over sands and gravels (excluding the poorly and very poorly drained terrace soils).

These soils occur above flood plains in river and stream valleys. They are underlain by water--deposited beds of sand and gravel. In most places a few

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*Holzer, T. L., 1975, "Limits to Growth and Septic Tanks", in Water Pollution Control in Low-Density Areas: Proceedings of a Rural Environmental Engineering Conference, W. J. Jewell and R. Swan, eds., University Press of New England.

inches to three feet of loamy or fine sandy material cover the older, coarser water deposits. Nearly all sources of sand and gravel, and many of the important sources of water supply, are in areas associated with the terrace soils.

Although terrace soils are generally suitable for community development (i.e. earthmoving is readily done and soil conditions are favorable for buildings, parking lots, and landscaping), care must be taken not to pollute groundwater resources. Rapid percolation rates are characteristic of these sandy and gravelly soils and this can lead to inadequately renovated effluent or leachate reaching the underlying water table. Care must be taken therefore in siting septic systems and other facilities on these soils to avoid impairment of groundwater quality.

GROUP B - Upland soils over friable to firm (permeable) glacial till - (excluding the poorly and very poorly drained upland soils).

The soils in this group as well as those in the following two groups (Groups C and D) are all upland soils that were formed in areas of glacial till. Glacial till is the predominant unconsolidated overburden material (surficial geologic material) found in Connecticut today.

The soils in this group are formed in the thicker, unconsolidated deposits of till usually occurring on hillsides. They generally have good potential for community development except where steep slopes or stoniness present problems.

GROUP C - Upland soils over compact (non-permeable) glacial till (hardpan) - (excluding the poorly and very poorly drained compact till soils).

These upland soils occur mostly on the tops and slopes of drumlins (drumlins are hills that were smoothed and elongated north to south by the movement of glaciers). The soils are underlain by compact glacial till and have a hardpan or fragipan 16 to 36 inches below the soil surface. Permeability above the hardpan is moderate but the pan drastically reduces percolation. During wet seasons, excess water in the soil moves downslope above the hardpan. This characteristic presents a formidable obstacle in the design and construction of septic system absorption fields that function satisfactorily. Septic systems may be flooded by a seasonally high or perched water table and effluent may "break out" down slope of the septic system leaching fields. Careful design and engineering is also required to prevent groundwater seepage into basements and frost heaving of roads and driveways. Steep slopes and stoniness may also present problems in certain areas.

GROUP D - Upland soils - rocky and shallow to bedrock.

The soils in this group occur mostly in the rougher areas of the uplands. They may occupy narrow ridge tops but most often are on steep side slopes. They are characterized by stoniness and shallow depths to the underlying bedrock. In most places, hard rock is less than 20 inches below the soil surface. These areas provide contrast in the landscape and scenic overlooks, but in most cases pose severe limitations for urban development. Occasionally pockets of deeper soils can be found within this soil group which are more suitable for development purposes (e.g., an individual home site).

GROUP E - Inland Wetland Soils.

This group includes all soils classified as inland wetlands according to P.A. 155 as amended, Connecticut's Inland Wetlands and Water Courses Act. These soils typically have a water table within 6 inches of the soil surface during the wettest part of the year. The high water table often persists into late spring and may reoccur after prolonged or heavy summer rains. Some of these soils are very poorly drained and have water ponded on the surface for significant periods in winter and spring. By definition, well drained and moderately well drained flood plain soils also qualify as inland wetland soils in Connecticut.

Inland wetland soils present severe limitations for most urban uses. Development is very costly and requires complete alteration of the resource base. Intensive drainage and land fill measures are required to overcome wetness. Inland wetlands and watercourses are regulated in the State of Connecticut because they provide valuable functions and are critical, fragile, and irreplaceable natural resources. They are also an important part of the larger hydrologic system. Disturbance of these areas should be kept to a minimum.

CRITICAL SOIL AREAS

Figure 4 of this report identifies streambelt corridors (see discussion in Section IV-C of this report), significant prime farmlands, and shallow to bedrock soils on slopes of 15-35% or greater. These areas would be best suited for non-development uses.

The unshaded areas in Figure 4 vary considerably as to their potentials and limitations for development. Proposed changes in land use should therefore be considered individually. Soil suitability is a major factor which should be considered in determining lot sizes, commercial locations, road locations and layout, etc. It should also be noted that most of the soils with slight to moderate limitations for residential development also are well suited to the production of wood crops and food crops.

PRIME FARMLANDS AND ADDITIONAL FARMLANDS OF IMPORTANCE

The most significant concentration of prime farmlands and additional farmlands of importance in the West Woods/Skiff Mtn. area are found within the Mill Brook, Sharon watershed (see Figure 4). Elsewhere in the area, prime farmlands are rather isolated and of limited size.

Prime Farmlands

Prime farmland is best suited for producing food, feed, forage and fiber crops, and is also available for these uses. It may be idle, or used for crops, pasture, hay or forest. It is not in urban use or under water. Prime farmland has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods.

Prime farmland soils have an adequate and dependable water supply from rainfall or irrigation. They are warm enough and have a long enough growing season for adapted crops. They are neither too wet for crops nor subject to frequent flooding during the season of use. They are neither too acid nor too alkaline for good plant growth. They are permeable to water and air. They are not so stony that they interfere with cultivation by machinery. They are nearly level or gently sloping and are not highly erosive.

Additional Farmlands of Importance

This is land, in addition to prime farmland, that is of importance for the production of food, fiber, and forage crops. Generally additional farmland of importance includes land that is nearly prime farmland and that economically produces high yields of crops when treated and managed according to acceptable farming methods. These lands have steeper slopes or are wetter than prime farmland. Some may produce as high a yield as prime farmland if conditions are favorable.

Decision makers should be aware of the importance of preserving prime farmland for the production of food, feed, etc. Actions that put high quality farmland in irreversible uses should be initiated only if these actions are clearly in the public interest.

It should be emphasized that prime farmland is one of the most important resources of the area, state and nation. This quality land can be farmed continuously or nearly continuously without degrading the environment. It will produce the most food, feed, etc., with the least amount of energy used. It responds well to fertilizer and other chemical applications with little loss of residues by leaching or erosion. Prime farmland is most responsive to management and requires the least investment for maintaining productivity. Every effort should be taken to preserve the farmland in the West Woods/Skiff Mountain area.

EROSION AND SEDIMENT CONTROL

All of the soils in the West Woods-Skiff Mountain area are erodible. In the interests of protecting water quality, it is very important that all future development in the watershed implement plans for effective erosion and sediment control. These plans are particularly critical in streambelt areas (see discussion in Section IV-C of this report). Erosion and sediment control practices are described in the "Erosion and Sediment Control Handbrook--Connecticut (USDA Soil Conservation Service, 1976). Additional assistance in the preparation and review of erosion and sediment control plans is available from the Litchfield County Conservation District.

IN CONCLUSION

Many of the soils in the West Woods-Skiff Mountain area present severe limitations for residential development due to shallowness to bedrock, steep slopes, wetness, and hardpan layers. Poorly planned development on these soils can have a significant adverse impact on surface and ground water quality. Hence, future

land use decisions should take into careful consideration the limiting factors of various soil types and plan accordingly. It should be noted that the general soils map included in this report does not replace the need for more detailed information concerning individual soil mapping units when site specific information is required.

E. Fisheries and Surface Water Resources

As shown in Figure 1, there are a considerable number of streams and ponds located within the West Woods-Skiff Mountain area. Most of these waters exist in a natural condition, as development in the subject area is very light.

According to USGS topographic mapping, there are twelve major ponds in the West Woods-Skiff Mountain Area and nine major streams. These water resources include:

Mill Brook Watershed
Hatch Pond (22 acres)
Ford Pond (26 acres)
Bog Meadow Pond (23 acres)
Eastman Pond (3 acres)
Unnamed Pond (9 acres)
Mill Brook
Beebe Brook
Bog Meadow Brook

Guinea Brook Watershed
Guinea Brook

Skiff Mountain Watershed
Stony Brook
Stewart Hollow Brook
North Kent Brook

Macedonia Brook Watershed
Peck Pond (25 acres)
Hilltop Pond (35 acres)
Jacks Brook Pond (8 acres)
Fuller Pond (40 acres)
Richards Pond (5 acres)
Blatz Pond (3 acres)
Case Pond (2 acres)
Macedonia Brook
Pond Mountain Brook

1. FISHERIES

The streams flowing within the West Woods-Skiff Mountain area are small and have good water quality. Most of the streams have steep gradients, with gravel-rubble substrates. Their waters would likely be cold and oxygen saturated throughout the year. Species of fish that would be commonly found in these streams include native brook trout, blacknose dace, longnose dace, and tessellated darter. Wild brown trout, creek club and fall fish may also be present. The section of Macedonia Brook, located within Macedonia Brook State Park, is the only stream section in the area that is stocked with trout by the Connecticut Department of Environmental Protection. Guinea Brook has importance to the trout fishery of the Housatonic River since the mouth of the brook provides a micro-habitat of cool water for stocked trout when river water temperatures become excessive.

Most of the ponds lying within the West Woods-Skiff Mountain area are generally shallow and would be inhabited by such warm water species as large-mouth bass, chain pickerel, yellow perch, brown bullhead, golden shiners, blue-gill sunfish and common sunfish. Hilltop and Bog Ponds may be so hallow that natural summer and winter kills of fish may occasionally occur from oxygen

depletion. Golden shiners and brown bullheads, which are tolerant of low oxygen conditions, may be the only species present in these very shallow ponds. Eastman and Fullers Ponds are probably sufficiently deep, in relation to their surface area, to contain cold water throughout the year. As a result, these two ponds should be capable of supporting trout, as well as warm water species.

With the exception of the stocked, State Park section of Macedonia Brook, recreational fishing in the area is limited. Although the other streams may be inhabited by wild trout, the streams are small and flow through private properties, where fishing may be restricted. Ponds in the area are either located on private land or in public nature preserves where fishing is prohibited. As a result, fisheries resources within the West Woods-Skiff Mountain area are generally underutilized.

The streams and ponds within the subject area may receive some loads of silt from adjacent dirt roads or from winter sanding operations carried out on paved roads. Mill Brook may be enriched with nutrients entering from surrounding farm land. However, fisheries resources within the area are not presently being affected significantly by these non-point sources of pollution.

Streams and ponds in the West Woods/Skiff Mountain area would be best protected from the effects of future development if contiguous 25 foot bands (minimum) of natural vegetation were left intact. Settling basins to capture silt from roads and new developments should be installed where needed and regularly maintained.

2. EUTROPHICATION AND POND MANAGEMENT ALTERNATIVES

Eutrophication is a natural aging process through which a waterbody gradually increases in fertility and biological productivity, and fills in with accumulations of organic deposits. As eutrophication proceeds, algae blooms increase in both intensity and duration, and aquatic plant growth becomes more prolific. The pond becomes shallower and the deep, cold waters are lost. During the latter stages of this process, the waterbody becomes a boggy or marshy wetland.

The pond characteristics directly associated with eutrophication are nuisance algae blooms, extensive beds of aquatic weeds, reduced depth and the loss of cold water. These characteristics may interfere with a pond's desired recreational uses.

Under natural conditions the eutrophication process usually advances very slowly over thousands of years. The process can be accelerated by activities of man which increase nutrient and sediment inputs to a waterbody.

In general there are three accepted stages of eutrophication which are defined as follows:

a. Oligotrophic - early stages of the process, very infertile, low biological productivity, high transparency, usually highly oxygenated and relatively deep with little accumulation of organic sediments on the bottom.

b. Mesotrophic - a mid-range between the two extremes of oligotrophic and eutrophic.

c. Eutrophic - late stages of the process, very fertile (high in plant nutrients such as nitrogen and phosphorus), high in biological productivity, low in transparency, bottom waters usually show reduced levels of dissolved oxygen and usually shallow with an abundance of organic matter on the bottom.

Analysis of water bodies throughout the State has shown that the majority of shallow, artificial impoundments are eutrophic. It is generally accepted that residential development within a pond watershed accelerates the eutrophication process, leading to further deterioration in water quality.

Phosphorus has been identified as the growth limiting nutrient in the majority of Connecticut lakes and ponds. The term "limiting nutrient" refers to the nutrient which is in the shortest supply relative to growth requirements. In general, algae and macrophytes will grow until the supply of some basic nutrient is depleted. Then any increase in that nutrient will result in a corresponding increase in biological productivity. Similarly, a reduction in that nutrient will reduce potential biological productivity. Enrichment of a pond with plant nutrients is thus the fundamental cause of eutrophication.

Residential land adjacent to a lake commonly poses several potential sources of lake water quality degradation. These are nutrient enrichment from runoff of fertilizers from lawns and gardens; nutrient enrichment from properly functioning septic systems, nutrient enrichment and pathogenic contamination from failing septic systems, and soil erosion. Each of these potential impacts is discussed briefly below.

Fertilizers - Lawns and gardens are generally very efficient at utilizing soil nutrients and preventing their loss through runoff and leaching. However, runoff and leaching of nutrients can occur if fertilizer applications exceed nutrient requirements, of if fertilizers are applied prior to storm events which cause significant runoff. These situations can be avoided if fertilizer applications are matched to soil requirments, and if fertilizer applications are timed to avoid periods of runoff.

Nutrient Enrichment from Properly Functioning Septic Systems - Septic systems, when functioning properly, provide for the sanitary breakdown of domestic wastewaters into simple chemical compounds, some of which are plant nutrients. Concern is focused on the plant nutrient phosphorus, since the availability of this nutrient controls algal growth in most Connecticut lakes.

Several attempts to quantify phosphorus loadings to lake waters in Connecticut have served to point out serious limitations in required information and knowledge. Many factors must be considered, including lake volume, the number and density of septic systems, the phosphorus loads to the septic systems, the ages of the septic systems, the proximity of the septic systems to the lake, the layouts of the leaching fields, the volume of soil which each leachate passes through, and the capacity of the soils to attenuate (immobilize) phosphorus. Although uncertainty is involved in determining each of these factors, the greatest uncertainty occurs in the determination of the most important factor - soil attenuation capacity. Laboratory studies have suggested finite and measurable attenuation capacities, but field studies in Connecticut have suggested that attenuation capacity could be enormous. Thus, it is not possible at the present time to accurately estimate phosphorus loadings from this source.

It should be noted that the phosphorus loads from septic systems which are contributing to enrichment of lake waters can be reduced by 30 to 40 percent by utilizing non-phosphate detergents.

Failing Septic Systems - Failing septic systems can not only result in the nutrient enrichment of a surface water body, but also in pathogenic contamination. As a result, every effort should be taken to ensure that septic systems are working properly in the subject area through a regular program of inspection and maintenance.

Soil Erosion - Soil erosion may be another important source of nutrients which can contribute to eutrophication in two ways. First, phosphorus and other plant nutrients are introduced into the pond by erosion; secondly, sediment particles are deposited in the pond, reducing the depth and thereby creating an environment more conducive to aquatic macrophyte growth.

When evaluating eutrophication it is also important to consider the cycling of nutrients between pond sediments and pond water. It is possible that nutrient recycle from the pond bottom is a significant source of phosphorus to the surface water. Nutrients within the sediments probably also serve to support rooted aquatic plant growth.

An abundance of aquatic weeds on a particular pond may interfere with desired recreational uses. As a result, interest may develop in controlling the weed population.

There are disadvantages to any weed control method. A few of the problems which may be encountered are:

1) Those macrophytes which are resistant to the control method employed may multiply due to a reduction in competitive pressures from other species.

2) If the weeds are removed, a loss of habitat, spawning areas, and a food source for fish and other aquatic organisms may be incurred.

3) After the weeds are removed, nutrients could be made available to algae and subsequently, "blooms" may occur.

The most common means of aquatic weed control are: winter drawdown, weed harvesting, chemical treatments, and drawdown and excavation. Each of these control methods is briefly described.

1) Winter drawdown

If the spillway in a pond has the capacity to effectively lower the water level, the pond may be drawndown in the fall to expose the sediments. Over the winter, the bottom freezes and destroys roots, vegetative parts and susceptible seeds. Winter drawdown will not kill algae. Winter drawdown should be coordinated with fisheries experts to prevent impacts on fish populations.

2) Weed harvesting

Weed harvesting entails the mechanical cutting of the weeds. Although the method provides immediate relief, it may have to be repeated at periodic intervals.

3) Chemical Treatment

The use of any algicide or herbicide within the waters of the State is governed by statute (Sec. 430 of Public Act 872) and permits are required from the Pesticide Compliance Unit of DEP.

Chemical treatments are generally only "cosmetic" and repeated applications may be necessary.

4) Drawdown and Excavation

Drawdown and excavation is sometimes employed to remove the substrate utilized by the plants for growth. The process increases water depth to levels where plants growing on the bottom will not receive enough light to survive.

This method has a relatively high capital outlay; however, the restorative effects are long termed.

If this method is considered, a feasibility study should be conducted to "map" pond sediments according to depth, composition, and underlying substances. Final disposal of excavated sediments should also be explored during the feasibility study.

3. WETLAND FUNCTIONS AND SIGNIFICANCE

Wetlands which are legally defined and regulated in accordance with Connecticut's "Inland Wetlands and Watercourse Act" (Sections 22a-36 through 22a-45 Connecticut General Statutes) are presented in Figure 3. To date these wetlands have not been disturbed significantly.

Scientific research has demonstrated that wetlands play a vital role in regulating the timing of transport of phosphorus to downstream waters. During the spring and summer biological growth period, wetlands remove significant amounts of phosphorus from overlying waters and effectively withhold that phosphorus from transport downstream. Mechanisms by which wetlands retain phosphorus include physical entrapment of particulate phosphorus, chemical sorption by organic matter and soil particles, uptake by aquatic plants and attached algae, and utilization by bacteria and other microorganisms. During the fall and winter, wetlands release phosphorus as decomposition of wetland vegetation takes place. Transport of this phosphorus to downstream waters subsequently occurs at a time of the year when the phosphorus is least likely to contribute to nuisance algae blooms and weed growth.

Thus, although little phosphorus is permanently withheld by wetlands on an annual basis, the "spring and summer storage/fall and winter release" pattern of phosphorus flux through a wetland serves to minimize summer algae blooms and weed problems in downstream waters.

The perpetuation of a wetland's phosphorus regulatory function involves, quite simply, maintaining the wetland in a natural state. Alteration or elimination of the wetland reduces or eliminates the effectiveness of this regulatory role and contributes to a worsening of the trophic conditions in downstream waters.

A second important function of wetlands relating to water quality of downstream lakes is the control of flooding and erosion. Wetlands retain water during periods of high runoff and gradually release water at moderate rates of flow. This flow regulation reduces flooding and erosion which could contribute sediment and phosphorus to lakes downstream. Alteration or elimination of wetlands would impair this function resulting in an increase of sediment and phosphorus loads to downstream lakes.

It is recommended that the Kent and Sharon Inland Wetlands Agencies utilize, to the extent possible, the authorities of Connecticut's Inland Wetlands and Watercourses Act (Sections 22a-36 through 22a-45 Connecticut General Statutes) to maintain the wetlands in the watershed in their natural states. Specifically, in granting, denying, or limiting permits for regulated activities in legally defined wetlands, functions which enhance the area's water quality should be given due consideration. This would appropriately take place during the process of weighing environmental impacts of proposed actions, and weighing irreversible and irretrievable commitments of resources involved in proposed actions.

Approximately ten percent of the land in the study area consists of wetlands. Maintaining wetlands in their natural state will protect lake water quality by providing for continued regulation of seasonal phosphorus loads, and continued control of flooding which could cause erosion.

F. Vegetation

The vegetation dominating the West Woods-Skiff Mountain Area is typical of Connecticut's northern uplands-transitional hardwoods zone. According to Dowhan and Craig[1], dominant "transition hardwoods" of this region include northern red oak, basswood, white ash, and black birch. Included also are tree species of the northern hardwoods zone, such as sugar maple, beech, and yellow birch, as well as southern and midwestern species more characteristic of the central hardwoods zone, such as white oak, black oak, shagbark hickory, and bitternut hickory. White pine and hemlock are also frequent and locally dominant. The early phases of old-field vegetation development are dominated by white pine. Several northern shrub species such as hobblebush and mountain-winterberry, are near their southern range limits in the state here. A number of other northern bog and forest species reach their extreme southern range limits in the cooler habitats of this region, especially in black spruce bogs. Some rare plant species of the region are bog rosemary, marsh willow-herb, Canada violet, and stiff club-moss.

For the purposes of this report, the West Woods-Skiff Mountain area may be divided into seven major vegetation types. The geographic distribution of these types is presented in Figure 5. The composition and potential for management of the seven major vegetation types is discussed next.

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[1] Dowhan, J. J. and Craig, R. J., 1976, Rare and Endangered Species of Connecticut and Their Habitats; CT Geol. Nat. Hist. Survey Report Invest. #6.

1. GENERAL VEGETATION DESCRIPTIONS

a. Transition Mixed Hardwoods and Northern Hardwoods - For the purposes of this report, the transition mixed hardwood and northern hardwood vegetation types are mapped together. In many places the vegetation types merge together and are characterized by a mixture of the species present in each. The overstory in the mixed hardwood area is dominated by white oak, red oak, black oak, sugar maple, red maple, shagbark hickory, pignut hickory, black birch and basswood, while the northern hardwood areas are dominated by sugar maple, yellow birch, paper birch, American beech and white ash. The understory and ground cover vegetation varies widely within this mapping unit. Hardwood tree seedlings and saplings, including American chestnut, are widespread, along with many shrub species which include but are not limited to blue beech, witchhazel, hazelnut, mountain laurel, large leafed holly, flowering dogwood and ironwood. Ground cover is dominated by club moss, grasses, sedges and many species of ferns.

Many of the tree species which are present in the transition mixed hardwood and northern hardwood vegetation types have high commercial value for sawtimber and fuelwood. The condition of the trees is quite variable, as dictated by site conditions, past land use, and past vegetation management. Areas which are not designated as having major limitations (see Figure 5) have high forest product productivity potential which can be increased significantly through proper forest management. Trees in these areas will respond well to periodic thinnings aimed at removing the poorer quality trees. These thinnings will reduce competition between desirable species and result in a healthier, higher quality stand.

b. Softwoods/Hardwoods - Eastern white pine and eastern hemlock are the dominant tree species present in this vegetation type. Scattered throughout are sugar maple, black oak, white oak, red maple, black cherry, American beech, black birch and yellow birch. Eastern white pine seedlings, hemlock seedlings, moosewood, low bush blueberry, huckleberry and mountain laurel are the most abundant vegetation forms in the understory. Ground cover is scarce throughout much of this area. Where it is present, club moss, grasses, sedges and christmas fern dominate. The tree species present in this area do have commercial value. However, because of poor growth conditions, poor access and poor operability (discussed in "limitations" below), this value may be low.

c. Plantation - Several softwood plantations are present within the watersheds. These plantations are usually made up of eastern white pine, red pine, white spruce or Norway spruce planted alone or in combinations on abandoned agricultural land. Understory vegetation, where it is present, consists of sugar maple seedlings, black cherry seedlings and moosewood. Ground cover vegetation is lacking except where poison ivy has become established near roadways and clearings. The trees in many of these plantations are extremely crowded and declining in health and vigor. At present, thinning in selected stands would be both feasible and beneficial. Reduction of the crowded conditions would help substantially to improve the health and stability of these trees.

d. Hardwood Swamp - Forested wetlands are common throughout the study area. Red maple is the dominant tree species along with scattered white ash and yellow birch. The understories throughout these areas vary widely in both species composition and diversity. High bush blueberry, spice-bush, sweet pepper bush and several species of viburnum are common throughout. Skunk cabbage, tussock sedge, cinnamon fern, sensitive fern and sphagnum moss are widespread as ground cover. The commercial utility of the trees in these areas must be evaluated on an individual wetland basis. Generally, tree growth potential is somewhat limited by the high water table and saturated soils which are present. Under these conditions, trees are shallow rooted and unable to become securely anchored, causing high potential for windthrow. These soil conditions also limit access and operability. Depending on the severity of these limitations, the feasibility of implementing timber management practices may be severely reduced or eliminated completely.

e. Open Swamps/Marshes/Wet Meadows/Bogs - Many non-forested wetland areas are present within the study area. The diversity of vegetation within and between individual wetlands is very great. Some of these areas are dominated by red maple seedlings, but the majority of these areas are dominated by shrub species including high bush blueberry, sweet pepper bush, swamp azalea, red alder, speckled alder, spirea, leather leaf, silky willow, buttonbush, large cranberry and arrowwood. The herbaceous vegetation which is common within these wetland areas includes many species of sedges, grasses and sphagnum moss, along with purple loose strife, swamp loose strife, cattail and phragmities.

f. Open Fields/Agricultural Land - Some of the most highly productive areas in the study area are occupied by open fields. These areas are at present being utilized as either cropland, mowed fields vegetated with grasses and assorted wild flower and weed species, and somewhat less productive pasture land vegetated primarily with grasses. Many of these areas have the potential to produce high quality timber if planted to softwoods or allowed to revert to woody vegetation.

g. Old Fields - The old field areas which are present are either open fields which were abandoned and allowed to revert to woody vegetation, or areas which do not have enough soil or soil moisture to support trees. Generally these old field areas are understocked with quality tree species. Those tree species which are present include eastern white pine, gray birch, quaking aspen, big tooth aspen, red maple, sugar maple, eastern red cedar and black oak. Included within this vegetation type are several small, poorly maintained apple orchards. Shrub species are abundant throughout, with gray stemmed dogwood, silky dogwood, arrowwood, high bush blueberry, multiflora rose, male berry and staghorn sumac being most common. Ground cover is dominated by grasses, goldenrod and milkweed. The commercial utility of the tree species found within this vegetation type is poor at the present time.

2. MAJOR LIMITATIONS TO FOREST MANAGEMENT

Areas which may present limitations to forest management are designated in Figure 5. These limitations may be divided into two major categories: those that restrict operability as related to forest management and those that restrict tree growth.

Operability as related to forest management may be limited by poor access, extremely steep slopes and/or severe rockiness. These obstacles may restrict or even preclude the actual implementation of forest management and harvest operations.

Included in the second type of limitation are excessively drained soils, shallow to bedrock soils, and wetland soils. These soils may limit or restrict tree growth, quality, and health to a point where the trees that are present have little or no commercial value.

It should be recognized that the limitations described above may not preclude forest management. However, proper planning and implementation is essential in these areas to insure an effective, efficient and environmentally sound operation.

3. MANAGEMENT CONSIDERATIONS

The Forestry Unit of the Department of Environmental Protection encourages all woodland owners to manage their forest lands. When properly prescribed and executed, forest management practices will increase the production of forest products, improve wildlife habitat and enhance the overall condition of the woodland with minimum negative environmental impact.

To reach a healthy and productive state, individual forest stands should be periodically evaluated to determine present and future management needs. A public service forester from the Department of Environmental Protection may be contacted at 379-0771 to provide basic advice and technical assistance in woodland management. These services are provided free of charge. Services of a more intensive nature are available from private consulting foresters.

Forest Management and Water Quality

Healthy woodlands provide a protective influence on water quality: they stabilize soils, reduce the impact of precipitation and runoff, and moderate the effects of adverse weather conditions. By so doing, woodlands help to reduce erosion, sedimentation, siltation and flooding. Research has shown that soil protected by the cover of litter and humus associated with woodland areas contributes little or no sediment to streams.

Improper cultivation and harvesting of timber for commercial purposes may,however,lower water quality in several ways: 1) Erosion, siltation and sedimentation caused by improperly located and improperly constructed access roads, skid trails, yarding areas and stream crossings; 2) Siltation and sedimentation caused by logging debris left in streams, interfering with natural flows; 3) Thermal pollution resulting from complete or partial harvesting of streambank vegetation, eliminating shade; 4) Chemical pollution caused by improper application of herbicides and insecticides (it should be noted however that in Connecticut the widespread use of chemicals in forest management is not prevalent and therefore does not constitute a great threat to water quality at this time); 5) Influx of nutrients caused by the application of fertilizer, soil conditioners and wetting agents (used in forest fire control). Research has determined that nutrient loss from normal silvicultural practices (i.e. practices involving the cultivation and harvesting of timber) does not, for the most part, result in significant deterioration of water quality.

Despite the potential adverse impacts to water quality, the harvesting of trees is a major and necessary tool used in forest land management. Adverse impacts to water quality can be minimized through good planning and responsible implementation.

A pamphlet entitled "Logging and Water Quality in Connecticut: A Practical Guide for Harvesting Forest Products and Protecting Water Quality" will soon be published and made available through the Department of Environmental Protection's Forestry Unit. A series of Best Management Practices (BMP's), which are recommendations designed to minimize the negative impact of silvicultural activities on water quality, are presented in this pamphlet.

A "BMP" as defined in the pamphlet is "a practical, economical and effective management or control practice which will reduce or prevent the generation of pollution".

Examples of recommended BMP's for preventing or reducing degradation of water quality resulting from silvicultural activities include:

Phase I. Planning the Job.

a. Locate all streams, wetlands and poorly drained soils (sensitive areas) on USGS topographic maps and/or county soils maps.

b. Plan preliminary locations of access roads, skid roads and yarding areas to avoid the sensitive areas. Locate potential stream crossings.

c. Plan for the best time of year to implement individual silvicultural activities. Sensitive areas that cannot be avoided should be planned for winter when the ground is frozen and more stable.

d. Plan Stream Management Zones which are aimed at protecting stream beds and stream banks.

Phase II. Implementing the Job.

a. Locate logging roads and skid trails so that the slopes of these roads do not exceed 10% except for short distances.

b. Locate yarding areas on well drained soils with a slight slope, avoiding drainage discharge directly into access roads or streams.

c. Locate Stream Management Zones and avoid equipment operation in these areas to the greatest extent possible.

d. Provide undisturbed buffer strips between streams and roads or yarding areas. The width of these buffer strips is generally between 30 and 100 feet but should depend on slope, soil erodability and the magnitude of road or yarding area drainage discharge.

e. Avoid, when possible, equipment operation on poorly drained soils, in swales and around or in stream channels.

f. Avoid complete clearing of vegetation in the Stream Management zone.

g. Avoid disturbing understory vegetation within 30 feet of a stream channel.

h. Avoid reducing overstory crown cover below 50% within 30 feet of stream channel.

i. Avoid felling trees in streams; if this occurs, remove debris as soon as possible.

j. Avoid stream crossings if possible; if not, consider building temporary bridges. Crossings should be made at right angles to the stream over stable rock or gravel bottoms, and should avoid steep or unstable banks.

Phase III. Completing the Job.

a. Install erosion control measures on access roads and primary skid trails, including properly placed waterbars and reconditioned cross drains, located at intervals which take into account road length, slope and common sense.

b. Remove all temporary bridges and culverts from streams.

c. Lime and seed specific critical areas, such as steeply sloped roads or problem areas.

d. Close roads to prevent continuing access.

Following these BMP's along with the use of common sense will help to avoid water quality degradation resulting from silvicultural operations.

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The implementation of the recommended BMP's will most likely be of a voluntary nature, aided through an accelerated educational program and perhaps an incentrive program, rather than through regulation. At this time, local regulation of forest product harvesting is contrary to State forestry policy.

Educational and incentive programs may be reinforced by the use of timber sale contracts which reflect the use of BMP's between landowners and loggers. A public or private professional forester can assist landowners in developing an effective timber sale contract. The posting of reasonable performance bonds by the logger may be necessary to help insure proper completion of the logging operation. Periodic on-site inspection may also be essential to see that the logging activities meet the contract terms. Proper education of the landowner and logger can be the key to successful use of BMP's in forest management.

Further guidelines to maintain water quality on managed woodlands may be found in the pamphlet "Timber Harvesting Guidelines" by the Wood Producer's Association of Connecticut. The principles set forth in this publication are aimed at protecting the forest ecosystem from thoughtless timber harvesting practices that may lower environmental quality in both the long and short run. Copies of this pamphlet are available from the Department of Environmental Protection's Forestry Unit and members of the Wood Producers' Association of Connecticut.

G. Wildlife

Long range land use planning is the only reasonable approach to protecting the integrity of the West Woods-Skiff Mountain area for wildlife. Short term parcel parcel impact review will be a salvage operation at best.

The 28 square miles encompassing the West Woods-Skiff Mountain area has some of the wildest land left relatively undeveloped in Connecticut. Large parcels are currently in ownership by organizations which will likely retain the land as open space (see Figure 6). The watersheds are relatively undamaged by current development and there is good dispersal of agricultural, forested and wetland habitat within the area.

The area is abundant with wildlife at the present time. In many cases species are far more abundant than 100 years ago. Deer are abundant enough in the area to cause agricultural problems and adversely affect their habitat. Beaver were reintroduced some 30 years ago and have been very active in the West Woods-Skiff Mountain area. The Canada goose has, in recent years, taken a sharp increase in population due to the abundance of suitable nesting sites and minimal harvest. The wild turkey, reintroduced only six years ago, has become common within the area. Few 28 square mile areas in Connecticut have as well balanced a habitat, and the consequent abundance of wildlife, as this area. With sound wildlife management, this area has even greater potential.

In order to preserve this wildlife heritage, and perhaps improve upon it, the following considerations should be incorporated into the planning process:

1. Public and conservation organization ownership of land should be encouraged where the wildlife value of the land is high.

2. Use of the Connecticut Agricultural Preservation Act should be encouraged where possible to ensure the retention of prime farmland and open space areas valuable to wildlife.

3. To retain the wildlife value of this area, development should be concentrated on the most suitable sites leaving the majority of the land undeveloped. Residential development on large lots (10+ acres) with homes close to existing roads or cluster development retaining a high acreage per unit ratio are the most compatible forms of development when considering wildlife values.

4. Wildlife management including the tools of hunting and trapping should be employed to control animal populations, especially where necessary to control damage to crops, protect wildlife habitat, and prevent wildlife disease.

5. Development proposals should include considerations for the impact of man on wildlife and wildlife on man. Management tools are available to minimize both types of impact. Vegetation planting, good forest management, and creating additional openings in the woods, can lessen the negative impact man has on wildlife when development takes place. Fencing, repellants, and controlled harvest of game species can reduce the negative impacts of wildlife on man without seriously impacting the wildlife populations.

6. Consideration should be given to restricting development in areas of high value to wildlife. Generally, the greater the density of development, the greater the conflict between wildlife and human populations. For example, assume beaver are inhabiting an inaccessable wetland. Residential development in the area would likely lead to conflicts between the human and beaver populations with the ultimate removal of the beaver. Subsequently, the extent of wetland habitat would be reduced and consequently its value to wildlife would diminish.

Three major types of habitat are present in the area and consideration should be given to their protection where possible. These areas include:

1. Wetland Corridors. Much wildlife activity takes place in streambelt areas. A streambelt ordinance as discussed in Section IV C of this report will help considerably in protecting this important habitat area. Streambelt corridors are shown in Figure 4 of this report. From a wildlife standpoint, crossing of wetlands by roads should be limited and constructed at elevations no lower than 3 feet above high flood and with special considerations if there is potential beaver activity in the area.

2. Open Fields. Important agricultural areas are shown in Figure 4. Although most agricultural areas benefit wildlife, some are more important than others. Secluded fields are very valuable to wildlife. Roadside areas, on the other hand, have lesser value. "Clean" farming is less valuable to wildlife than fields with stone walls and hedge rows. Grain, corn, alfalfa, and hay crops in small fields offer excellent habitat for wildlife.

3. Forested areas are another valuable type of habitat for wildlife. Woodlands are of most value when interspersed with open fields. Diversity of both age and species of flora is important for a diversity of wildlife. Good forestry practices, including small clearcuts are generally very compatible with the wildlife resources. Mast (nut) producing trees are good food sources and a few of these, such as the oaks, should remain after any forestry operation. A few den trees should also be exempted from culling during a forest cut operation.

H. Subsurface Sewage Disposal

Present zoning regulations in the West Woods-Skiff Mountain area permit subdivision of property with minimum one and two acre lots served by on-site sewage disposal and water supply facilities.

As indicated in preceeding sections of this report, most of the land within the West Woods-Skiff Mountain area is marginally suited for on-site sewage disposal due to one or more limiting characteristics such as shallow soil covers over bedrock, seasonally high ground water, poorly drained soils or severe slope conditions. The mountainous terrain of the area will undobtedly have a significant effect on reducing residential density in both the southern most land area located in Kent and the northern tract in Sharon identified as the Mill Brook Watershed. On the other hand, soil maps of the subject area do identify many small pockets of relatively well drained soils, the largest of which runs parallel to Route 41 in Sharon along the Mill Brook drainage basin. Location and identification of these well drained soils is essential if cluster zoning or installation of large community sewerage disposal systems is to be considered.

It is essential that careful consideration be given to land development and subsurface sewage disposal in order to minimize the impact on surface and ground waters. Much of the now vacant land has more than one limiting factor for sewage disposal and therefore, adequate soil testing must be performed in order to identify suitable leaching areas within proposed lot lines. In the mountainous areas, it cannot be assumed that a suitable leaching area will be available just on the basis of large lot size. A typical leaching area suitable for installation of leaching trenches based upon a seepage rate of 30 minutes per inch would occupy an area approximately 100 feet wide and 50 feet long. This would be sufficient in size to provide a primary and reserve leaching area in compliance with the Public Health Code. It should be recognized however, that although local zoning may require only one or two acre lots, soil, slope, and ledgerock conditions may dictate lot sizes significantly larger than minimum codes.

Planning and zoning based upon single lot subdivisions with on-site sewage and water supply systems is the most simplistic form of property development. Typically the prospective land developer attempts to maximize the number of acceptable lots to offset high development costs caused by expensive road construction. In the past, subdivisions have caused the creation of numerous lots with varying capacities for sewage disposal purposes. Once the design engineers lay out the proposed subdivision roads, an attempt is made to locate suitable building areas and locations for water supply wells and sewage disposal systems at set intervals along the roads. Individual subdivision lot development places the burden for operation and maintenance of water supply and sewage disposal systems directly on the property owner and requires little from the municipalities after septic system construction has been approved by the local health department.

The concept of cluster zoning with respect to sewage disposal may be desirable when favorable soil site conditions exist. Consider the development of a 90 acre parcel of which 10 acres contain deep deposits of well drained soil and the remaining 80 acres is marginally suited due to slope, ground water, and ledge rock. Single lot subdivision would probably locate seven or eight homes in the well drained soil and perhaps thirty or more in the remaining marginally suited areas. Costly road and storm drainage facilities would be required in order to develop 37 lots on the 90 acre parcel. Cluster zoning , on the other hand, would permit maximum development of the best suited areas and preserve much of the marginally suited property in its natural state. Small lot subdivisions (¼ acre lots) would be feasible in good soil areas providing a community water supply system is available.

Cluster development is desirable for developers because it restricts site construction to a limited area with good soil conditions and significantly reduces expensive road and storm drainage systems. Small "neighborhood" clusters utilize a small percentage of land which leaves the remaining acreage available for community ownership by cluster unit residents or dedication to municipal agencies as open space. Sewage disposal systems constructed individually for each residence provides many advantages and can result in a cluster development base almost identical to a conventional development except for reduced lot area.

Community subsurface sewage disposal systems collect wastes generated from individual residential or condominium buildings, provide primary treatment through the use of standard septic tanks and ultimately dispose the liquid effluent in one or more large sewage disposal systems. These subsurface sewage disposal

systems are similar to standard residential septic systems except for size. Use of community septic systems is desirable when limited areas of good soil are identified on large tracks of land to be developed. Use of community septic systems permit building construction on land unsuitable for sewage disposal purposes. Sewage may be collected through a gravity sewer system much like the municipal sewer systems and directed to one or more septic tanks located on the property. Liquid effluent from the septic tank is then directed to one or more subsurface sewage disposal systems specifically located in the more acceptable soil areas for ultimate disposal by conventional methods. Design of all community subsurface sewage disposal systems must be approved by both the State Department of Health Services and the Department of Environmental Protection and are subject to thorough reviews in order to assure long term effective operation. As a condition for approval to discharge, the DEP requires that municipal water pollution control agencies either secure from the developer necessary contractual agreements to provide for long term operation and maintenance of the community sewage disposal systems or be willing to assume the responsibility for routine maintenance and operation as a municipal sewage disposal system.

Development of properties with cluster zoning and/or community sewage disposal systems tends to concentrate residential development in a smaller area within the subject parcel. If these development concepts were incorporated in town planning and zoning regulations, some method of determining maximum development density per acre must be determined. Use of cluster zoning and community sewage disposal systems could be considered a developer's option with the provision that housing unit density does not exceed the number of individual dwelling units permitted by existing single lot subdivision regulations. Without this provision, cluster zoning might merely serve to provide a means to increase the density of development in a given area.

A major concern of this study was focused on the prevention of ground and surface water pollution by all aspects of property development including siltation and subsurface sewage disposal systems. A major effort should be made by both Kent and Sharon to assure well trained individuals are available to witness all soil testing and provide valuable feedback to town planning and zoning commissions prior to the approval of property development. Typically, local health department staff have provided these essential services and follow through with all property construction in order to assure compliance with Public Health Code regulations. Some towns have adopted more stringent health code regulations in an attempt to further reduce the chance of pollutions. The experience of the Department of Health has shown that strict enforcement of existing regulations produces more positive results than adoption of more stringent regulations without qualified personnel back-up. As a result, rather than adopting more stringent health regulations at this time, it would appear preferable to employ a competent health department staff to provide not only the day by day services required by local residents, but to serve as technical advisors to the planning, zoning, inland wetlands, and town engineering offices on all matters concerning property development and environmental protection. The additional expenses incurred by providing this professional service can be realized in the forthcoming years by precluding expansion of expensive municipal public sewerage systems to those areas of the town which were developed with little concern for sewage disposal and ground water protection. Hiring of well trained registered sanitarians to provide full time coverage for small communities is sometimes too expensive for municipalities. The formation of public health districts in compliance with State Statutes may relieve some of the financial burdens in providing full time coverage by well trained professional staff.

I. Landscape Evaluation

The aesthetic quality and high degree of apparent resource protection and utilization within the study area are the result of a number of factors including transportation, land ownership patterns, topography and economy.

Existing patterns of land use appear directly influenced by road locations in the various sections of the study area. Much of the area is inaccessible by normal vehicles and is therefore developed or used to a minimal degree.

The major lanes of transportation are generally found on the fringe of the study area. These roads have opened many sections to agricultural use in the foreground with wooded, undeveloped ridges as the back drop. This creates a rural feeling where man and nature compatibly coexist. The hand of man is quite evident in these parts of the study area and are found along Rt. 41 in the Mill Brook Watershed, along Rt. 4 in the Guinea Brook Watershed, segments of the Macedonia Brook Watershed along Skiff Mountain Road, and in the northern section of the Mill Brook Watershed along the northern side of Rt. 4.

Generally the balance of the study area is heavily wooded and the majority of the scenic views are found in the farm land areas.

Due to large acreages held in private lands, the area has experienced little recent development. This is generally the case in Sharon where there are more than 300 approved building lots which have been sold but not yet built upon. Since the study area is difficult to penetrate, and the topography and soils present difficulties to major development, it is likely that future development will be limited. This, however, will depend upon market conditions.

A review of soils mapping in the area indicates there are pockets of developable land, many of which are found along the existing road system. The majority of the interior roads are undeveloped and it appears likely that frontage development is more likely to occur than interior lot development. To allow this to occur on all roads within the study are would ultimately provide less new housing and permanently alter the rural character of the area.

Based upon a landscape evaluation of the West Woods-Skiff Mountain Area, the following recommendations are offered for considerations:

1. An in-depth follow-up study centering on citizen involvement should be done to identify additional sensitive or scenic lands within the study area which should be protected. These areas should be mapped and added to overall open space plans for the towns of Sharon and Kent.

2. Incentives should be considered in the subdivision regulations to encourage creative development which will work to protect farmland, the surface and groundwaters, streambelts, and the scenic views in the study area. These might include:

    a. large lot developments of 10 or more acres per lot, open space subdivisions, and the various forms of cluster development including those allowing higher densities where the land base permits.

b. limitations on frontage development in favor of interior lot development which will retain the scenic character of the area.

c. protection of farmland from development.

d. limitation on hillside and ridgetop development which could endanger water quality through erosion and sedimentation and visually mar scenic vistas in the study area.

e. addition of regulations to encourage energy efficient development, allow small package sewage treatment plants and community wells, provide for erosion and sediment control and lakes management to protect the town's surface waters.

3. It is recommended that a citizen initiative be undertaken to work with and encourage the conservation commissions and planning and zoning commissions to develop the recommended plans and regulations. This citizen initiative could serve as a land trust and act as a receptacle to hold and manage the town's open space lands if so desired.

4. Presently, much of the study area is not being actively managed for forest products or wildlife management. Such management can protect and improve the resource base for future use.

J. Cultural Resources

A study of the area under consideration, undertaken by staff members and volunteers associated with the American Indian Archaeological Institute, has identified numerous historic sites which would be threatened if intensive residential development was initiated. In addition, previous archaeological studies during 1978 and 1979 have located several prehistoric sites along the kames and kame terraces associated with the Housatonic River. While these sites are outside of the immediate project area, their presence indicates that the four watersheds may have been used by prehistoric populations for thousands of years.

Geomorphological studies of this region, including the pioneering efforts of George Kelley (Late Pleistocene and Recent Geology of the Housatonic River Region in Northwestern Connecticut, 1975), demonstrate that glacial ice had disappeared from the region by 13,000 B.P. By 11,000-10,000 B.P. human populations had begun to inhabit the Housatonic Valley and its tributaries, including the Shepaug. During the subsequent millenia these populations would have used the landscape within upland zones as well as along the valley floor. One recurring (though not constant) focus of prehistoric settlement in the uplands was large wetlands and shallow ponds. Elsewhere in Litchfield County, Robbins Swamp, for example, such features are surrounded by numerous prehistoric archaeological sites, some of which are quite large, suggesting the presence of permanent settlements.

While no known prehistoric sites have been located within the project area, the presence of several large wetland formations (including Pine Swamp) suggests that such resources are probably present. The Macedonia Brook and Mill Brook Watersheds could contain numerous campsites of varying ages. Since the landscape of most of the area is upland and has been stable since 13,000 B.P., any

archaeological record in this area is quite fragile, lying on or just below the modern ground surface. Thus these archaeological resources, if present, could easily be destroyed or disturbed by any construction activities.

Each of the four watersheds also contain historic sites (eighteenth and nineteenth centuries A.D.) whose location and potential were studied briefly. On the basis of evidence isolated from the 1874 F.W. Beers' County Atlas of Litchfield, Connecticut, Helene Pennington has shown that the area contained several clusters of structures during the historic period. Among the most notable are those near the Skiff Mountain Cemetery (Macedonia Brook Watershed), South Ellsworth in the southeastern corner of the Guinea Brook Watershed, one group east of Mitcheltown at the outlet of Ford Pond (Mill Brook Watershed), and a fourth cluster, east and south of Amenia Union (Mill Brook Watershed).

Some of these clusters were apparently agricultural while others were centers for a variety of hydro-powered milling facilities. Isolated historic agricultural farmsteads also existed in each watershed, located mainly along extant roadways, separated from one another by varying distances. The majority of these resources are now archaeological sites; some exist as standing structures, abandoned or inhabited. While the integrity of none of these sites has been examined, they are highly visible as well as fragile.

In addition to these more obvious historic archaeological resources, each of the watersheds also contain less obvious sites of the eighteenth and nineteenth century. Much of this area was used for more than 100 years as a source of hardwoods for the region's charcoal industry. The landscape is covered with signs of this activity including numerous pits and other features where the materials were processed. The final product was used by the furnaces in the Towns of Kent, Sharon, and Salisbury.

While few field studies have been conducted in the West Woods-Skiff Mountain area, previous investigations elsewhere and archival records suggest that numerous archaeological resources may exist. These sites are of varying ages associated with both the prehistoric and historic eras and will be subjected to varying adverse effects if the area is subjected to intensive residential development.

Since much of that projected development would be initiated and financed entirely within the private sphere, extant federal or state preservation law does not offer such resources any viable protection. Further, the contemporary political climate indicates strongly that local preservation statutes--which would intensify governmental regulations--would be met with skepticism and defeat. Currently the American Indian Archaeological Institute is attempting to respond to this problem through educational programs as well as the development of an archaeological conservancy. Nevertheless local officials and commissioners should understand that Litchfield County's landscape is covered with hundereds of archaeological resources whose age varies between 10,000 B.P. and the turn of the twentieth century. The fabric of such cultural resources is fragile and easily destroyed, resulting in the loss of non-renewable records.

IV. LAND USE AND PLANNING CONSIDERATIONS

A. Land Use Plans and Patterns

A review of the Kent and Sharon Plans of Development indicate the following which relate to the West Woods-Skiff Mountain area.

The Sharon Plan of Development (1970) does not classify the majority of the West Woods area, however both Ellsworth and Amenia Union are designated as areas of "secondary development' or sub-centers of residential development. Also indicated is a possible 66 acre reservoir area southwest of Bog Meadow Pond to serve Sharon Center.

In terms of transportation, the Plan maintains that growth will continue as it has in the past with an expansion of the existing development patterns. The Plan, without designating specific roads, notes the following, "It has been suggested that several of the rural roads in Sharon merit consideration, due to their unique scenic or historic interest, as 'preserved woodland trails'. This classification of town road would provide for the protection and preservation of these roads to allow certain areas of town to retain their natural beauty. The roads so identified would continue under this classification until the development of a proven need by virtue of increased traffic load, the necessity for access or connection to other travelled roads, the need to better serve a desirable new land use, etc".

The Kent Plan of Development (1975) classifies the Skiff Mountain area as a "low" density residential area. It also indicates that streambelt areas, as recommended by the Soil Conservation Service, should be protected. Areas deserving complete protection include Pond Mountain Land Trust and a slightly enlarged Macedonia Brook State Park.

The Kent Plan of Development presents a comprehensive discussion of soil conditions in the town and their impact on development. Soils limitations in the area include: rock outcrops or shallow to bedrock areas, steep slopes, soils saturated with water within three feet of the surface, and hardpan soils.

The report recommends that streambelts should not be changed or disturbed if at all possible, except where man can improve the quality of the waterway. Development along streambelts should be carefully controlled so that the water system is not contaminated or changed from its natural course.

Skiff Mountain Road has been identified as a road which, due to its location between Kent Girls School and Kent Center, future land use plans should take into account as possibly needing road improvements.

A review of the advisory State Plan of Conservation and Development 1979-1982 indicates that the study area is designated "Existing Preserved Open Space", "Preservation", "Conservation" and "Rural". Each of these designations call for protection of critical natural resources and the development of land only at a density which can support on-site wells and septic systems.

The Preservation and Conservation Study prepared by the Northwestern Connecticut Regional Planning Agency and Rhode Island School of Design, likewise recognizes the area for its extensive scenic road network.

An analysis of building rates in the study area was performed utilizing the United States Geological Survey maps and ground investigations. Building activity was divided into three categories: pre 1956, 1956-1969, and 1969 to present. These categories were chosen because the USGS maps were prepared in 1956 and photorevision is shown on the 1969 map as a purple overlay so new construction is easy to identify. The 1969 - present building activity was taken from two sources, arial photos flow in 1975 and ground checks of the entire study area by members of the West Woods-Skiff Mountain Association. The figures on building activity are as follows:

Year	No. of buildings
Pre 1956	287
1956-1969	+95
1969-present (6/81)	+115
Total	497
Demolitions	8
Adjusted Total	489

It is evident from the above figures that the long term trend is for increased building activity in the study area. Since 1956 the number of buildings has increased by 73%. Of that total, 45% occurred between 1956 and 1969 (13 years) while 55% occurred during the 12 year period from 1969.

An analysis of land ownership in the West Woods-Skiff Mountain area shows that there are 456 parcels partially or wholly within the study area (see Figure 6). A breakdown of the parcels by area reveals the following:

Parcel Size	No. of Parcels	Percent of Total
0-2 acres	62	14
2-5	110	24
5-10	64	14
10-25	66	14
25-50	65	14
50-100	48	11
100+	41	9
TOTAL	456	100

The above chart reveals two things of importance. One, there are a significant number of 'small' lots (172 of 456 are under five acres in size). A second finding is that there is a large amount of land in tracts of fifty acres or more. Although the total number of tracts may not appear great (only 20% of the total), the large size of these parcels together comprise approximately 7,700 acres. This indicates that the development pattern of the study area has not yet been set and that the future form of the study area can still be determined. It should be noted that three large tracts are presently free from development pressure. These include the Sharon Audubon Center, the Pond Mountain Trust property, and Macedonia State Park (see Figure 6). Other major land owners in the study area include the Kent Girls School and Northeast Utilities.

An analysis of land development patterns in 1956, 1969, and 1975 (based upon USGS mapping) indicates that growth in Sharon has followed historic patterns and occurred predominantly along Routes 4, 41 and near Sharon Center. Growth in the core of the Sharon section of the West Woods-Skiff Mountain area has been light and scattered.

The pattern of development in Kent has been somewhat different than in Sharon. The development of the Kent Girls School, and the residential development which may be associated with the school, has produced growth atypical to the historic growth patterns of development along the Housatonic River and more recently in the Kent Hollow section of town. Future growth in the West Woods-Skiff Mountain section of Kent may be dependent on the future of the Kent Girls School.

Population projections by the State Office of Policy and Management indicate that through the year 2000, Sharon's population will increase roughly 1% every 5 years while in Kent the population growth will average 3-5% every five years for the same time period. Sharon's projected growth is less than the Northwest region's projected average while Kent's is slightly more.

B. Road and Traffic Conditions

1. STATE ROADS

The West Woods-Skiff Mountain area is served by three numbered state highways. These are Routes 341, 41, and 4. Only Route 4 is classified as a secondary highway by the State. Within the study area itself, there are 3.08 miles of Route 41 and 3.42 miles of Route 4. None of Route 341 traverses the study area; however, to gain access from the south one must use 341.

A. Condition and Maintenance

In 1979 the Northwestern Connecticut Regional Planning Agency conducted a highway maintenance study and found that on a scale of 1 to 10 (1 = best) the surface condition on these highways were: Route 4 = 6; Route 41 = 4; Route 341 = 7. Because of the generally deteriorating conditions of highways statewide, repairs to these roads are not high on the region's priority list. Regional priorities, out of 45 highway segments, are Route 4 = 18; Route 41 = 29; Route 341 = 35. In 1980, ConnDOT under a mandate from the Legislature, conducted its own survey of road conditions. Route 4 was rated fair to good, Route 41 - poor, and Route 341 - fair to good. The State study included all maintenance factors and not just surface conditions as did the NWCRPA study. The State has no plans for repair or reconstruction of any of these highways.

B. Traffic and Accident Data

State traffic data indicates the following:

Road Segment	Average Daily Traffic (ADT)	Capacity Vehicles/Hour
Rt. 4 - Sharon to Cornwall Bridge	1500	1760
Rt. 41 - Sharon to State line	1100	1520
Rt. 341 - Kent to State line	1100	2000

State accident summaries from 1969 through 1977 indicate that there were 79 accidents reported on Route 4, 25 on Route 41, and 31 on Route 341. Reportable accidents are those involving property damage or personal injury. The State does not consider a place a high frequency accident location unless within a three year period, there have been 15 accidents at that spot or short road section (generally less than 1/4 mile). There are no present plans for any safety improvements of these highways.

2. TOWN ROADS

Within the study area are 41.9 miles of local, town maintained roads. In Kent, there are 3.94 miles of unimproved roads and 7.9 miles of improved roads. In Sharon there are 16.24 miles of unimproved roads and 13.82 miles of improved roads. The 'main' north-south roads are Macedonia Road (gravel), Keeler Road (gravel), and Skiff Mountain Road (paved) in Kent and West Woods Road (gravel), Keeler Road (gravel), Skiff Mountain Road (paved), and Modley Road (gravel)in Sharon. The main east-west roads are Caray Hill Road (paved) and West Woods Road (gravel) in Sharon.

A. Condition and Maintenance

The chief maintenance problem of these town maintained roads is lack of funds. Given funding available they are well maintained; however, State funds have not increased in recent years while costs have increased greatly. This is especially the case with road oil. Towns are only oiling their improved roads one-third to one-fourth as often as formerly; as a result town roads are continuing to deteriorate as are the State roads. It should be noted that the present Town Aid Highway formula works to the advantage of the towns with significant dirt road mileage. Towns receive $1500 per mile for the first 32 miles of improved road and nothing for additional mileage. However, they also receive about $1100 per mile for an unlimited amount of dirt roads. (This amount varies from year to year in that it is based on a fixed dollar amount divided by total statewide dirt road mileage.) Although State officials would like to see the towns pave all their dirt roads, there is actually a financial disincentive for towns to do so. In fact, there is a financial incentive for towns to allow paved roads to revert to dirt roads and to have developers leave subdivision roads dirt.

B. Traffic and Accident Data

Although there are no official records of traffic counts in the study area, it can be expected that traffic would be quite light. Just about the whole area can be considered low or very low density residential. Using an estimated traffic generation of 10 daily trips per residence, most all of the roads in the area would have a traffic count of under 300 ADT. Only on Skiff Mountain Road in Kent, near the Kent School for Girls might higher counts be realized. Traffic generation statistics for secondary boarding schools do not exist, however, high schools generate about 1.2 trips per student per day. It can be expected then that a boarding school of 200 students would generate considerably less than 240 trips. This traffic, combined with residential traffic would result in a count on Skiff Mountain Road well below 500 ADT. Traffic volumes up to 500 ADT on oiled gravel roads are considered quite adequate. This type of road would have a maximum speed of 30 MPH and typically in low density residential areas there would be 10 curb

cuts (e.g. driveways) per mile per lane. Although the State recommends oiled surfaces for all roads under 500 ADT, others believe that gravel roads are quite serviceable in very low density residential areas generating under 50 ADT with 5 curb cuts per mile per lane. Gravel roads are usually rated for a maximum speed of 25 MPH. All the gravel roads in the study area appear to have fewer than 5 curb cuts per mile per lane, however, some of the longer dirt roads could be expected to have traffic somewhat in excess of 50 ADT. For example, West Woods Road probably has traffic well in excess of 50 ADT.

Accident records for the study area from 1972-1977 indicate 10 accidents on town roads in Kent, and 25 in Sharon. The most accident prone roads were Skiff Mountain Road (6) in Kent, and Knibloe Hill Road (7), and West Woods Road (6) in Sharon.

3. SCENIC ROADS/DIRT ROADS

Although several states have scenic road policies and enabling legislation that allows highway departments certain latitude in deviating from normal road standards in order to preserve scenic features and character, Connecticut at present has no such policy. However, identification of scenic roads throughout the State has been encouraged by planners from the Connecticut Department of Transportation. The Northwestern Connecticut Regional Planning Agency has identified many roads with high scenic potential in the planning region. In the West Woods-Skiff Mountain area, the following have been identified:

North Kent Road - Kent
Skiff Mountain Road - Kent - between Fuller Mountain Road and West Woods Road
Boland Road - Sharon
West Woods Road - Sharon - between Boland Road and Skiff Mountain Road
Sharon Mountain Road - Sharon
Route 41 - Sharon - between State line and Mitcheltown Road

Some people do not advocate the identification and 'posting' of a scenic road, believing that sightseers will flock to it, thereby ruining its scenic character. Whether or not this is the case, there are a number of steps a town can take to protect its scenic roads. These include:

- ordinances controlling driveway access to the road
- design standards for new roads to limit overbuilding of local roads, and to protect the dedicated right-of-way
- reduction or elimination of through truck traffic
- parking area limitations, especially on-street parking
- procedures for preserving dirt roads including special road surface treatments
- replacement of off-premise outdoor advertising with directional signs such as implemented in Vermont
- protection of tall trees from cutting by utility and highway maintenance crews
- regulating building height
- setback regulations for fences and structures from the roads
- reduce traffic demand by zoning for low density development
- restricting the moving or removal of stone walls adjacent to the road

Closely akin to the scenic road issue is the dirt road issue. Many rural citizens feel dirt roads add to the aesthetics of the region and seek means to "keep the dirt roads dirt". Most of the above measures for protecting scenic roads would apply here. There is also the aforementioned financial incentive in the Town Aid dirt road program to keep dirt roads dirt. Also adoption of a scenic road policy by the State would help. A group called: Residents for Rural Roads, 375 Sperry Road, Bethany has been working toward adoption of a State scenic road act.

There are also environmental pros and cons to dirt roads. Air quality interests advocate paving dirt roads as a means of reducing particulate pollution. Also smoother roads reduce fuel consumption and, as a result, emissions. Colorado requires that roads with an ADT greater than 165 be paved. On the other hand, some water quality advocates believe that the stormwater filtration effect of a dirt road is beneficial, whereas runoff from pavement is harmful.

4. CONCLUSIONS

The existing State and local road system in the West Woods-Skiff Mountain area is more than adequate to meet present and future needs. Present traffic is well below capacity and there are no serious safety problems. There is no need to pave any of the existing gravel roads although West Woods Road does carry traffic considerably in excess of the maximum for dirt roads as recommended by some traffic authorities.

Maintenance, especially in times of fiscal restraint by all levels of government is and will always be a problem. The increasing cost of petroleum based surfacing products only aggravates the situation. This factor and the influence of the Town Aid dirt road fund may well lead to more dirt roads in the future or at least curtail any impetus to pave the existing ones. Therefore, towns should be sure to keep abreast of dirt road maintenance practices and keep the dirt roads well maintained so that a need to pave will not exist.

The towns of Kent and Sharon should seriously consider taking steps to preserve the scenic roads in the West Woods-Skiff Mountain area. State scenic road legislation should also be supported by individuals, towns, and rural road advocates.

C. Streambelt Planning

The quality of the environment in the West Woods-Skiff Mountain area is to a great degree linked to the streams and their associated lands. These important areas may be referred to as "streambelt environmental corridors". In these corridors of land and water are vital natural resources that deserve priority consideration with respect to land use planning and management.

For most of the area, there is still time to conserve and develop the natural resources of the streambelt corridors. For the most part, urban development has not encroached to the point where few streambelt possibilities exist. Evidence of irretrievable destruction of streambelts can be found, however, in other areas. Population growth and resultant urbanization will greatly increase the hazard of uncontrolled development within streambelts if action to protect them is postponed. The following information on streambelt planning and implementation has been prepared by the U.S.D.A. Soil Conservation Service.

The components of streambelts are:

1. Critical components

   a. The watercourse of a defined perennial stream including banks, bed, and water.
   b. Lands subject to stream overflow.
   c. Associated wetlands.
   d. Shorelines of lakes and ponds associated with the stream.
   e. Areas in proximity of streams where certain developments or land uses probably would have adverse environmental effects, i.e., pollution and health hazards, erosion and sedimentation, destruction of ecological systems.

2. Optional components

   a. Contiguous lands with special environmental values, i.e., wildlife habitat, esthetic, public recreation, scenic, historic, etc.
   b. Potential water development sites of public significance.
   c. Other areas necessary as links to form a continuous streambelt system.

The objective of a streambelt system is the identification, development, and management of a network of environmental corridors according to standards that curtail pollution and siltation, reduce hazards of flood loss, provide quality recreation areas, promote scenic beauty, and protect important ecosystems. Streambelts are intended to serve the needs of people for open space.

Planning a Streambelt System

In the interest of public health, safety and welfare, a streambelt system is intended to conserve natural resources of vital significance, permitting and encouraging the wise use of these resources. In advancing these principles,

the specific intents are:

1. To promote such development or land uses that would not have probable adverse environmental effects.
2. To promote the health, safety, and welfare of residents and property owners near streams and in areas subject to flooding, and to prevent further occupancy in floodprone areas.
3. To maintain natural drainage courses sufficient to carry abnormal flows of storm water in periods of heavy precipitation and prevent the future need of excessive public expenditures for water disposal, and to reduce the need for costly flood prevention measures by retention of floodplains and floodprone areas in open space.
4. To maintain a framework of environmental corridors of high quality for public access with close proximity to neighborhood and population centers.
5. To help stabilize stream flow.
6. To protect water quality.
7. To retain sites for beneficial water uses such as flood control, water supply, wildlife habitat, and recreation.
8. To protect areas of importance to the preservation of significant ecological systems.
9. To maintain and encourage the improvement of environmental qualities including beauty, recreational opportunity, plant and animal life, scenic and other natural values.
10. To preserve areas of unique, scientific, or historic interest and to retain areas with special significance for scientific study, ecological research, and conservation or nature education.
11. To retain contrast in the landscape and provide buffer zones between incompatible land uses.
12. To protect and improve fish and wildlife habitat.
13. To help protect groundwater areas that are important to water supply.

Land Use Determinations

1. Land Uses Compatible with Soil Characteristics

   a. In all areas of the streambelt:

      (1) Wildlife preserves, preservation of scenic, historic, natural, and scientific areas and nature study.
      (2) Forestry and wildlife habitat.

   b. In addition to those stated in 'a' above, other uses and operations are compatible in certain areas as follows:

      (1) Natural soil groups* A-1a, A-1b, A-1d, A-1e, A-2, B-1a, B-1b, B-1c, B-2, C-1a, C-1b, C-1c, C-2, E-1 and E-2.

      Agriculture activities including plant nurseries, cropland, hayland and livestock pasture (with livestock watering devices) provided erosion and pollution are controlled.

*Refer to: Know Your Land - Natural Soil Groups for Connecticut, USDA Soil Conservation Service and Connecticut Cooperative Extension Service, No. 71-56. This publication is available at the Litchfield County Conservation District (567-8288).

Outdoor recreation uses such as parks, playgrounds, campsites, golf courses, hunting areas and trails.

Uses that maintain permanent vegetative cover including extensive recreation.

(2) Natural soil groups A-1c, B-1d, B-1e, C-1d, C-1e, D-1, and D-2. Uses that maintain permanent vegetative cover including extensive recreation.

2. Conditional Land Uses Based on Soil Characteristics

The following land uses will require regulation and the application of a sound conservation plan to avoid undue deterioration of the streambelt.

a. In all areas of the streambelt:

(1) Highways, roads, utility transmission and pipe lines, dams, bridges, mining, quarrying, earth removal, and dredging.

(2) Small recreational buildings, boat docks, ramps, etc. (These will be subject to state statutory provisions, local ordinances, and other environmental review procedures.)

b. In addition to those state in 'a' above, certain other uses are conditional in the following areas:

Natural soil groups A-3, B-3, C-3, and F-1: embankment, dugout, and bypass ponds for irrigation, recreation, wildlife, etc., level ditching, and other wetland wildlife improvements. (These uses are conditional on conservation plans and engineering designs provided or approved by the soil conservation district or other state resource agencies.)

3. Restricted Land Uses Based on Soil Characteristics

The following land uses generally are not compatible with the objectives of a streambelt system.

a. In all areas of the streambelt:

(1) Residential, commercial, industrial, and institutional buildings.
(2) On-site sewage disposal.
(3) Any solid or liquid waste or refuse disposal including sanitary landfills.
(4) Junk yards, commercial and industrial storage.
(5) Barns, stables, feedlots, barnyards, dry lots, poultry buildings, and farm waste disposal.
(6) Access to watercourses by domestic livestock.

b. In addition to those uses stated in 'a' above, certain other uses are restricted:

Natural soil groups A-3, B-3, C-3, E-3 and F-1: cropland, hayland, and pasture and drainage and land filling.

Implementing a Streambelt System

An early step in implementing a streambelt system is a public information program. The Litchfield County Conservation District can assist with such a program. Full use should be made of public meetings and the news media in order to obtain consideration by the public of their objectives with respect to a streambelt program.

Several means of achieving public goals are:

1. Obtain wise land use and natural resource development on public and privately owned lands within streambelts by promoting local participation in the activities of the Litchfield County Soil and Water Conservation District.

2. Public acquisition of streambelt lands.

3. Acquisition by private land trusts.

4. Conservation easements.

5. Effectively implement regulations of the state relating to health and sanitation, water pollution, stream channel encroachment, inland wetlands, etc.

6. Adhere to flood hazard or flood insurance programs.

7. Utilize programs offered by the King's Mark Resource Conservation and Development Area.

8. Have local agencies such as the NWCRPA and the LCCD review applications and plans for changes in land use within streambelt areas.

Land use regulations: As a prerequisite to enactment of streambelt regulations, the towns should have a comprehensive plan which reflects its objectives for preserving and wisely using the streambelts. The comprehensive plan (consisting of of maps and other information) should show in general the areas delineated as the streambelt.

In addition to planning maps, there should be an official streambelt map established by the planning and zoning commissions (or other designated body) and adopted by the legislative bodies as part of the streambelt ordinance.

Where this is done, town comprehensive plans may include streambelts consisting of two main categories--a core or streambelt protected by special regulations, and associated areas included in the overall streambelt and controlled only by the normal zoning regulations.

In the second category mentioned above are areas or sites that towns have planned as part of an overall streambelt system, but where special land use controls are not justified or practical. These areas or sites would have special or significant values as open space and for public use. For instance, scenic overlooks and features, historic sites, areas with potential for public recreation, etc.

Time is the most important consideration. Each day there is new evidence of damage by encroachment, pollution, or other types of destruction of streambelts. The identification of environmental corridors and wise decisions by local people on how to manage and implement streambelts will help considerably in protecting the quality of the environment in the West Woods Skiff Mountain area of Sharon and Kent.

The Litchfield County Conservation District has prepared a streambelt map of the West Woods-Skiff Mountain Area. Due to the complexity of this mapping, only one copy was prepared (available at the Litchfield County Conservation District office). A simplified version of this map however is presented in Figure 4 of this report. The criteria used in establishing the setback distances for this mapping is based upon natural soil groups and USDA Soil Conservation Service standards. The Appendix of this report identifies the criteria utilized for the streambelt delineation.

D. Zoning Alternatives

Within the West Woods-Skiff Mountain area, the Town of Sharon is zoned for 2 acre minimum lot size and the Town of Kent is zoned for 1 acre minimum lot size. It should be noted, however, that proposed zoning regulations for the Town of Kent would up-zone the West Woods-Skiff Mountain area of town to 2 acres.

Zoning is the principal tool utilized in Connecticut today to control the density of development in residential areas. Whether to re-zone any or all of the West Woods-Skiff Mountain area is a local decision. A wide variety of environmental, social, and economic considerations should be carefully addressed in arriving at such a decision. This report discusses the natural resource base of the West Woods-Skiff Mountain area. As such it may be used as a basis for determining the environmental carrying capacity of this land. Once again, however, additional considerations need to be addressed in determining the "best" zoning classification for a particular area. It is beyond the scope of this report to discuss the social and economic aspects of alternate zoning schemes in the West Woods-Skiff Mountain area. Therefore, outside of the streambelt ordinance discussed in the previous section, this report will not recommend one form of zoning over another. It will however discuss two alternatives which should be considered by the towns of Kent and Sharon in planning the future use of the West Woods-Skiff Mountain area. These include: 1) the use of soils information in zoning and 2) provisions for cluster development.

1. Using Soils Information in Zoning

The Northwestern Connecticut Regional Planning Agency has prepared a manual 'Using Soils Information in Zoning' which sets forth a conceptually sound outline for rural towns to use in establishing minimum lot sizes based in part on the characteristics of soil groups.

This concept may have validity in the study area. Although Sharon has two acre zoning in the study area and Kent has once acre minimum lot size, the soils based zoning procedure may be a more exact way of ensuring proper development in an area dependent upon on-site wells and septic systems.

In the West Woods-Skiff Mountain area, given that the boundaries of the study area are arbitrarily set, the Planning and Zoning Commission would have to decide what the boundaries of the soil based zoning area would be if they adopted this procedure. As discussed in 'Using Soils Information in Zoning', lot sizes will have to be based on factors which include, but are not limited to soil characteristics. The Sharon Planning and Zoning Commission would have to review any new soils based zoning procedure against the soil based zoning regulations adopted for the "Sharon public water supply watershed land" to make sure they are conceptually and technically compatible. For more information on soils based zoning, the NWCRPA should be contacted.

2. Cluster Development

A form of development available to the two towns in the West Woods-Skiff Mountain area which can help preserve the rural character of the area and its natural features is cluster zoning. Under cluster zoning, homes can be grouped in one area of a parcel, while the remainder can be preserved as open space, wetlands, farmlands, scenic vistas, etc. In the study area in particular, the proper placement of homes in a cluster out of the sight of the areas roads can help preserve the undeveloped, scenic character of the area as seen from its roads. It is critical to note that the overall density of a parcel does not change with clustering. In addition to the land preservation benefits, clustering can lower development costs by shortening the length of new roads and utilities needed to serve a development.

There are also disadvantages to cluster development. With the reduction of lot size involved in a cluster proposal, chances are raised significantly for the need for a community water and/or septic system. A community water system may require careful siting given the generally low water yields of the bedrock in the area. Likewise, given the generally severe soil limitations for septic systems in the West Woods-Skiff Mountain area, a community septic system would likely require careful design and installation. Approval of such a system would be required from both the State Health Department and the Connecticut Department of Environmental Protection. It should be recognized that under state regulations, the towns would face the ultimate responsibility for maintaining such a system if the system failed and the homeowners were unable or unwilling to correct the problem.

In discussing cluster development in the Westwoods-Skiff Mountain area, it is recommended that the housing form remain as detached single family units rather than townhouses or apartments. Given the very rural and undeveloped nature of

the study area, it would be out of character to allow the last two development possibilities. The clustering of single family homes if done in a design sensitive manner could result in a settlement pattern similar to the much older neighboring villages of Amenia Union and Ellsworth.

E. Additional Tools for Land Management

Given the sparse population density and undeveloped nature of the study area and the presence of important forestry, agricultural, energy, and water resources, a principal land management goal should be the proper husbanding of these resources while allowing the residents to maximize their self-sufficiency in energy and food production.

To reach this goal the following actions are suggested:

1. Timber resources.

   a. Encourage the provision of wood lots with each new dwelling unit.

   b. Encourage management of timber lands to permit not only the removal of wood for heating but also the harvesting of lumber. The lumbering should be done only according to proper controls as recommended by the State Forester and Soil Conservation Service.

2. Farmland resources.

   a. Despite the area's general appearance of rocky, unproductive soils, there are important prime agricultural lands scattered throughout the area. Some of these have been abandoned while others are still actively farmed. Efforts should be made to preserve the actively farmed lands from abandonment and the abandoned lands from residential development. A preservation possibility is the purchase of farmlands by either local conservancy groups or the town. On a limited scale residents should be encouraged to establish gardens or orchards on their productive land. Although the amount of land needed for such gardens is comparatively small, its importance in providing fruits and vegetables at the local level can be great.

3. Energy Resources.

   a. Use of wood lots and their management has already been recommended.

   b. Use of solar energy through the proper placement of lots and buildings on south facing slopes should be maximized.

   c. If the results of current wind speed testing on Skiff Mountain are favorable, encourage the development of wind-powered electric generators. However, these generators should be of such a scale in such a location as to be compatible with the surrounding area.

4. Water Resources

a. Given the steep slopes prevalent in the area, it is recommended that erosion and sedimentation control plans be required for all subdivision projects.

b. In the Macedonia Brook Watershed, water quality in the streams tributary to the Macedonia Brook Aquifer (located downstream of the study area) should be protected since this aquifer may be an important future water supply for Kent Center.

c. The water quality of the streams and ponds in the area should be maintained in part by establishing streambelt regulations as discussed in a previous section of this report.

d. While dirt roads help maintain the scenic quality of the area, their location adjacent to principal water courses may represent a threat to water quality. This is particularly true in areas such as Macedonia Brook State Park where the park roads parallel the river for long stretches. It would be desirable to inspect such roads and, if they are contributing to water pollution, implement necessary control measures to reduce or eliminate their pollution.

5. Other Actions

Additional regulations which can be used to protect the rural character of this area include:

a. Establishment of a Scenic Road Preservation Ordinance as discussed in a previous section of this report.

b. Open Space Provisions. Through its subdivision regulations, the Planning Commission can require the provision of open space lands in proposals it reviews. The placing of these lands adjacent to an existing scenic road can form an effective visual buffer of building activities.

c. Energy Considerations.
Zoning regulations can be adopted which insure proper safety precautions for windmills. Several communities have proposed such regulations in the State.

Subdivision regulations can also be amended to make solar access considerations a part of the review process. Criteria for the design and placement of buildings and the layout of subdivision roads have been proposed in several towns.

6. Local Conservancy

In addition to tools which are available through the town's zoning and subdivision regulations there is another option which may, if successful, have a greater impact on achieving land management goals than the institution of additional zoning and subdivision regulations. This is the creation of a town or area-wide conservancy whose purpose is to promote the goal and

objective of proper land management. This group of people would either possess the technical expertise, or be able to tap such expertise, to assist property owners in preserving, managing or developing their lands. This group could be responsible for the following activities.

a. Work with property owners to encourage them to manage their wood resources as a source of fuel and lumber.

b. Seek the protection through property donations, conservation easements, or sale of areas of unique natural and historical interest such as scenic ravines, or watercourses.

c. Assist property owners and developers in laying out development plans that would further the objectives of protecting the natural features and further the goals of resource management in the West Woods-Skiff Mountain area. Conservancies such as this have been established in several communities in Massachusetts and are proving effective.

d. As an adjunct to c above, several techniques can be used by the Conservancy to preserve existing farms and/or farm land, and to prevent their conversion into residential use. They may advise on the favorability of cluster development to preserve agricultural lands, encourage the purchase of farm land, accept land donations, and in critical instances, lobby for town purchase.

To conclude, there are a number of alternatives available to help maintain the environmental quality of the West Woods-Skiff Mountain area. This report does not present a "plan" for the area but rather a data base upon which such a plan can be prepared. Hopefully, ideas brought forth in this report will stimulate additional thought and discussion leading to the preparation and implementation of such a plan.

In addition to environmental considerations, future planning for the area should also include social and economic analyses (e.g. what is the need for low cost housing and additional public park land; what do the people of the area really want). As many citizens as possible should be involved in this planning decision-making process.

Regardless of what future planning is performed for the area, it is hoped that this report will help make the development process more sensitive to the important natural and cultural resources of the area. The West Woods-Skiff Mountain area is a special place. Future growth should be promoted only within the suitabilities and capacities of the land.

V. APPENDIX

APPENDIX A

Soil Survey Criteria for Streambelt Delineation

The following approach utilizes Natural Soil Groups 1/ in the process of streambelt designation and setting forth appropriate uses of these natural resources. It should be recognized that the groupings are used primarily for the purpose of categorizing soils and organization of material. The actual delineations on a town map would be based on the soil boundaries shown on detailed soil survey maps.

Areas in proximity to named streams and their tributaries shown on USGS topographical maps and consisting of the soils as specified in the following groupings shall be included in the streambelts. The watercourses consist of the beds, banks, and water of the named streams and their tributaries.

A-1a, A-1b, A-1d, A-1e, C-1 — Excessively drained terrace soils and well drained terrace soils with slopes less than 15 percent:

Shall include the areas of these soils that because of proximity to the watercourses, the soil patterns, steepness of slope, or surface water drainage require controlled land use to minimize the hazard of pollution, erosion and sedimentation. As a minimum, the streambelt zone shall include these soils that are less than 150 feet from any of the following: the watercourse, its floodplain, or poorly or very poorly drained soils contiguous to the watercourse or its floodplain. Also, it shall include areas of these soils what are within 50 feet of a terrace escarpment that is within the streambelt.

A-1c — Terrace escarpments:

Shall include terrace escarpments adjacent to either the watercourse, or its floodplain, or poorly drained or very poorly drained soils contiguous to the watercourse or its floodplain.

A-2 — Moderately well drained soils:

Shall include areas of these soils contiguour to the watercourse or its floodplain, or poorly or very poorly drained soils contiguous to the watercourse or its floodplain.

A-3, B-3, C-3 — Poorly and very poorly drained terrace soils:

Shall include these soils where they are contiguous to either the watercourse or its floodplain.

1/ Know Your Land - Natural Soil Groups for Connecticut
U.S.D.A. Soil Conservation Service and Connecticut Cooperative Extension Service, No. 71-56

B-1a, B-1b, B-1c, C-1a, C-1b, C-1c — Well drained upland soils with slopes less than 15 percent:

Sufficient areas of these soils shall be included to provide suitable width and continuity for a streambelt to meet public objectives. As a minimum, the streambelt shall include these soils less than 150 feet from any of the following: the watercourse, its floodplain, or poorly or very poorly drained soils contiguous to the watercourse or its floodplain.

B-1d, B-1e, C-1d, C-1e — Well drained upland soils with slopes more than 15 percent:

Shall include the areas of these soils that because of proximity to the watercourse, the soil patterns, or surface water drainage require controlled land use to minimize the hazard of pollution or erosion and sedimentation. As a minimum, the streambelts shall include areas of these soils that are contiguous to the watercourse or its floodplain, and which are within 200 feet of the watercourse, its floodplain or poorly drained or very poorly drained soils contiguous to the watercourse or its floodplain.

B-2, C-2 — Moderately well drained upland soils:

Shall include sufficient areas of these soils to provide suitable width and continuity for a streambelt to meet public objectives. As a minimum, the streambelt shall include these soils that are less than 150 feet from any of the following: the watercourse, its floodplain, or poorly or very poorly drained soils contiguous to the watercourse or its floodplain.

D-1 — Rocky and very rocky upland soils with slopes less than 15 percent:

Shall include areas of these soils where proximity to the watercourse, soil patterns, or surface water drainage require controlled land use to minimize the hazard of pollution or erosion and sedimentation. As a minimum, it shall include these soils which are contiguous to the watercourse or its floodplain and which are within 200 feet of the watercourse, its floodplain, or poorly or very poorly drained soils contiguous to the watercourse or its floodplain.

D-2 — Rocky and very rocky upland soils with slopes more than 15 percent, and extremely rocky soils:

Shall include areas of these soils where proximity to the watercourse and soil pattern or surface water drainage require controlled land use to minimize the hazard of pollution or erosion and sedimentation.

As a minimum, it shall include these soils that are contiguous to the watercourse or its floodplain, and which are less than 300 feet from the watercourse, its floodplain or poorly drained or very poorly drained soils contiguous to the watercourse or its floodplain.

E Floodplain soils:

Shall include all floodplain soils.

F Marsh and swamp soils:

Shall include the area of these soils which adjoin the watercourse or its floodplain.

Connecticut Natural Soil Groups Legend

A - TERRACE SOILS -- OVER SANDS AND GRAVELS

A-1 - Excessively drained to well drained soils

A-1a - Excessively drained soils with slopes less than 8 percent

A-1b - Excessively drained soils with irregular slopes between 3 and 15 percent, or smooth slopes between 8 and 15 percent

A-1c - Excessively drained soils with slopes above 15 percent

A-1d - Well drained soils with slopes less than 8 percent

A-1e - Well drained soils with slopes between 8 and 15 percent

A-2 - Soils with moderately high seasonal water table

A-3 - Poorly and very poorly drained soils

A-3a - Soils with high seasonal water table

A-3b - Soils with high water table during most of the year

B - UPLAND SOILS -- OVER FRIABLE TO FIRM GLACIAL TILL

B-1 - Well drained soils

B-1a - Non-stony and stony soils with slopes less than 8 percent

B-1b - Non-stony and stony soils with slopes between 8 and 15 percent

B-1c - Very stony soils with slopes less than 15 percent

B-1d - Non-stony and stony soils with slopes above 15 percent

B-1e - Very stony soils with slopes above 15 percent

B-2 - Moderately well drained soils

B-2a - Non-stony and stony soils with moderately high seasonal water table

B-2b - Very stony soils with moderately high seasonal water table

B-3 - Poorly and very poorly drained soils

B-3a - Non-stony and stony soils with high seasonal water table

B-3b - Soils with high water table during most of the year

C - UPLAND SOILS -- OVER COMPACT GLACIAL TILL (HARDPAN)

C-1 - Well drained soils

C-1a - Non-stony and stony soils with slopes less than 8 percent

C-1b - Non-stony and stony soils with slopes between 8 and 15 percent

C-1c - Very stony soils with slopes less than 15 percent

C-2 - Moderately well drained soils

C-2a - Non-stony and stony soils with moderately high seasonal water table

C-2b - Very stony soils with moderately high seasonal water table

C-3 - Poorly and very poorly drained soils

C-3a - Non-stony and stony soils with high seasonal water table

C-3b - Soils with high water table during most of the year

D - UPLAND SOILS -- ROCKY AND SHALLOW TO BEDROCK

D-1 - Rocky and very rocky soils with slopes less than 15 percent

D-2 - Rocky and very rocky soils with slopes more than 15 percent and extremely rocky soils

E - FLOODPLAIN SOILS

E-1 - Well drained soils

E-2 - Soils with moderately high seasonal water table

E-3 - Poorly and very poorly drained soils

E-3a - Soils with high seasonal water table

E-3b - Soils with high water table during most of the year

F - MARSH AND SWAMP SOILS

F-1 - Deep peat and muck soils with high water table during most of the year

F-2 - Soils at or near the coast line that are flooded during high tide

G - LAKE TERRACE SOILS -- OVER STRATA HIGH IN SILT AND CLAY

G-1 - Well drained soils

G-2 - Soils with moderately high seasonal water table

G-3 - Poorly and very poorly drained soils

G-3a - Soils with high seasonal water table

G-3b - Soils with high water table during most of the year

U - OTHER LAND -- UNCLASSIFIED

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 industrical 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.