

ENVIRONMENTAL REVIEW TEAM REPORT



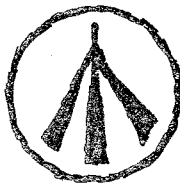
WILLIAMS ROAD PROPERTY
WALLINGFORD, CONNECTICUT

KING'S MARK
RESOURCE CONSERVATION & DEVELOPMENT AREA

KING'S MARK
ENVIRONMENTAL REVIEW TEAM REPORT

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WALLINGFORD, CONNECTICUT

OCTOBER, 1982



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

ACKNOWLEDGMENTS

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

Federal Agencies

U.S.D.A. Soil Conservation Service

State Agencies

Department of Environmental Protection

Department of Health

University of Connecticut Cooperative Extension Service

Local Groups and Agencies

Litchfield County Soil and Water Conservation District

New Haven County Soil and Water Conservation District

Hartford County Soil and Water Conservation District

Fairfield County Soil and Water Conservation District

Northwestern Connecticut Regional Planning Agency

Valley Regional Planning Agency

Central Naugatuck Valley Regional Planning Agency

Housatonic Valley Council of Elected Officials

Southwestern Regional Planning Agency

Greater Bridgeport Regional Planning Agency

Regional Planning Agency of South Central Connecticut

Central Connecticut Regional Planning Agency

Capitol Regional Council of Governments

American Indian Archaeological Institute

Housatonic Valley Association

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FUNDING PROVIDED BY

State of Connecticut

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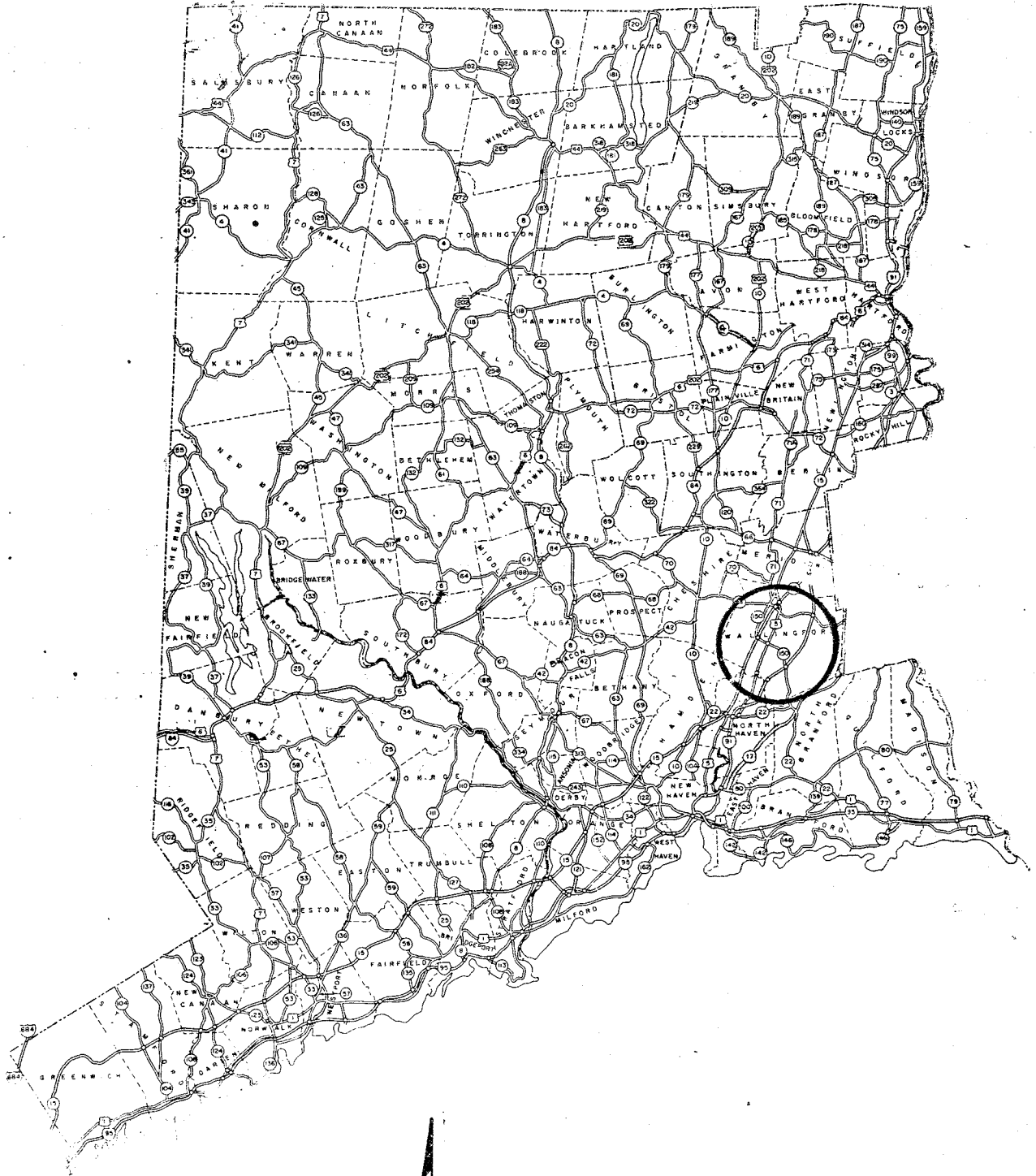
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LOCATION OF STUDY SITE



SCALE: 1" = 10 miles



ENVIRONMENTAL REVIEW TEAM REPORT

ON

WILLIAMS ROAD PROPERTY

WALLINGFORD, CT

I. INTRODUCTION

The Williams Road Property is \pm 10 acres in size and located in the southeastern quarter of town off Williams Road. As shown in Figure 1, the land consists of slight to moderate slopes with some steep relief along the northern border. Open field exists on about 5 acres of the site; elsewhere the property is wooded. A dirt access road to the interior of the site runs from Williams Road to the major open field on the site. Two major streams traverse the property; one along the northern border, the other along the eastern portion of the site. A wetland corridor flanks each side of the easternmost stream.

The Williams Road Property is owned by the Wallingford Land Trust. The Land Trust is in the process of preparing a long range management plan for the site. The Trust, in cooperation with the Wallingford Conservation Commission, requested this ERT study to help in the preparation of the management plan. Specifically, the ERT was asked to identify the natural resource base of the site and to discuss opportunities and limitations for land management. The Land Trust also asked for specific advice on how to prevent further farm field erosion and streambank scouring.

The King's Mark Executive Committee considered the Land Trust's request, and approved the project for review by the Team.

The ERT met and field reviewed the site on August 9, 1982. Team members participating on this project included:

Brant Burz.....	Wildlife Biologist.....	Ct. Dept. of Environmental Protection
Frank Indorf.....	District Conservationist..	U.S.D.A. Soil Conservation Service
Andy Petracco.....	Recreation Specialist.....	Ct. Dept. of Environmental Protection
Don Smith.....	Forester.....	Ct. Dept. of Environmental Protection
Irene Winkler.....	Soil Conservationist.....	U.S.D.A. Soil Conservation Service
Mike Zizka.....	Geohydrologist.....	Ct. Dept. of Environmental Protection

Prior to the field review day, each team member was provided with a summary of the proposed study, a checklist of concerns to address, a topographic map, a soils map, and a soils limitation chart. During the ERT's field review, team members met

FIGURE 1.

TOPOGRAPHIC MAP

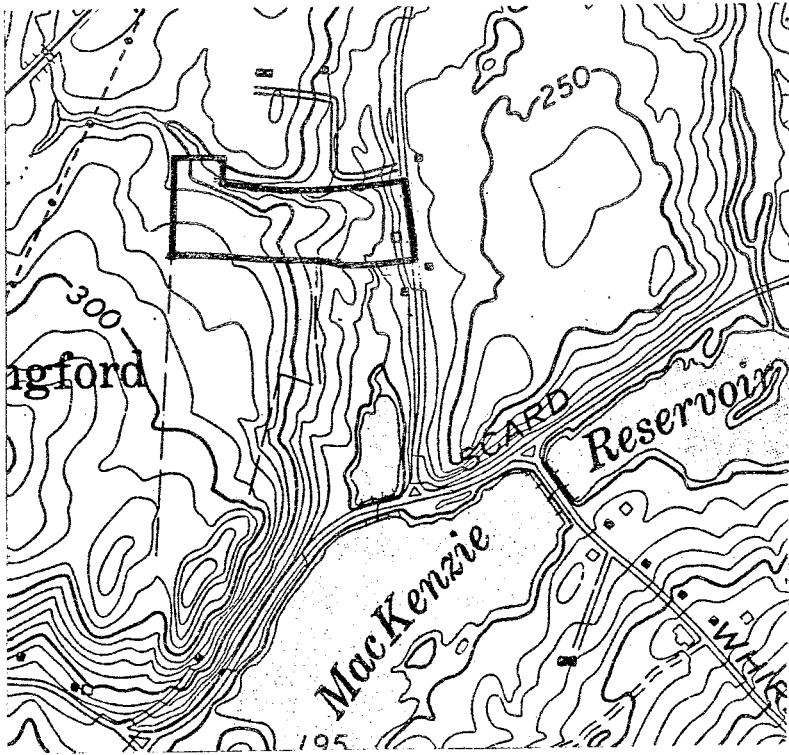
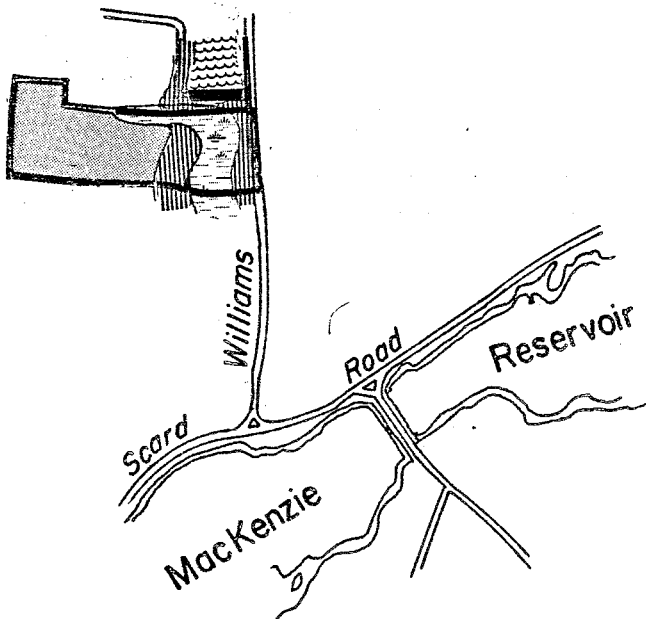


FIGURE 2.

SURFICIAL GEOLOGY

SCALE:
1" = 1000'



EXPLANATION

- Till
- Stratified drift
- Swamp and alluvial deposits
- Artificial fill
- Pond

with representatives from the Land Trust and walked the property. Following the field review, individual reports were prepared by each team member and forwarded to the ERT Coordinator for compilation and editing into this final report.

This report presents the team's findings. The report identifies the natural resources base of the property and discusses opportunities and limitations for land management. All conclusions and final decisions with regard to future land use rest with the Wallingford Land Trust. It is hoped the information contained in this report will assist the Land Trust 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. GEOLOGY

The Williams Road property is encompassed by the Wallingford topographic quadrangle. The Connecticut Geological and Natural History Survey has published a map and report, by Stephen C. Porter, describing the surficial geology of the quadrangle (Quadrangle Report No. 10). The map indicates that the Williams Road parcel contains two principal surficial geologic units: till and stratified drift (see Figure 2). Both are glacial sediments.

Till was deposited directly from glacier ice, either as the ice was advancing or as it melted during deglaciation (the former mode of deposition is responsible for the bulk of the till deposits in Connecticut). Because the individual mineral grains and rock fragments were not significantly reworked by meltwater before deposition, the till consists of a complex mixture of sand, silt, clay, pebbles, cobbles, and boulders. These particles had previously been accumulated into the advancing ice sheet from preexisting soils and from bedrock which had been abraded, gouged, and broken by the ice.

The till on the Williams Road property is sandy, stony, and moderately compact in most places. At depths of two feet or more, the till may become tightly compact. The overall thickness of the till is not known, but it is probably less than 20 feet.

Stratified drift occupies the eastern portion of the site. Stratified drift, which partly derives its name from its typical prominent layering, consists of rock particles and fragments that were washed away from a glacial ice mass by meltwater streams. Sorting of sedimentary particles by grain size occurred during this depositional process; as a result, individual layers, or "beds", of the stratified drift tend to be composed of similarly sized grains. Gravel and sand are the predominant constituents of the local stratified drift.

Not shown on the Wallingford surficial geologic map are thin swamp and alluvial sediments that are present on the property. The alluvial sediments consist of silt and sand deposited by the on-site streams during flood stages. The swamp sediments consist of silt, sand, clay, and a high percentage of decayed organic material. The combined depth of the swamp and alluvial sediments on the property is probably less than five feet.

No bedrock outcrops were seen on the site. The rock underlying the site is arkose (a feldspar-rich sandstone), arkosic siltstone, and mudstone. Boulders derived from these rocks are scattered along the streamcourse near the northern boundary of the parcel. Also present are boulders of basalt, a volcanic rock. The basalt boulders were presumably transported to their present location by glacial action.

Except for the swampy and floodplain areas and the steep slopes bordering the main stream, the site affords good development potential. Active recreational facilities could be established without great difficulty, as could support facilities such as toilets with subsurface sewage disposal fields. The property also has good potential for crops.

III. HYDROLOGY

The Williams Road property lies entirely within the watershed of MacKenzie (Pine River) Reservoir, a public water-supply reservoir. The reservoir has a drainage area of 8.92 square miles, a surface area of 70 acres, and a usable storage capacity of 225 million gallons.

Virtually all of the runoff that leaves the site is collected by an unnamed tributary of the reservoir. The tributary has a drainage area of about 475 acres at the point where it leaves the property. The drainage area is beginning to undergo substantial development: a comparison of two topographic maps of Wallingford, dated 1954 and 1967, respectively, shows that many new homes were constructed in the intervening period along Jobs Road, Durham Road, and North Airline Road. Interstate Route 91 was also run through the area.

The tributary stream flows south from its point of origin 4000 feet north of the site until it crosses the old Penn Central railroad. It then curves sharply eastward, flowing along the northern boundary of the parcel. Near Williams Road, the tributary curves sharply southward again and flows through a 36-inch culvert under the dirt access road to the site. The culvert is inadequate to pass the peak flows from large storm events; consequently, the access road has been inundated several times within the past two or three-years alone. The road was washed out at least once.

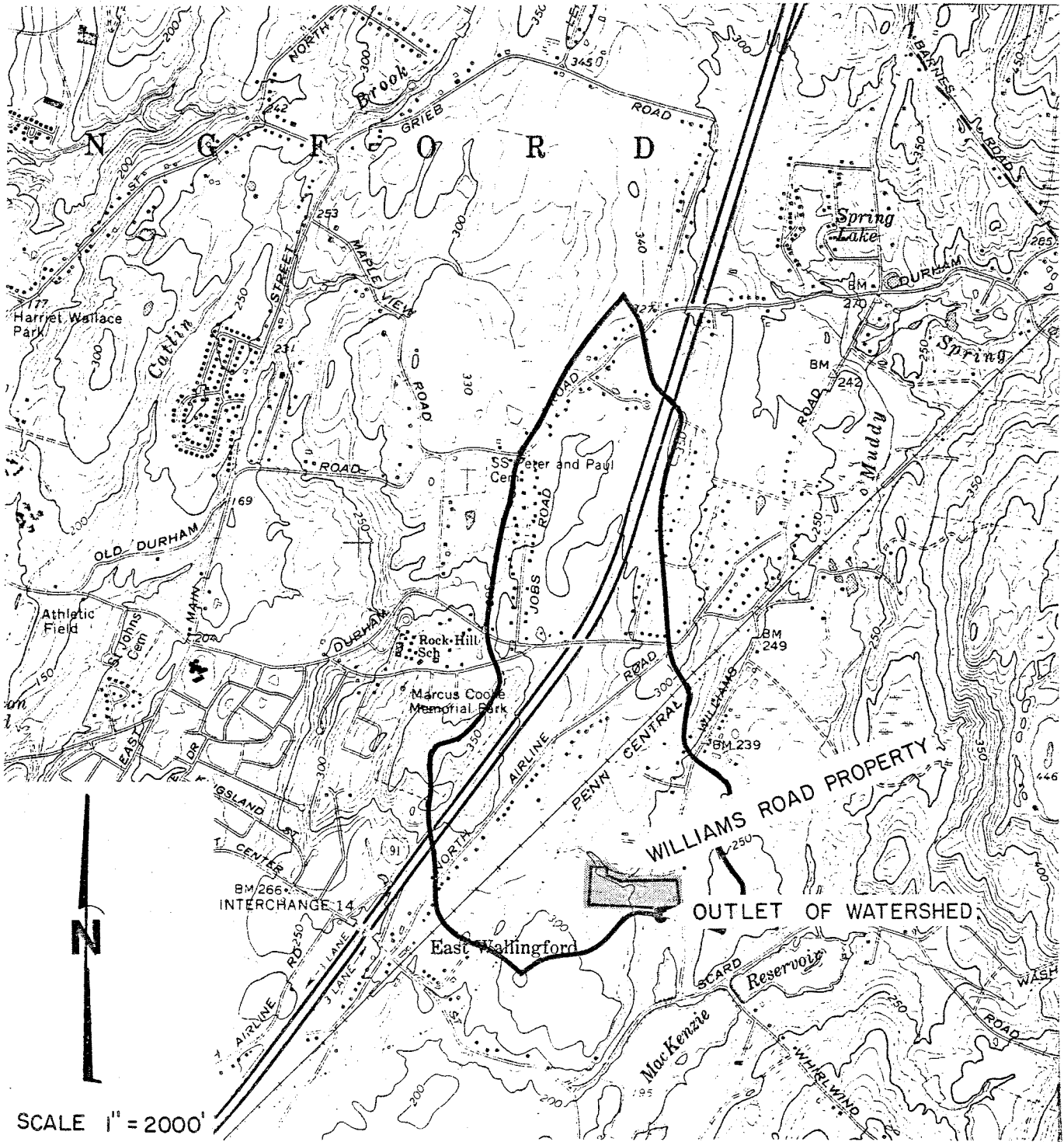
There are three principal factors responsible for the inadequacy of the present culvert: insufficient size of the pipe, inadequate head, and a poor entrance route for the flows into the pipe. The Team used the SCS runoff-curve-number method to estimate the peak flows that would occur at the culvert for a 10-year storm and a 25-year storm. The estimates are 215 cubic feet per second (cfs) for the 10 year storm and 320 cfs for the 25 year storm. The present pipe should be replaced with one or more new pipes that can accommodate these flows freely. Head is the term given to the height of water above the culvert pipe. The greater the head, the more pressure is exerted on the water moving through the pipe, and consequently, the faster is the flow. Head can be increased simply by building up the level of the road above the culvert pipe(s). The pipe(s) should also be realigned so that water will flow more directly into it (them).

The swampy area in the southeastern corner of the property should be left alone. In addition to its potential as a source of water, food, and shelter for wildlife, the wetland has several valuable hydrologic functions. It serves as a trap for sediment during heavy flows in the main stream. On the day of the field review, the Team observed the stream a short time after a brief but heavy downpour, and noted that the stream was very turbid above the wetland. Hummocky sand and silt deposits along the stream banks indicate the sediment storage ability of the wetlands.

The wetlands also have a floodwater-storage function. By retaining water temporarily during heavy flows, the wetlands reduce downstream peak flows and thereby help to reduce erosion and other flood damage. If the culvert under the access road is upgraded, the water-storage function of the wetlands will be even more valuable.

FIGURE 3.

WATERSHED OF ON-SITE STREAM



Wetlands also have a capacity for removing many common pollutants (e.g. phosphates) from inflowing waters. This buffering function will increase in value as the watershed of the main stream is developed further. Hence, the wetlands serve as a small, but possibly significant, safety valve for the protection of the MacKenzie (Pine River) Reservoir.

IV. WATER SUPPLY

No public water-supply lines are presently available to the site. It is not clear whether the future use of the site by the Wallingford Land Trust will necessitate the development of a well on the parcel. If a use requiring relatively small amounts of water is established, two possible groundwater sources are available: bedrock and stratified drift.

The bedrock underlying the site is chiefly arkose and arkosic siltstone. These sedimentary rocks tend to be highly fractured and therefore are often more productive of groundwater than the crystalline rock types which dominate the eastern and western third of the state. In Connecticut Water Resources Bulletin No. 27, a study of the Quinnipiac and nearby, smaller, river basins, it is noted that 95 percent of 925 surveyed wells tapping sedimentary bedrock yielded at least 2 gallons per minutes (gpm) of groundwater; 90 percent yielded at least 3 gpm; and 80 percent yielded at least 6 gpm. Although small, these yields may be adequate for many uses as long as sufficient storage capacity is available to meet peak demands. A well capable of yielding 2 gpm, for instance, can produce 2160 gallons if pumped continuously for 18 hours.

The thickness of the stratified drift on the site and the depth to the water table are not known. It is unlikely that the saturated section is thick enough to allow the development of truly high-yielding wells (i.e. wells that yield more than 100 gpm). However, if there is at least 10 feet of saturated thickness, small yields may be readily obtainable. The problem with such shallow wells is that they may become inadequate during dry spells when the local water table drops. It is possible that even small yields could be unobtainable during a severe drought. If the saturated section is at least 20 feet thick and entirely coarse-grained, small or moderate yields should be available even during droughts.

Hardness is frequently a problem with groundwater obtained from sedimentary bedrock or from stratified drift overlying such rock. Otherwise, the natural quality of the local groundwater should be good.

V. VEGETATION

A. General Comments

The Wallingford Land Trust property has limited potential for forest management due to its small size. Forest management, as used in this report, refers to the manipulation of forest vegetation, usually through the cutting of trees or the planting of trees to bring about, maintain or improve certain desirable forest conditions.

When properly prescribed and executed, forest management practices will increase the production of forest products, improve wildlife habitat, improve forest aesthetics and enhance the overall condition of the woodland. Without sound management there is no control over the quality of these conditions. Specific management opportunities are outlined for each vegetation type within the property. For more detailed information a public service forester with DEP or a private forester should be contacted.

Thinning harvests are prescribed in stands where trees are declining in health and vigor due to overcrowding. These thinnings are designed to reduce competition between residual trees for space, sunlight, water and nutrients. Only trees that are of poor quality, damaged, or in direct competition with high quality trees should be removed during these thinnings. Stands once thinned should become more stable, healthy and less susceptible to damage caused by insects, disease and adverse weather conditions.

Where no management practices are discussed, the vegetation is healthy as is. These areas should be reevaluated for future management needs at approximately 10 year intervals.

Areas such as the hardwood swamp which has little potential for forest management are also noted in the vegetation type description. These areas have little or no value for timber production, however their value for wildlife habitat and nature study is high.

Federal cost sharing may be available to help defray the costs of implementing some of the proposed management practices. For more specific details on cost sharing assistance please contact the New Haven County A.S.C.S. office in Wallingford, CT.

From a resource management and maintenance standpoint, it would be advisable to have the boundaries of the property clearly marked.

To maintain the quality of the trails which are present, periodic maintenance is essential. At least once a year all the trails throughout the property should be inventoried for erosion problems and dead or dying trees which represent a potential hazard. Erosion problem spots should be eliminated through the proper placement of water diversions, or relocation of the trails to avoid existing problem areas. Trees that are potentially hazardous should be promptly felled. For assistance in trail design and maintenance, the USDA SCS office in Wallingford should be contacted.

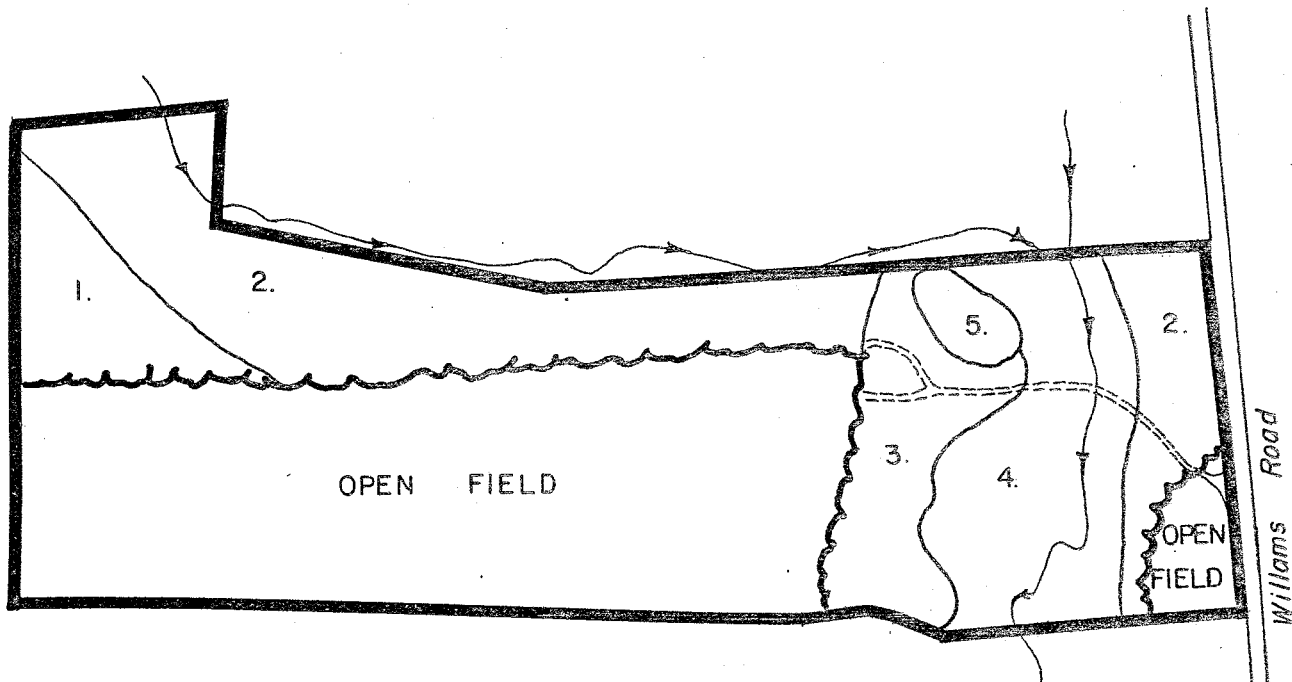
B. Vegetative Type Descriptions

The Williams Road property consists of 5 vegetation types in addition to the two open fields presently cultivated for hay (see Figure 4). Each of these vegetation types is discussed below.





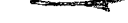
TYPE 1. MIXED HARDWOODS. 0.8 acres. This area is populated with pole sized (5-11 inch in diameter) black birch and red maple of acceptable quality on a damp site. Associated with these trees are a few larger red maples and red oaks. Some hickory and cherry exist in the more open field margins. The understory is composed of a large component of spicebush, some scattered red cedar

FIGURE 4.

VEGETATION TYPE MAP



LEGEND

-  FOREST BOUNDARY
-  STAND BOUNDARY
-  PAVED ROAD
-  ACCESS ROAD
-  STREAM

VEGETATION TYPES

- Stand 1. Mixed Hardwoods, pole size, 0.8 Acres
- Stand 2. Mixed Hardwoods, pole size on steeper terrain, 2.1 Acres
- Stand 3. Mixed Hardwoods, former old field, 0.7 Acres
- Stand 4. Hardwood Swamp, 1.4 Acres
- Stand 5. Old Field, 0.2 Acres
- Open Field (hayland), 4.3 Acres

dogwood, and ash seedlings, and maple-leaved viburnum and slippery elm in the more open areas. Ground cover here consists of sensitive, New York, maiden hair, cinnamon and hayscented ferns, barberry, wild geranium, jack-in-the-pulpit, horse balm, jewel weed, poison ivy, Virginia creeper, and scattered tufts of grasses.

Management is needed in two areas. The overstory needs to be thinned both to release the best quality stems and to allow more sunlight into the understory. The primary understory species, spicebush, needs to be discouraged (via cutting), in order to encourage hardwood reproduction and more desirable ground cover species.

TYPE 2. MIXED HARDWOODS. 2.1 acres. Similar in species composition, size, and vigor to type 1, this area tends to a steeper terrain with less moisture in the soils. There is a higher percentage of sugar maple present in the overstory and, thanks to the disappearance of spicebush, the understory as well. In places the understory is exclusively sugar maple. The ground cover here is similar to type 1 with the exception that Christmas fern and blackberry can be found here as well.

The area seems to be healthy. Management should be limited to the removal of poorly formed, diseased, or dead stems.

TYPE 3. MIXED HARDWOOD. 0.7 acres. This area of old field or pasture is characterized by an overstory of pole-sized cherry, ash, red maple, sugar maple, hickory, and scattered red cedar and apple. The overstory is dense enough in some areas to limit the understory growth. Sugar maple and ash can be found in the understory as both seedling and saplings. The ground cover consists of Christmas fern, poison ivy, Jack-in-the-pulpit, skunk cabbage, jewel weed, mosses, and grasses.

TYPE 4. HARDWOOD SWAMP. 1.4 acres. This area is characterized by a high water table ranging from periodically inundated moist areas to areas of standing water and hummocks. The overstory is almost exclusively pole sized red maple although ash can be found on the driest sites. The understory, due to the dense overstory, is very sparse consisting only of scattered red maple, elderberry, and sweet pepperbush. The ground cover consists of sensitive fern, royal fern, jewel weed, skunk cabbage, violet, Jack-in-the-pulpit, some spicebush reproduction, and hummocks of grasses. One brilliant cluster of cardinal flower was observed about 100' north of the access road in this area. Many consider cardinal flower to be Connecticut's most attractive wildflower.

Management activity involving vehicles would be best limited to winter months when the frost will support traffic. A thinning along the lines of that proposed in type 1 is needed here, but may not yield much in the way of useful products.

TYPE 5. OLD FIELD. 0.2 acre. This small area is recently abandoned and is populated with very scattered pole-sized red maple, cherry, and black birch. There is no definitive understory, but there is substantial open area populated with jewel weed, goldenrod, loosestrife, raspberry, multiflora rose, and grasses.

VI. WILDLIFE

Although the Williams Road property is comparatively small, a well rounded wildlife habitat component exists. The wildlife habitat associations include: + 1.4 acres of wetland, + 4.5 acres of openland/brushland (sometimes called upland), and 3.6 acres of wooded land.

Evaluating the existing habitat and management potential of a very small site such as the Williams Road Property is difficult without specific management goals or consideration of the surrounding lands. This is especially true when considering species such as turkeys--which may range over + 100 acres.

The Williams Road Property from a Wildlife stand point could best be managed if efforts are taken to enhance, and maintain an overall openland/upland wildlife management area. This can be accomplished by implementing the following:

- 1) Referring to Figure 4, areas numbered 1 and 3 could use one or two small (at least 1/4 acres) irregular shaped openings. These openings should be maintained by mowing every 3 - 5 years.
- 2) Create a feather edge between the open fields and the bordering forest stands of 20 to 25 feet. This will encourage shrubby vegetation growth which is valuable to wildlife. A cordwood cutting scheme could be used to open up this "feather edge".
- 3) Bluebird boxes could be constructed at the edges of the openings.
- 4) Pile brush along "edges" of openings for rabbits and other small mammals (6-8 brush piles/acre should be adequate).

When cutting any cordwood or sawtimber, efforts should be made to:

- 1) Leave at least 4 den trees (partially dead trees with cavities) and 3 snag trees (dead trees) per acre for non-game cavity nesting wildlife.
- 2) Encourage existing food and cover species such as vines, blueberry bushes and apple trees. Apple trees can become desirable wildlife foods by removing the surrounding overcrowding trees. Following this release cut, wait one year to allow for tree vigor, then prune and fertilize.
- 3) "Mast trees" (those producing nuts) such as oaks, beech and hickory should be encouraged. Mature sawtimber-size mast trees are the nut/food producers for wildlife such as chipmunks, deer, grouse, turkeys and others.

In addition to the above mentioned enhancement practices, the following should also be considered.

- 1) Leave a 15 foot uncut grass border around the edge of the existing hay fields. This area should be mowed on a 3 to 5 year schedule --never all at the same time, and preferably after August 1. These uncut "field borders" can serve as nesting and feeding areas for many avian species of wildlife.

- 2) Cut hay in open fields after August. This will cut down on disturbances to nesting wildlife.
- 3) Additional openings could be developed in the forestland habitats. These areas could be planted to wildlife cover species such as hemlock or pine species.

The wetland habitat could be enhanced by creating a few "pot holes" (via blasting) to encourage a permanent water source for waterfowl. Wood duck boxes could be put up at these small pot holes. Trees should be cleared back where these pot holes are created. This will produce that desirable "feather edge" needed by wildlife.

During the ERT's field review, a red tailed hawk, moderate deer browse and numerous song birds were observed. Additional wildlife that might utilize this property, either seasonally or year round, include pheasants, turkey, white footed deer mice, woodcock, pileated woodpeckers, fox and perhaps an occasional coyote.

Once a diversity of habitats is created, proper maintenance of newly created openings, field borders, apple tree releases, etc. needs to be implemented. Without proper maintenance schedules, native vegetation will succeed and lower the wildlife habitat potentials that were created.

VII. SOILS

As shown in Figure 5, six soil types have been mapped for this property. Each of these is described below.

Ra - Raynham silt loam. This soil is nearly level and poorly drained. A narrow band of this wetland soil type is located in the eastern portion of the property.

Typically, the surface layer is very dark grayish brown silt loam 6 inches thick. The subsoil is 17 inches thick. It is light brownish gray, mottled very fine sandy loam in the upper 5 inches and reddish brown, mottled silt loam below that. The substratum, to a depth of 60 inches, is reddish brown, mottled silt loam 9 inches thick over dark reddish brown, mottled very fine sandy loam.

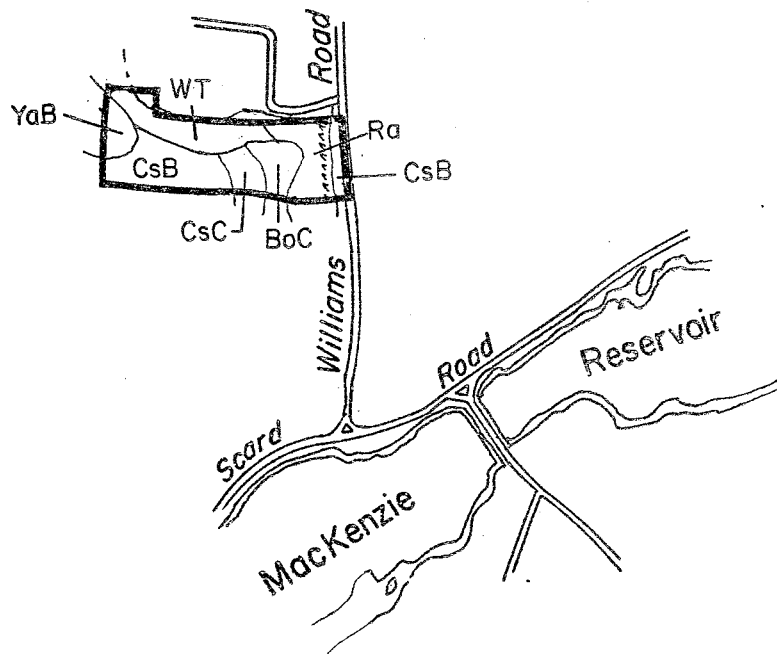
This soil has a seasonal high water table at a depth of about 8 inches from fall until mid-spring. Permeability is moderate or moderately slow in the surface layer and subsoil and slow in the substratum. This soil has a high available water capacity. Runoff is slow. This soil dries out and warms up slowly in the spring. It has a low shrink-swell potential. Unless limed, this soil is strongly acid through slightly acid in the surface layer and subsoil and medium acid through neutral in the substratum.

This soil has poor potential for recreational development.

This soil is not well suited to use as cropland. Wetness is the major limiting factor for crops, and drainage is needed for good crop production. Even with drainage, this soil remains wet for several days after a heavy rain, restricting the use of most kinds of farming equipment. Runoff and erosion are easy to control with simple conservation measures, such as the use of cover crops during winter.

FIGURE 5.

SOILS MAP



Soil boundary lines derived from smaller scale map (1" = 1320') and should not be viewed as precise boundaries but rather as a guide to the distribution of soils on the property.

Adapted from New Haven County Soil Survey, USDA-SCS

This soil is suited to trees. It has moderate productivity. It is limited mainly by wetness. The use of equipment is restricted if the soil is wet. Seedling mortality is high, and tree windthrow is common because the high water table restricts the rooting depth. Machine planting is feasible if the soil is not wet.

BoC - Branford silt loam, 8 to 15 percent slopes. This sloping, well drained soil is also located in the eastern portion of the site.

Typically, the surface layer is dark reddish brown silt loam 8 inches thick. The subsoil is reddish brown silt loam 14 inches thick. The substratum, to a depth of 60 inches, is reddish brown gravelly sand.

Permeability is moderate or moderately rapid in the surface layer and subsoil and rapid or very rapid in the substratum. This soil has moderate available water capacity. Runoff is rapid. This soil tends to dry out and warm up fairly early in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid.

This soil has fair potential for recreational development.

This soil is not well suited to cultivated crops because of the steepness of slope. The erosion hazard is severe, and rather intensive conservation measures are needed to prevent excessive runoff and erosion. This soil should have good vegetative cover most or all of the year.

This soil is well suited to growing trees. Productivity is moderately high. Care is needed in laying out logging roads and trails to avoid causing excessive erosion.

CsB - Cheshire fine sandy loam, 3 to 8 percent slopes. This gently sloping, well drained soil occupies about 50% of the site, including the hayfield.

Typically, the surface layer is dark brown fine sandy loam 8 inches thick. The subsoil is 18 inches thick. It is reddish brown, friable fine sandy loam. The substratum, to a depth of 60 inches, is reddish brown, friable, gravelly sandy loam and has discontinuous firm lenses up to 2 inches thick.

This soil has moderate permeability. It has a high available water capacity. Runoff is medium. This soil tends to dry out and warm up fairly early in spring. It has a low shrink-swell potential. Unless limed, this soil is medium acid through very strongly acid.

This soil has good potential for recreational development. It is fairly easy to excavate but commonly contains stones and boulders.

This soil is well suited to cultivated crops. It is easy to maintain in good tilth. The hazard of erosion is moderate, and controlling runoff and erosion is a concern in managing this soil. Maintaining good fertility and the organic matter content are also concerns. If this soil is cultivated, minimum tillage, use of cover crops, and including grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion. A few cobbles and stones are in the plow layer and are an annoyance with some tillage equipment.

This soil is well suited to growing trees. Productivity is moderate. Machine planting is practical in open areas.

CsC - Cheshire fine sandy loam, 8 to 15 percent slopes. This soil is identical to the CsB soil, only the slopes are steeper.

WT - Wilbraham and Menlo extremely stony silt loams. This undifferentiated group consists of nearly level to gently sloping, poorly drained and very poorly drained soils. This soil is found along the northern border of the site. About 3 to 25 percent of the surface is covered with stones and boulders. About 60 percent of the total acreage consists of Wilbraham extremely stony silt loam, about 30 percent is Menlo extremely stony silt loam, and about 10 percent is other soils.

The soils of this map unit were not separated in mapping because they react similarly to most uses and management. In many places, the soils occur in intricate patterns. The typical Wilbraham soil has a surface layer of very dark gray silt loam 4 inches thick. The subsoil is 21 inches thick; it is reddish brown, mottled silt loam. The substratum, described to a depth of 60 inches, is reddish brown, mottled, very firm loam. Typically, the Menlo soil has 3 inches of black muck on top of the surface layer. The surface layer is black silt loam 5 inches thick. The subsoil is 17 inches thick; it is 3 inches of gray, mottled silt loam over 14 inches of weak red, mottled loam. The substratum, described to a depth of 60 inches, is 8 inches of reddish brown, mottled, very firm loam over reddish brown, mottled, very firm gravelly loam.

From late in fall until mid-spring, the Wilbraham soils have a water table at a depth of about 8 inches. The Menlo soils have a water table at the surface from fall through spring and after heavy rains. In many places, they are ponded for several weeks in winter. During the summer, the water table in these soils may drop to a depth of 5 feet or more. Permeability is moderate in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is high. Runoff is slow or very slow. The soils have a low shrink-swell potential. In areas that are not limed, the Wilbraham soils are very strongly acid or strongly acid in the surface layer and subsoil and strongly acid or medium acid in the substratum. The Menlo soils are very strongly acid through medium acid in the surface layer and subsoil and strongly acid through slightly acid in the substratum.

The soils of this unit have poor potential for recreational development. They are limited mainly by the seasonal high water table, stoniness, and a slowly permeable substratum.

This unit is poorly suited to use as cropland. The use of farming equipment on these soils is not feasible because of the stoniness. Removal of the stones and boulders is very costly and generally not feasible.

This unit has fair suitability for woodland use. The Wilbraham soils have moderate productivity, and the Menlo soils have low productivity. The soils are limited mainly by their wetness and stoniness. Seedling mortality is high, and windthrow is common. The root zone is shallow because the water table is high throughout much of the year. Woodland, nevertheless, may be one of the best uses of these soils.

YaB - Yalesville fine sandy loam, 3 to 8 percent slopes. This gently sloping, well drained soil is found in the northwestern corner of the site.

Typically, the surface layer of this soil is dark brown fine sandy loam 8 inches thick. The subsoil is 17 inches thick. It is reddish brown, friable fine sandy loam and loam. The substratum, described to a depth of 36 inches, is reddish brown sandy loam. Reddish brown hard sandstone bedrock is at a depth below 36 inches.

This soil has moderate or moderately rapid permeability above the bedrock. The available water capacity is moderate. Runoff is medium. Good tilth is easy to maintain. This soil tends to dry out and warm up early in the spring. It has a low shrink-swell potential. In areas that are not limed, this soil is very strongly acid through medium acid.

This soil is well suited to cultivated crops. It is easy to maintain in good tilth. The hazard of erosion is moderate, and controlling runoff and erosion is a concern in managing this soil for farming. If this soil is cultivated, minimum tillage, use of cover crops, and including grasses and legumes in the cropping system help to reduce runoff and control erosion and sedimentation.

This soil is suited to growing trees. It has moderate productivity. Wind-throw is a hazard with large trees because of the limited rooting zone above the bedrock. Machine planting is practical in open areas.

Hayland and Streambank Erosion

To improve the quality and quantity of desirable hayland forage species on this site and to protect the soil from erosion, the hayland soil should be tested every three years and lime and fertilizer applied accordingly. The fields should also be seeded to a mixture of:

- 10 lbs./ac. - Iroquois Alfalfa
- 4 lbs./ac. - Climax Timothy
- or
- 10 lbs./ac. - Iroquois Alfalfa
- 5 lbs./ac. - Pennlate Orchard Grass

Seeding should take place between April 15 and May 31 or August 1 and August 31. Hay should not be harvested when the soil is wet or the sod is weak.

The streambed and banks should be lined with approximately 4 inches of gravel in the area where the animals cross. This will prevent erosion from occurring and help to keep the water free from sediment.

VIII. RECREATION

The ten acre Williams Road Property, though comparatively small from the standpoint of offering good passive recreational opportunities, is rather diverse in land form, affording good educational opportunities related to proper management techniques. The tract contains woodland, farmland, and wetland with its associated streamcourse forming part of the northerly and easterly bound. Woodland and open field (under cultivation) each comprise about half the property. The wetland is within the woodland component.

Access is via a dirt road to the back (west) end of the property from Williams Road which forms the eastern boundary. On-site parking can be provided along Williams Road.

Hiking, horseback riding and cross-country ski use of the parcel is reportedly occurring. There is limited potential for snow season use of the hayfield by sledders, tobogganers, and downhill skiers due to the moderate length and slope of the hillside. There are larger, more suitable hills in the area which, even if privately owned, may be available to better provide for these activities.

A small picnic area could be located in the drier, more moderately sloped portions of the property if such a facility were desired. Additional maintenance responsibilities would, of course, be associated with a picnic area. The land trust should not install anything it is incapable of either maintaining itself or arranging to have maintained.

Implementation of a coordinated management plan which includes appropriate forestry, agriculture, soil conservation, watershed protection, etc. techniques can be tied to an educational program which serves to show the visitor the reasons for following a sound management program. The best means for disseminating that information to users of the property is sometimes problematic. Interpretive signs along a trail can be vandalized and rendered worthless for their intended function. One method sometimes employed is the use of simple, numbered stations which are keyed to a pamphlet or handout sheet explaining the type of management techniques being employed at each station (location). The location where this handout (key) information can be obtained would have to be posted on site. Such a program would be contingent upon the land trust's resources to provide printed materials. The property boundaries should also be clearly posted. If this type of educational program is undertaken for this parcel, an interpretive (learning) trail with numbered stations should be routed through the diverse land forms found on the site.

Collecting before and after data (which relate to the effectiveness of management techniques) would provide a means of assessing the program's usefulness. Some "yardstick" must be used to gauge the relative merit of a particular management program. Before and after photo documentation and measurements of soil erosion, flash runoff, vegetative growth, etc. rates can be useful to this end. Local schools and possibly a nearby university might be recruited to collect this data and monitor the program in conjunction with class studies.

Learning and recreational experiences can be combined in an interpretive hiking/jogging trail. The study of human and natural forces working to shape

the land and its components, dovetailed with a purely recreational function, seems a viable proposal for use of the property. Construction of such a trail should be according to standards (available from the Soil Conservation Service) which will minimize the potential for increased erosion and maintenance. In trying to provide a high quality user experience, it may also be desirable to limit vehicular access into the property by gating off the dirt road.

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IX. APPENDIX

SOILS LIMITATION CHART

Limitation Ratings For:

MAP SYMBOL	SOIL NAME	CAMP AREAS	PICNIC AREAS	PLAYGROUNDS	PATHS & TRAILS
BoC	Branford silt loam, 8-15% slopes	Moderate; Slope	Moderate; Slope	Severe; Slope	Slight
CsB	Cheshire fine sandy loam, 3-8% slopes	Slight	Slight	Slight	Slight
CsC	Cheshire fine sandy loam, 8-15% slopes	Moderate; Slope	Moderate; Slope	Severe; Slope	Slight
Ra	Raynham silt loam	Severe; Wetness	Severe; Wetness	Severe; Wetness	Severe; Wetness
WT	Wilbraham and menlo extremely stony silt loam	Severe; Wetness, Large stones	Severe; Wetness, Large stones	Severe; Wetness, Large stones	Severe; Wetness, Large stones
YaB	Yalesville fine sandy loam, 3-8% slopes	Slight	Slight	Moderate; Slope, Depth to rock	Slight

EXPLANATION OF RATING SYSTEM:

1. SLIGHT LIMITATION: indicates that any property of the soil affecting use of the soil is relatively unimportant and can be overcome at little expense.
2. MODERATE LIMITATION: indicates that any property of the soil affecting use can be overcome at a somewhat higher expense.
3. SEVERE LIMITATION: indicates that the use of the soil is seriously limited by hazards or restrictions that require extensive and costly measures to overcome.

ABOUT THE TEAM

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

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

PURPOSE OF THE TEAM

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

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

REQUESTING A REVIEW

Environmental Reviews may be requested by the chief elected official of a municipality or the chairman of an administration agency such as planning and zoning, conservation, or inland wetlands. Requests for reviews should be directed to the Chairman of your local Soil and Water Conservation District. This request letter must include a summary of the proposed project, a location map of the project site, written permission from the landowner/developer allowing the team to enter the property for purposes of review, and a statement identifying the specific areas of concern the team should address. When this request is approved by the local Soil and Water Conservation District and the King's Mark RC&D Executive Committee, the team will undertake the review. At present, the ERT can undertake two reviews per month.

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