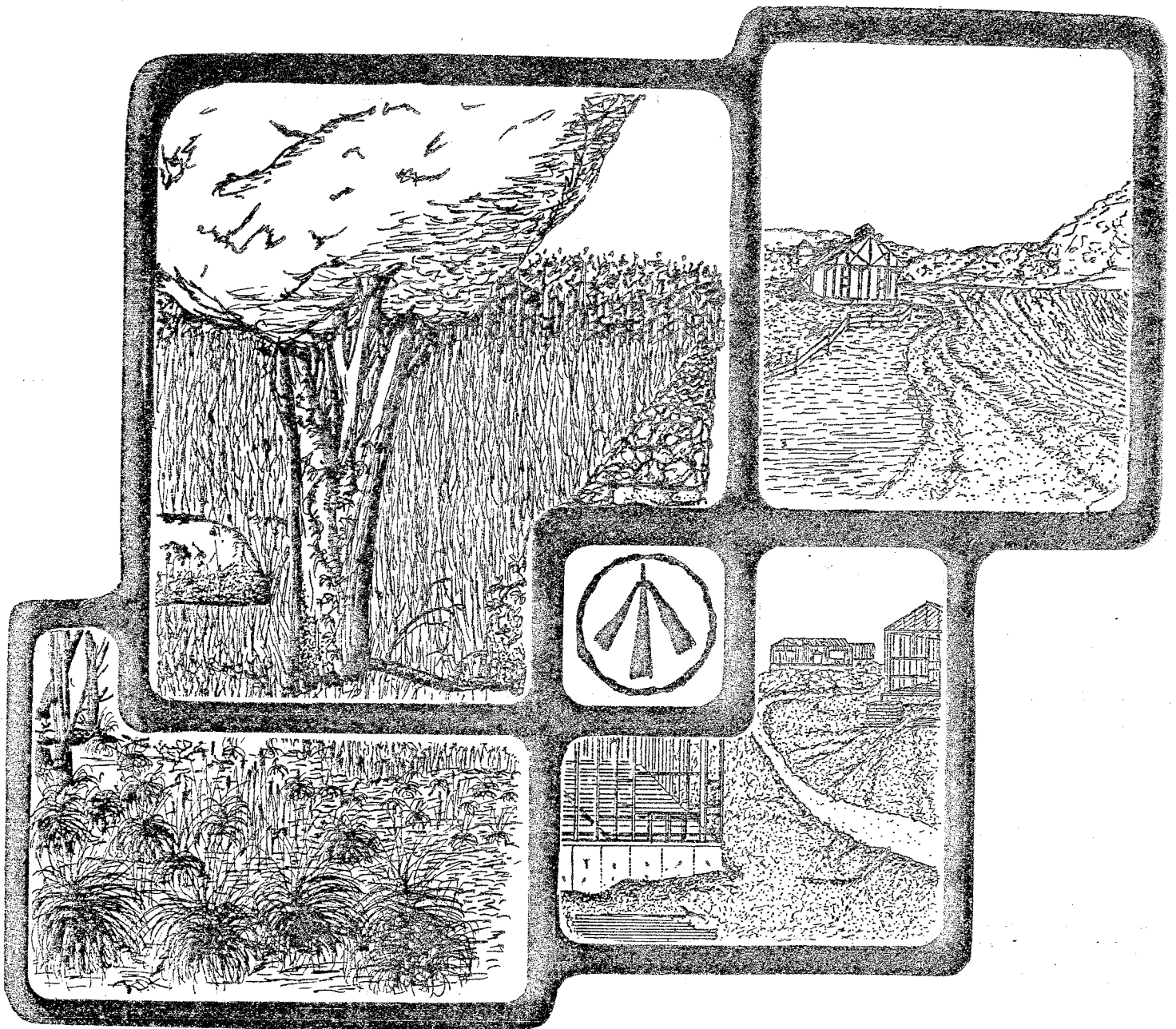


ENVIRONMENTAL REVIEW TEAM REPORT



THE MADISON RIDING CLUB PROPERTY

MADISON, CONNECTICUT

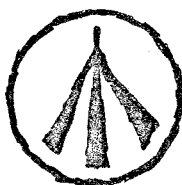
KING'S MARK

RESOURCE CONSERVATION & DEVELOPMENT AREA

KING'S MARK
ENVIRONMENTAL REVIEW TEAM REPORT

THE MADISON RIDING CLUB PROPERTY
MADISON , CONNECTICUT

AUGUST, 1982



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

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Federal Agencies

U.S.D.A. Soil Conservation Service

State Agencies

Department of Environmental Protection

Department of Health

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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

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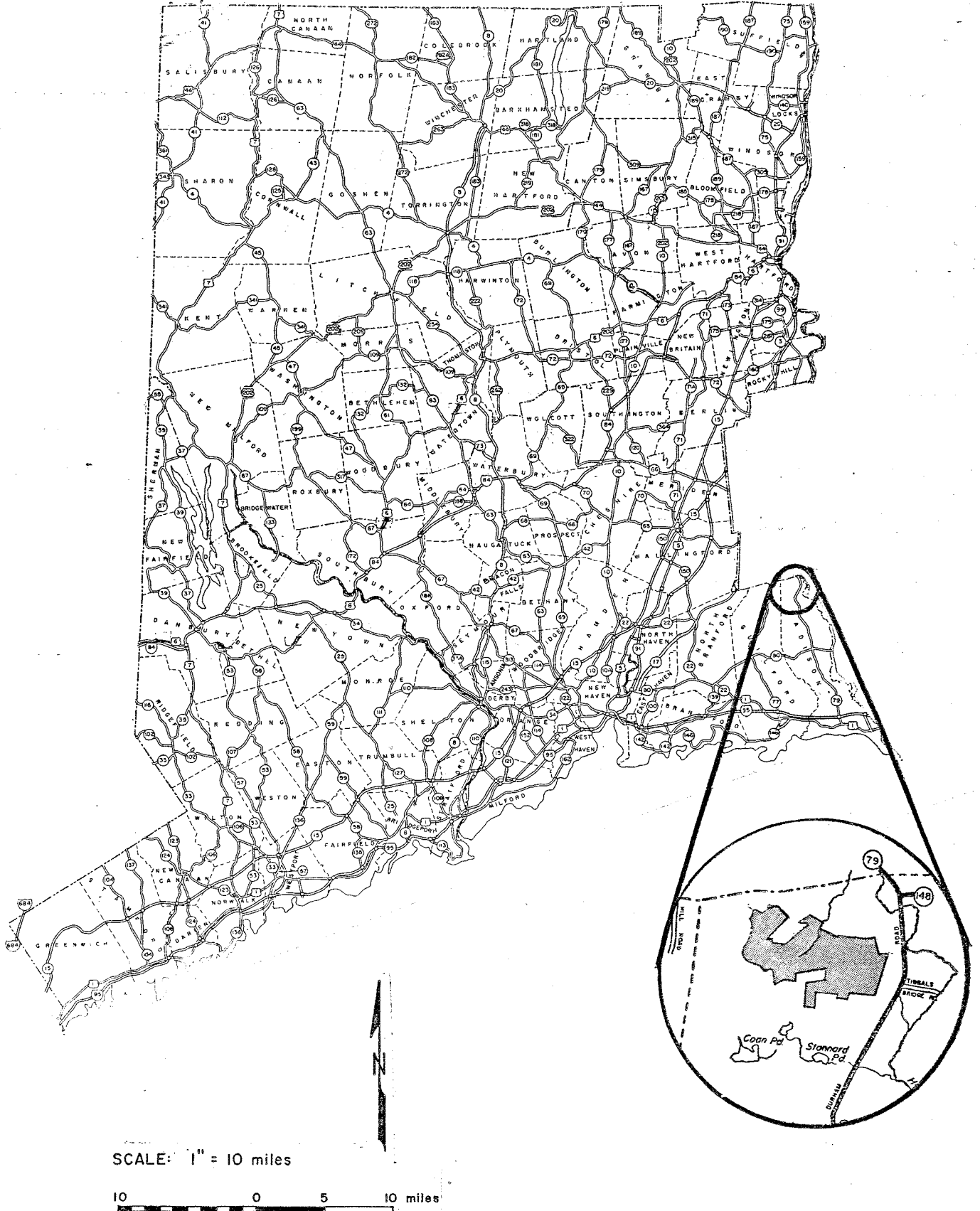
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LOCATION OF STUDY SITE



ENVIRONMENTAL REVIEW TEAM REPORT
ON
THE MADISON RIDING CLUB PROPERTY
MADISON, CT

I. INTRODUCTION

The preparation of this report was initiated by the Madison Planning and Zoning Commission. The Commission initially requested the review to become aware of the potential environmental impact of a proposed residential subdivision on the 225 acre Madison Riding Club Property. As shown in Figure 1, the subject site is located along the northern border of town just west of Route 79. Dead Hill Road forms the western border of the site. Access to the property is available off Dead Hill Road and via an easement from Route 79. The Madison Riding Club Property is wooded and characterized by moderate to steep slopes.

At the time of the ERT's field review, two conceptual development plans were before the Commission. One plan, referred to as a "conventional development proposal" called for 102 units of 1+ acre in size and 8 units of 2+ acres in size. Under this project, 67.5% (152 acres) of the site would be covered by lots, 6% (13 acres) of the site would be covered by roads, and 26.5% (60 acres) of the site would remain as open space. Under this plan, each lot would be served by an individual well and subsurface sewage disposal system.

The second proposal, known as the Green Belt Plan would create 110 lots of ½ + acre in size. This plan would allow 68.5% of the site to remain as open space. 25.5% of the site would be covered by lots and 6% (14+ acres) would be covered by roads. Under this plan, water and sewage would be provided by proposed community systems. The developers submitted proposed amendments to the Town of Madison's subdivision regulations to allow construction of the "Green Belt" proposal.

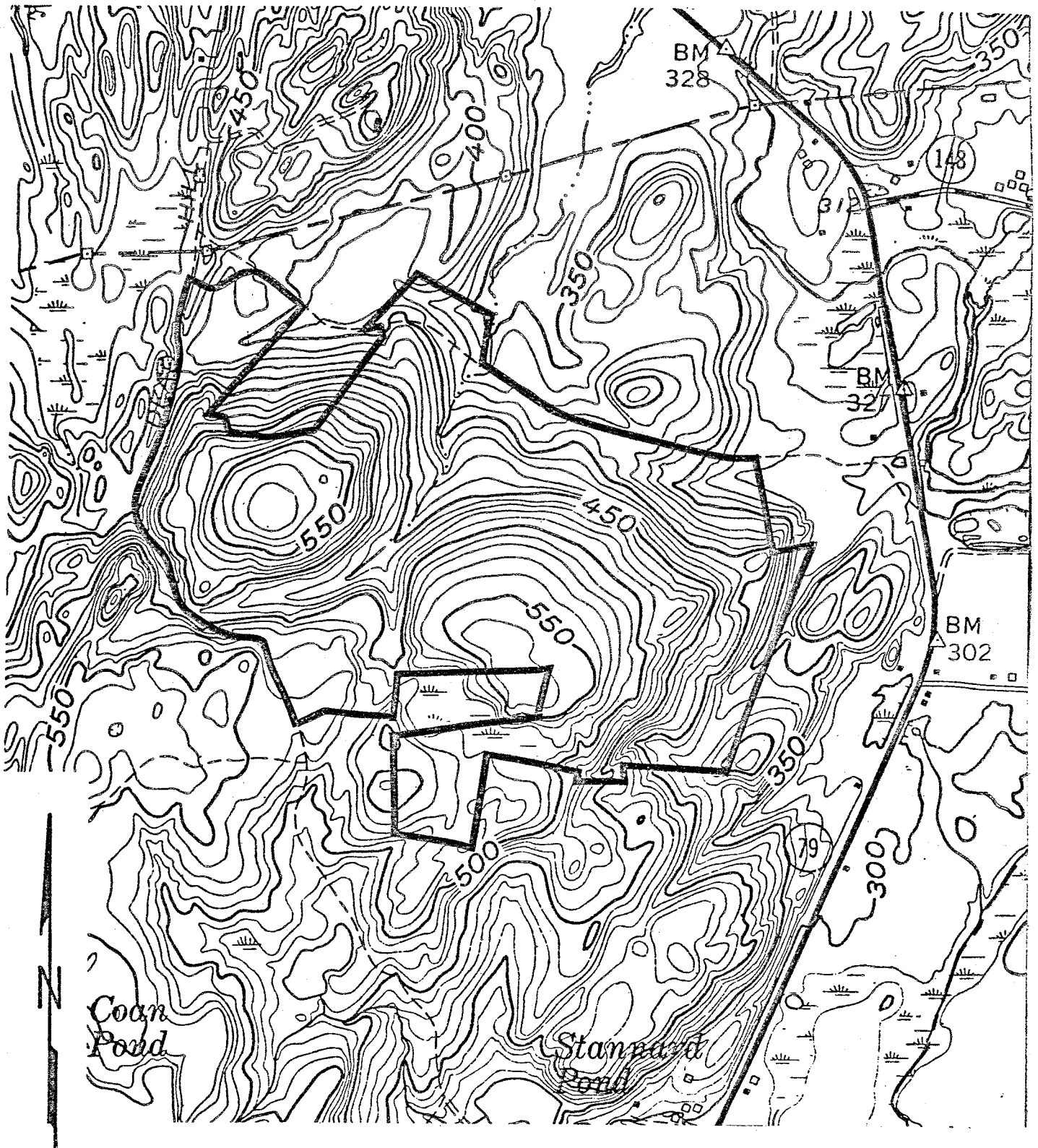
The Planning and Zoning Commission requested the assistance of the King's Mark ERT to help the town in analyzing the two alternate proposals. Specifically, the Team was asked to identify the natural resource base of the site, to comment on the suitability of the land for the alternate proposals, and to provide an objective evaluation of the potential development impact.

The ERT met and field reviewed the site on April 28, 1982. Team members for this review consisted of the following:

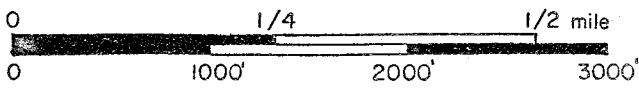
Norris Andrews.....	Planner.....	Southcentral Connecticut Regional Planning Agency
Don Capellaro.....	Sanitarian.....	Connecticut Department of Health
Tim Hawley.....	Forester.....	Connecticut Department of Environmental Protection
Frank Indorf.....	District.....	U.S.D.A. Soil Conservation Conservationist Service

FIGURE 1

TOPOGRAPHIC MAP



SCALE 1" = 1000'



Karl Lutz.....Wildlife Biologist.....Connecticut Department of
 Environmental Protection
 Andy Petracco.....Recreation Specialist.....Connecticut Department of
 Environmental Protection
 Mike Zizka.....Geohydrologist.....Connecticut Department of
 Environmental Protection

Following the ERT's field review of the site, the developer withdrew his application. A spokesman for the applicant told the ERT that the proposed project would be re-designed to provide 50-60 house lots on the property. As a result of this decision, the focus of this report is not on the two previous development proposals, but rather on the natural resource base of the site and its general suitability for residential development. Hopefully, this information will assist the town in reviewing the forthcoming application and also the developer in preparing the new plan.

This report presents the team's findings and recommendations. 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. Nor does the team recommend what ultimate action should be taken on a proposed project. The ERT concept provides for the presentation of natural resource information and preliminary development considerations--all conclusions and final decisions rest with the town and developer. It is hoped the information contained in this report will assist the Town of Madison and the landowner/developer 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. SUMMARY

1) The Madison Riding Club property is located on two rocky hills in the far northern portion of the Town of Madison. Although some sections of the property showed a surprising lack of outcrops, the Team believes that bedrock is five feet or less from the land surface over more than half of the site and less than ten feet from the surface on the remainder. The northcentral portion of the parcel showed the least amount of bedrock exposure; nevertheless, in a series of more than 60 test holes drilled in that portion of the site, half encountered rock five feet or less from the surface. The deepest hole penetrated nine feet of overburden without intersecting bedrock.

2) The occurrence of near-surface bedrock throughout the site will be a major hindrance to development. Engineered septic systems would be required in most areas, and blasting would probably be required in order to establish an internal road network.

3) It may be technically possible to create a large, conventional subdivision on this site. As a practical matter, however, it seems very likely that such a subdivision would be inordinately expensive, at least if all the proper engineering techniques were used to overcome the serious environmental limitations of the property. With the extensiveness of shallow soils and steep slopes, this parcel is unusually poorly suited to development. Nevertheless, there are some areas of relatively flat slopes and deep soils where clusters of homes might be readily accommodated. If community septic systems were placed in the pockets of "good" soil, the homes themselves could be placed in the rockier adjacent areas, since near-surface bedrock would be less of a problem for residential structures than it would be for sanitary facilities. This would probably allow for a greater number of residences on the site; in a conventional subdivision, the deep soil areas could be entirely used up by a few single-family lots.

4) The site's principal wetland areas are the narrow intermittent stream corridors. The wetland areas do not appear to have particularly unique biological or hydrological values, but they should nevertheless be preserved for their flood-storage and ecological potential.

5) Development of the site would lead to increases in runoff and, unless mitigation techniques were used, to increases in the peak flood flows of nearby streams. Due to the steepness of the slopes on this site, any plans for development should be accompanied by a stringent erosion, sediment, and runoff control plan.

6) Since no public water-supply facilities would be available to the site, any residential development would have to be served by on-site wells. The only practical source of groundwater would be the bedrock aquifer. Bedrock is typically capable of supplying small but reliable yields of groundwater to individual wells. Surveys of bedrock wells in the state generally show that 80 to 90 percent of the surveyed wells can yield at least 3 gallons per minute, an amount considered sufficient to meet the needs of most average families. Very few bedrock wells can supply more than 50 gpm, and a few yield less than 1 gpm. When several wells are drilled in an area, it is advisable to separate them by at least 300 feet to minimize the potential for mutual interference. The natural quality of the groundwater should be good.

7) The recent timber harvest on this site was done in an aesthetically acceptable manner. In the portion of the site not yet thinned, a firewood thinning in which 1/3 of the trees were removed would be desirable.

8) Wildlife is presently scarce on this property due to the recent timber harvest. Once the logging operation is completed however, and vegetation begins to grow back on the disturbed sites, the area should be greatly improved as wildlife habitat. If left undisturbed, a variety of wildlife species would return to this area. If development does occur on this site, consideration should be given to reserving portions of the site as open space. This will buffer the impact of the project on the local wildlife population.

9) The tract is large enough to accommodate a rather wide range of recreational activities. The shape, character and comparative remoteness of the tract make it well suited to passive recreational use (hiking, nature study, etc.) While active recreational use (tennis courts, swimming pools, etc.) is not ruled out for the property, it would require a greater expenditure of time and money to accommodate. The northern border of the property appears to be most suitable for development of active recreational facilities.

10) Both regional and state plans of development pinpoint this area for limited development at very low density. The site is poorly situated geographically for a high density of development due to the lack of accessibility to community services. Further, as discussed above, the site has severe limitations for development due to the physical characteristics of the land. Developing this site in excess of the carrying capacity of the land would create severe problems for the Town of Madison, and would not be in the best interests of either the potential residents or the adjacent landowners. The developers stated intention to scale down the size of the project, perhaps as much as half, appears judicious. Even a smaller scale project, however, will require considerable on-site testing and very careful planning.

III. GEOLOGY

The Madison Riding Club property is located on two rocky hills in the far northern portion of the Town of Madison. Although some sections of the property showed a surprising lack of outcrops, the Team Geologist believes that bedrock is five feet or less from the land surface over more than half of the site and less than ten feet from the surface on the remainder. The northcentral portion of the parcel showed the least amount of bedrock exposure; nevertheless, in a series of more than 60 test holes drilled in that portion of the site, half encountered rock five feet or less from the surface. The deepest hole penetrated nine feet of overburden without intersecting bedrock.

Bedrock was more prominently exposed in other areas of the site. Figure 2 shows the major outcrops either observed by the Team in the field or determined from aerial photographs. Soil maps for the site describe the soils in these areas as consisting almost entirely of Hollis-Rock Outcrop complex. (See Soils Map in Appendix.)

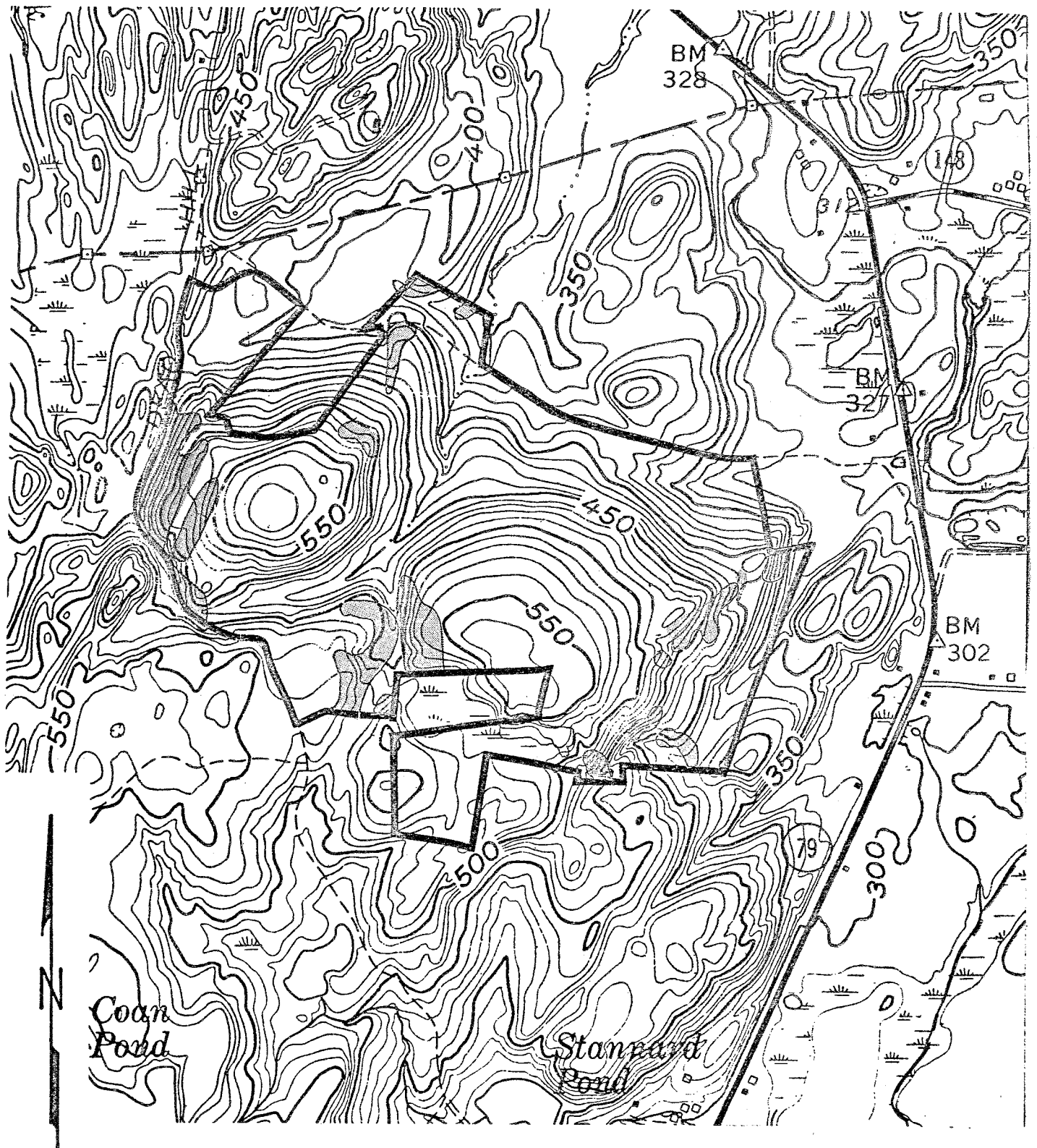
Pegmatite, a coarse-grained, quartz-and-feldspar-rich rock, constituted the majority of the outcrops seen on the property. Preliminary bedrock information for the State (Connecticut Geological and Natural History Survey Bulletin No. 84) suggests that a variety of rock types, including amphibolite gneiss, biotite gneiss and schist, feldspathic gneiss and granulite, quartzite, and garnet granulite, may in fact underlie the parcel. This is not inconsistent with the plethora of pegmatite outcrops; pegmatite may simply have intruded the "parent" rock types in a widespread series of dikes and sills. Being more resistant to weathering and erosion than many other local rock types, the pegmatite has remained as the most abundant outcrop material.

The occurrence of near-surface bedrock throughout the site will be a major hindrance to development. Engineered septic systems would be required in most areas, and blasting would probably be required in order to establish the internal road network. The differences among the various bedrock units on the site may influence the quality of groundwater to some extent: the more granular, quartz-rich and feldspar-rich rocks, such as pegmatite, may tend to produce less mineralized water than the mica-rich, structurally layered schists and gneisses. Not enough bedrock data is presently available to estimate the subsurface distribution of the various rock types.

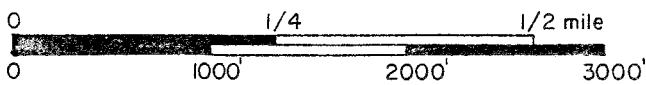
It may be technically possible to create a large, conventional subdivision on this site. As a practical matter, however, it seems very likely that such a subdivision would be inordinately expensive, at least if all the proper engineering techniques were used to overcome the serious environmental limitations of the property. With the extensiveness of shallow soils and steep slopes, this parcel is unusually poorly suited to development. Nevertheless, there are some areas of relatively flat slopes and deep soils where clusters of homes might be readily accommodated. If community septic systems were placed in the pockets of "good" soil, the homes themselves could be placed in the rockier adjacent areas, since near surface bedrock would be less of a problem for residential structures than it would be for sanitary facilities. This would probably allow for a greater number of residences on the site: in a conventional subdivision, the deep soil areas could be entirely used up by a few single-family lots.

FIGURE 2

BEDROCK OUTCROP MAP



SCALE 1" = 1000'



EXPLANATION

Areas of principal bedrock exposure, as identified in the field or from aerial photos. Does not include all outcrop areas.

The thin overburden covering the bedrock on the site is till. Till consists of a nonsorted mixture of clay, silt, sand, gravel, and boulders. These materials were collected and transported by glacial ice, which formerly occupied the region. The materials were redeposited directly from the ice, hence the lack of sorting. Most of the till is a loose, fairly sandy variety, but where the overburden is deep, a more compact till generally underlies the sandier material.

IV. HYDROLOGY

Drainage from most of the site flows north or east into tributaries of Hammonasset River. Approximately 18 acres in the western portion of the property drains northwest into tributaries of Coginchaug River. Hammonasset River flows south, emptying into Long Island Sound at Clinton Harbor, near Hammonasset Beach State Park. Coginchaug River flows north through the towns of Durham, Middlefield, and Middletown, joining Connecticut River in the latter town.

The site's principal wetland areas are the narrow intermittent stream corridors. A roughly circular, peaty wetland lies just outside the parcel in the rectangular tract within the southern portion of the property. The wetland areas do not appear to have particularly unique biological or hydrological values, but they should nevertheless be preserved for their flood-storage and ecological potential.

Development of the site would lead to increase in runoff and, unless mitigation techniques were used, to increases in the peak flood flows of nearby streams. It is not possible to assess peak-flow changes without a specific development proposal, but it is possible to compare the effects of different types of development on runoff volume increases. Since an earlier proposal offered alternative cluster and non-clustered residential development concepts, the Team has chosen to compare the effects of a standard one-acre subdivision (i.e. a subdivision wherein each residential lot is approximately one acre in size) to a clustered development wherein the same number of units would be created, but three-fourths of the land area would be saved as wooded open space. The results are shown in Table 1. Rainfall data were derived from U.S. Geological Survey publications; runoff estimates are based on S.C.S. Technical Release No. 55, with the assumption that all soils are in the "C" hydrologic class. Rainfall figures are indicated for four different storms, with each figure representing an amount that would occur within a 24-hour period.

TABLE 1. Runoff estimates for different storms in a one-acre standard subdivision and in a quarter-acre cluster subdivision with the same total land area and the same number of residential units.

	<u>10-yr. storm</u>	<u>25-yr. storm</u>	<u>50 yr. storm</u>	<u>100-yr. storm</u>
24-hour rainfall, in inches	4.5"	5.5"	6.25"	8.0"
Average runoff in inches, property entirely wooded	1.68"	2.42"	3.01"	4.4"
Average runoff in inches, one acre lots	2.38"	3.24"	3.91"	5.5"
Percentage runoff increase	42%	34%	30%	23%
Average runoff in inches, cluster development	1.94"	2.73"	3.34"	4.85"
Percentage runoff increase	16%	13%	11%	9%

As the table indicates, a cluster subdivision as discussed above would lead to far lower percentage increases in runoff. Of course, any differences from the type of clustering discussed, such as the clearing of additional wooded land for recreational facilities, would partially offset the differences in runoff from the conventional subdivision. Since the additional increment of runoff would be concentrated over a smaller area in the cluster arrangement, it would be easier to control, and therefore it would probably be less costly to design peak-flow mitigation measures. On the other hand, the very concentration of runoff would more forcefully suggest the need for erosion-control measures. Comparing the advantages and disadvantages, the cluster concept still has a significant hydrological edge over the standard subdivision concept.

V. WATER RESOURCES

Since no public water supply facilities would be available to the site, any residential development would have to be served by on-site wells. The only practical source of groundwater would be the bedrock aquifer. Bedrock is typically capable of supplying small but reliable yields of groundwater to individual wells. Surveys of bedrock wells in the State generally show that 80 to 90 percent of the surveyed wells can yield at least 3 gallons per minute, an amount considered sufficient to meet the needs of most average families. Very few bedrock wells can supply more than 50 gpm, and few yield less than 1 gpm. When several wells are drilled in an area, it is advisable to separate them by at least 300 feet to minimize the potential for mutual interference.

The natural quality of the groundwater should be good. There is potential, however, for undesirably high concentrations of iron, manganese, or sulfide in water from some wells, particularly where the bedrock tapped by the well is largely schist. Since the soils on the site are quite shallow, a serious risk of groundwater contamination by septic system effluent will accompany any large-scale development of the site. Since a cluster subdivision could use a community septic system or a few such systems, and since these systems must undergo DEP's stringent evaluation procedures before being approved, the risks from a cluster development are probably less than those that would accompany a large-scale standard subdivision. In the standard arrangement, individual systems evaluated at the local level on a less stringent basis would be spread throughout the subdivision. Failures would be less easy to control in such an arrangement, and the distribution of potential contaminants would be more extensive. Of course, individual septic failures would be less serious than a failure of a community system since the former would involve much smaller amounts of wastewater. Nevertheless, since severe limitations to septic systems exist throughout the site, the overall risk of groundwater contamination would probably be greater in the standard subdivision. A number of unnoticed, uncorrected septic problems on individual lots could pollute the groundwater as easily as a noticeable and quickly corrected failure of one large system in one location.

VI. SOILS

A detailed soils map of the site is included in the Appendix of this report together with a soils limitation chart. By comparing the soils map with the soils limitation chart, one can gain an appreciation of the general suitability of the various soils for alternate land uses.

A detailed description of each soil type mapped on the property may be found in the New Haven County Soils Survey Report, pages 8 through 68. For a thorough understanding of the soils on this site, this reference should be consulted. Copies of the Soil Survey are available from the New Haven County Conservation District (269-7509).

As noted previously, practically the entire Madison Riding Club Property is characterized by steep and shallow to bedrock soils or wetland soils. Field investigation of the site confirms the classification of the soils as mapped in the New Haven County Soil Report (see Appendix). There are, however, small inclusions of moderately deep to deep soils in between hills and along side slopes. These deeper soils are much more suitable for housing development. Due to the random and scattered distribution of these inclusions, however, backhoe excavations on each proposed lot may be necessary to find suitable areas for building and for septic systems.

It is likely that any plans for housing construction on this site will entail a considerable amount of cutting and filling. Any plans for development should therefore include provisions for the effective control of erosion and sedimentation. The New Haven Conservation District is available to assist in the preparation and review of erosion and sediment control plans.

VII. SEWAGE DISPOSAL

As municipal sewerage facilities are not available in Madison or other nearby towns, any development, for the long term, will be served by on site sewage disposal systems. It should be noted that at the present time Madison, along with a number of other area towns, is participating in an engineering sewer study. It is expected the study, which is under the aegis of the Department of Environmental Protection, will take strong direction towards a sewer avoidance program.

Based on visual observations, existing soils maps, and the findings of a number of test pits by the owner's consulting engineer, the Madison Riding Club property is not particularly favorable for sewage disposal purposes. Some areas are limited by slope and wetlands. However, the major concern or problem is one of restrictive, shallow underlying ledge rock ranging in depth between 2-5 feet. Although ledge rock was found at greater depths in some locations, the findings were sometimes spotty, with relatively limited areas of the deeper soil. It is also understood some of the deeper soil areas in lower portions of the property tend to have elevated ground water conditions, probably resulting from the upper hillside terrain.

The Public Health Code requires the bottom area of any leaching system to be a minimum of 4 feet above ledge rock and at least 1.5 feet above maximum ground water level. In general, when ledge rock is found at less than 4-5 feet below ground surface, the areas would certainly be of special concern. In particular where both on site wells and sewage systems are utilized there is greater possibility for well contamination or water quality problems. Sewage effluent may not receive adequate filtration and renovation before the sewage reaches the rock where it may enter fractures or seams, traveling to nearby wells.

Considering the quantity of sewage discharged for single family residences, one acre lots would normally be considered of sufficient size to accommodate both a well and septic system. However, where unfavorable soil conditions and/or terrain exists, considerably larger lots (i.e. lower density of development) should be provided. Also large lots themselves do not necessarily assure the availability of sufficient suitable area for sewage disposal purposes. This can only be demonstrated by adequate on-site testing.

Due to site limitations, economic considerations, and the retention of more open space area, clustering of the houses on smaller parcels would seem to have certain merits. Again, however, a major concern or question is one of locating sufficient suitable area(s) for sewage disposal purposes. Because a number of houses would be connected to a community sewage system, the volume of sewage being discharged would or could be substantial, thus necessitating the need for a sizeable disposal (leaching) area(s). As previously stated considerable on-site testing in the more favorable areas has been conducted by the applicant. In many of the areas tested, however, marginal or unsatisfactory rather than good or favorable soil conditions exist.

Design plans for a community sewage system would require the review and approval of both the Department of Environmental Protection and the State Department of Health Services. Requirements and the responsibility for the operation and maintenance of such a system would also be incorporated with the plans or permit to discharge. It is understood the local water pollution control agency would be part of any possible acceptance or approval.

In regard to a central or community water system, careful siting with provisions for maintenance of adequate separating distances from sewer lines, sewage disposal systems or other source of pollution is needed. Also adequate well(s) yield to supply water for the intended number of dwellings would be necessary. Community water systems are to be reviewed and approved by the Water Supplies Section of the State Department of Health Services.

Overall, due to a number of limiting factors including the fact that the property is located on a public water supply watershed (serving Hammonasset Reservoir), detailed engineering along with careful planning and evaluation of any development on this site is of paramount importance.

VIII. VEGETATION

The Madison Riding Club Property is entirely forested with a mixture of pole-size (5-11 inches in diameter) black oak, red oak, white oak, red maple, and black birch. The understory ranges from completely open to dense patches of mountain laurel, huckleberry, and maple-leaf viburnum. Ground cover is generally sparse, although patches of grass, sedge, and ferns do occur.

Tree density ranges from 30 per acre (where recent timber harvesting was heavy) to over 300 per acre (where no harvesting was done). The high density areas need to be thinned for firewood if a vigorous forest stand is desirable for the future.

Aesthetic Considerations:

The recent timber harvesting was done in an aesthetically acceptable manner. Many of the remaining pole-size trees were not damaged. The patches of mountain laurel on the property have high aesthetic potential. This potential however cannot be fully realized unless tree cutting is done to give the laurel more sunlight.

Parts of the site would have panoramic views of the surrounding hills and valleys if more trees were removed. Alternatively, some of the site's neighbors would have a clear view of part of the subdivision if the trees were cut.

Limiting Conditions and Potential Hazards:

Trees are sensitive to changes in soil depth, and may die three to five years after disturbance. Grading or filling will be necessary on much of the site due to steep slopes. Trees growing in locations subject to altered grade should be removed. Also dead trees near proposed utility lines or structures will pose a hazard and should be removed.

In the portions of the site not yet thinned, a firewood thinning in which 1/3 of the trees were removed would alleviate crowding and give the remaining trees room to extend their crowns and root systems. This would reduce mortality in the forest and make some of the trees better candidates for shade trees. A forester should be hired to mark the trees to be removed so that aesthetic and ornamental values can be maximized. Such a thinning would yield about 5 cords per acre for the 100 + acres not cut previously. The harvesting could be done when road right-of-ways are cleared.

Diseased or poorly-formed residual trees in the areas previously harvested should be removed. Growth of the new forest will be most rapid in full sunlight. Clearcut openings 0.25 - 2.0 acres in size may enhance aesthetics, if located properly. This, too, is a job best done by a forester.

IX. WILDLIFE

Because the area is temporarily being disturbed by the on-going logging operation, wildlife is scarce on this area. Most of the unlogged sites are not good wildlife areas except for the groves of evergreen mountain laurel on the knolls and possibly the rocky ledges. The stands of pole sized trees are not old enough to produce food and are growing too close together to allow sunlight to reach the forest floor, which would produce a more desirable understory growth for wildlife. Also, there is a shortage of snag trees (dead and dying trees used by many wildlife species as feeding, nesting, and perching sites).

However, since many of the overstory trees have been removed on the logged area, a great deal more sunlight will reach the forest floor, encouraging a lush understory, which will benefit wildlife as food and cover. The remaining trees will have more room to grow and will be healthier in the long run. These trees should start producing a heavier mast crop (fruits, nuts, berries, etc.) which is utilized by wildlife as food.

After the logging operation is completed and vegetation begins to grow back on the disturbed sites the area should be greatly improved as wildlife habitat. If left undisturbed, a variety of wildlife species would return to this area.

If development does occur on this site, consideration should be given to reserving portions of the site as open space. This will buffer the impact of the project on the local wildlife population.

Trees being saved during the construction phase should be protected from mechanical injury and root damage from heavy equipment. This can be done by placing a mechanical barrier extending from the tree trunk out to the drip line. Trees suffering from mechanical or root damage may take as long as seven years to die. Landscape vegetation should be of a variety that attracts wildlife. Clumps or small islands of vegetation are best for wildlife.

After the development process, sound forest and wildlife management of the reserved open space would greatly benefit the forestry and wildlife resources and may offset the loss of habitat. Technical assistance is available from the Wildlife Bureau of DEP (295-9523).

X. RECREATION

The 225+ acre parcel reviewed by the Team is hilly, wooded and has undergone a recent logging operation. The shape, character, and comparative remoteness (from population centers) of the tract make it well-suited to passive recreational use. While active recreational use is not ruled out for the property, it would require a greater expenditure of time and money to accommodate. The relative lack of level terrain, the access limitations, and the management goals of its owner are some factors to be considered in determining appropriate uses of the property.

The present access to the tract is via state route 79, thence turning onto a rather narrow and winding town road, thence into the property over an unimproved gravel road. Any high volume uses to which the property might be put would have to take into account the comparatively poor access and the impact increased traffic volumes would have on residents along that route. Those considerations would of course be ameliorated if direct access to the property from Route 79 was provided.

From the standpoint of a "recreational-use-only" plan for the tract, any active recreation facilities would most logically be located along the access road on the northerly part of the property. The most gentle terrain is located here which will minimize the amount of site disruption (via cut and fill) necessary to install any structures or tennis and basketball courts, associated parking areas and similar facilities requiring level terrain. Construction of additional roads providing access to facilities would be minimized as well. A minimal improvement for public use of the property would be an upgrading of the existing gravel road and the providing of parking space.

If the property were developed for housing and provision was made for greenbelts and recreational facilities (e.g. swimming pool, tennis courts, etc.) these would be attractive features but would necessarily incur some additional cost per residential unit. For the purposes of this report, only a plan of "recreation-use-only" will be discussed. The information can be adapted to plans for residential development however.

Some possible combinations of recreation uses requiring minimal modification of the property are:

- 1) Hiking trails - routed around and over the higher hillocks.
- 2) Nature study - in conjunction with footpath use.
- 3) Horseback riding.
- 4) Snowshoe and cross-country ski use of the moderate (less steep) paths during snow cover.
- 5) Backpack camping - where everything packed in is packed out, requiring little, if any, maintenance.

- 6) Picnicking - since parking space, tables and toilets must be provided, this activity is more involving and requires ongoing maintenance (garbage pickup, toilet servicing, and associated work such as table and toilet repairs and removal of dead trees or overhanging dead limbs which pose a safety hazard.)
- 7) Hunting - an activity which necessitates well-marked property boundaries if at odds with those activities permitted on adjacent lands. Well-defined property bounds are desirable in any case.

Some possible combinations of facilities for the property requiring considerable site modification are:

- 1) Tennis and basketball courts.
- 2) Swimming pool(s) - water supply the most limiting factor here.
- 3) Horse stables - tree clearing for pasture and building erection would be necessary.
- 4) Miniature golf course.
- 5) Site camping - drive to areas.
- 6) Sledding and tobogganing - laneway clearance (tree removal) on a hillside would be necessary.
- 7) Ballfield - potentially the most disruptive use since a large, level area is needed, requiring extensive cutting and filling.
- 8) Skeet, trap, and or archery range - this activity should be considered separately and not in combination with other activities in close proximity.
- 9) B.M.X. course - making use of the smaller hillocks. This is bicycle racing on a closed course and it closely resembles motorcycle "moto-cross" competition.

The above list of facilities and activities is not comprehensive nor is it necessarily the ideal combination. It is merely a range of options which the property could lend itself to. The use of one activity may preclude the use of another because of terrain or area limitations. If zones of use are established on the tract, the heavy use area should probably be the more accessible and gently sloping north portion, while the more passive, trail related uses would be more suitably located along the southern portion.

Trail activities can make use of existing paths and the new log skidding roads. Very steep or very wet routes should be bypassed to minimize erosion potential. Selective tree removal can provide vistas from the higher ground but such cutting must be done with care and economy to minimize aesthetic

disruption and erosion potential on steep slopes. Creating openings and particularly a laneway on a hillside slope would, as previously indicated, enhance the possibilities for sledding, tobogganing, and downhill skiing. Further enhancement of the possibilities for recreation use of the property could be via permission from abutting landowners to extend hiking, bridal, etc. trails onto and over their properties.

If the property is not developed in the near term, it would be desirable to keep it available to local people for passive recreation use since it is part of a sizeable block of open space land. If no user fees are charged, the landowner is protected from user lawsuits by the Landowner Liability Law.

XI. ADDITIONAL PLANNING CONSIDERATIONS

The proposed site for the North Madison Riding Club residential development is in the "Rockland" section of North Madison. As discussed previously, this name is most appropriate for the area of the proposed development. Both regional and state plans of development pinpoint this area for limited development at very low density.

The site is approximately 12 miles from the center of Madison, 7 miles to the nearest school, 5 miles to the North Madison Volunteer Firehouse, and 5 miles to the nearest stores.

The proposed site is topographically and geologically unsuitable for a high density conventional subdivision. The cost of roads and the preparation of the land for individual parcels would be exorbitant and the ultimate cost of maintenance would be exceptionally high.

The proposed revision to the subdivision regulations, as submitted under the previous development proposal, has been interpreted to mean that the total number of dwelling units allowed on the site would be based on the preparation of a conventional subdivision plan. Strict interpretation of the regulations would indicate that such a subdivision plan would require testing of each lot for on-site sewage disposal and water supply rather than a rule of thumb determination of the total number of dwelling units allowed based on a simple division of the lot size per the zoning regulations and the total size of the parcel. It appears clear that even under the best of circumstances a much smaller number of units would be approved based upon satisfactory on-site testing than would be allowable under the density permitted in the zoning regulations.

With the physical limitations of this site, clustering of units is the only practical source open to the developer for a relatively high density development. The total number of dwelling units should, however, be a function of the accessibility of the development to community services, including schools and public safety facilities such as fire and police.

To conclude, the Madison Riding Club Property is poorly situated geographically for a high density development. In addition, the physical site limitations are severe for residential development. The developers stated

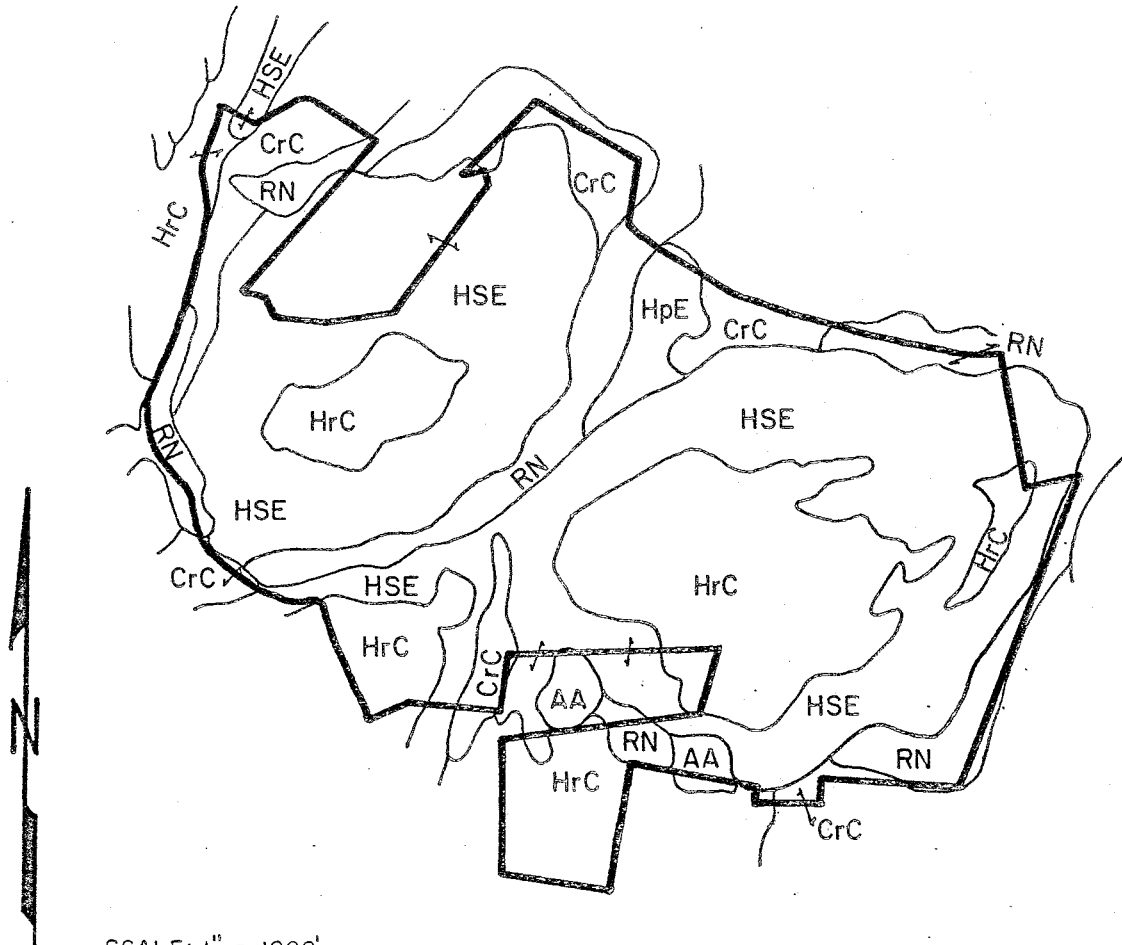
intention to scale down the size of the project, perhaps as much as half, appears judicious. Even a smaller scale project however, will require considerable on-site testing and very careful planning. Developing this site in excess of the carrying capacity of the land would create severe problems for the Town of Madison, and would not be in the best interests of either the potential residents or the adjacent lands (particularly to the south, much of which is devoted to water supply).

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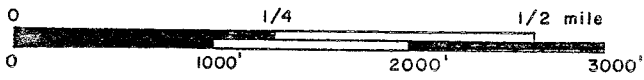
XII. APPENDIX

Soils Map
Soils Limitation Chart

SOILS MAP



SCALE: 1" = 1000'



ADAPTED FROM NEW HAVEN COUNTY
SOIL SURVEY, U.S.D.A. - S.C.S.

SOILS LIMITATION CHART - MADISON, CONNECTICUT

MAP SYMBOL	SOIL NAME	SEPTIC SYSTEMS	BLDG. W/BASEMENTS	ROADS OR DRIVEWAYS	LANDSCAPING
HSE	Hollis-Rock outcrop complex, 15-35% slopes	Severe; Slope, Depth to rocks, Large stones	Severe; Slope, Depth to rocks, Large stones	Severe; Slope Depth to rocks, Large stones	Severe; Slope Depth to rocks, Large stones
HrC	Hollis-Rock outcrop complex, 3-15% slopes	Severe; Depth to rock, Large stones	Severe; Depth to rock, Large stones	Severe; Depth to rock, Large stones	Severe; Depth to rock, Large stones
AA	Adrian and Palms mucks	Severe; Wetness, Floods	Severe; Wetness, Excess humus	Severe; Wetness, Frost action, Low strength, Excess humus	Severe; Wetness, Excess humus
RN	Ridgebury, Leicester, and Whitman extremely stony fine sandy loams	Severe; Wetness Large stones	Severe; Wetness Large stones	Severe; Wetness Frost action	Severe; Wetness Large stones
CrC	Charlton-Hollis fine sandy loams, 3-15% slopes	Severe; Large stones, Depth to rock	Severe; Large stones, Depth to rock	Moderate-Severe; Large stones, Depth to rock	Severe; Large stones
HpE	Hollis-Charlton fine sandy loams, 15-35% slopes	Severe; Slope, Depth to rock, Large stones	Severe; Slope, Depth to rock, Large stones	Severe; Slope, Depth to rock, Large stones	Severe; Slope, Depth to rock, Large stones

EXPLANATION OF RATING SYSTEM:

- SLIGHT LIMITATION: indicates that any property of the soil affecting use of the soil is relatively unimportant and can be overcome at little expense.
- MODERATE LIMITATION: indicates that any property of the soil affecting use can be overcome at a somewhat higher expense.
- 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.