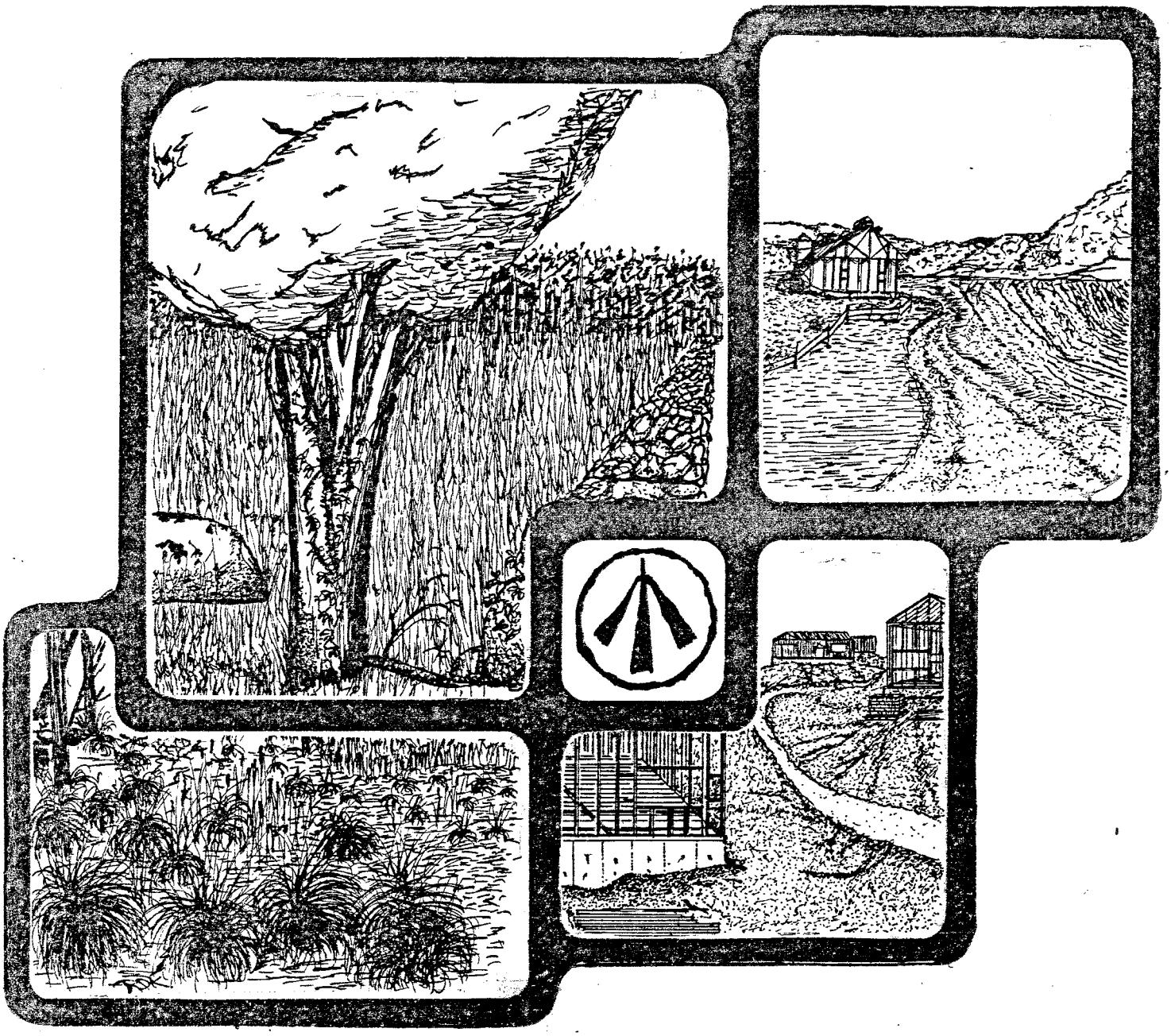
ENVIRONMENTAL REVIEW TEAM REPORT



PROPOSED CORPORATE OFFICE PARK ZONE
MADISON, CT

KING'S MARK
RESOURCE CONSERVATION & DEVELOPMENT AREA

KING'S MARK
ENVIRONMENTAL REVIEW TEAM REPORT

PROPOSED CORPORATE OFFICE PARK ZONE
MADISON, CT
AUGUST 1984

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

ACKNOWLEDGMENTS

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

Federal Agencies
U.S.D.A. Soil Conservation Service

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

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

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FUNDING PROVIDED BY
State of Connecticut

POLICY DETERMINED BY
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Jamie Whitman, ERT Cartographer
Jamie Whitman, Secretary

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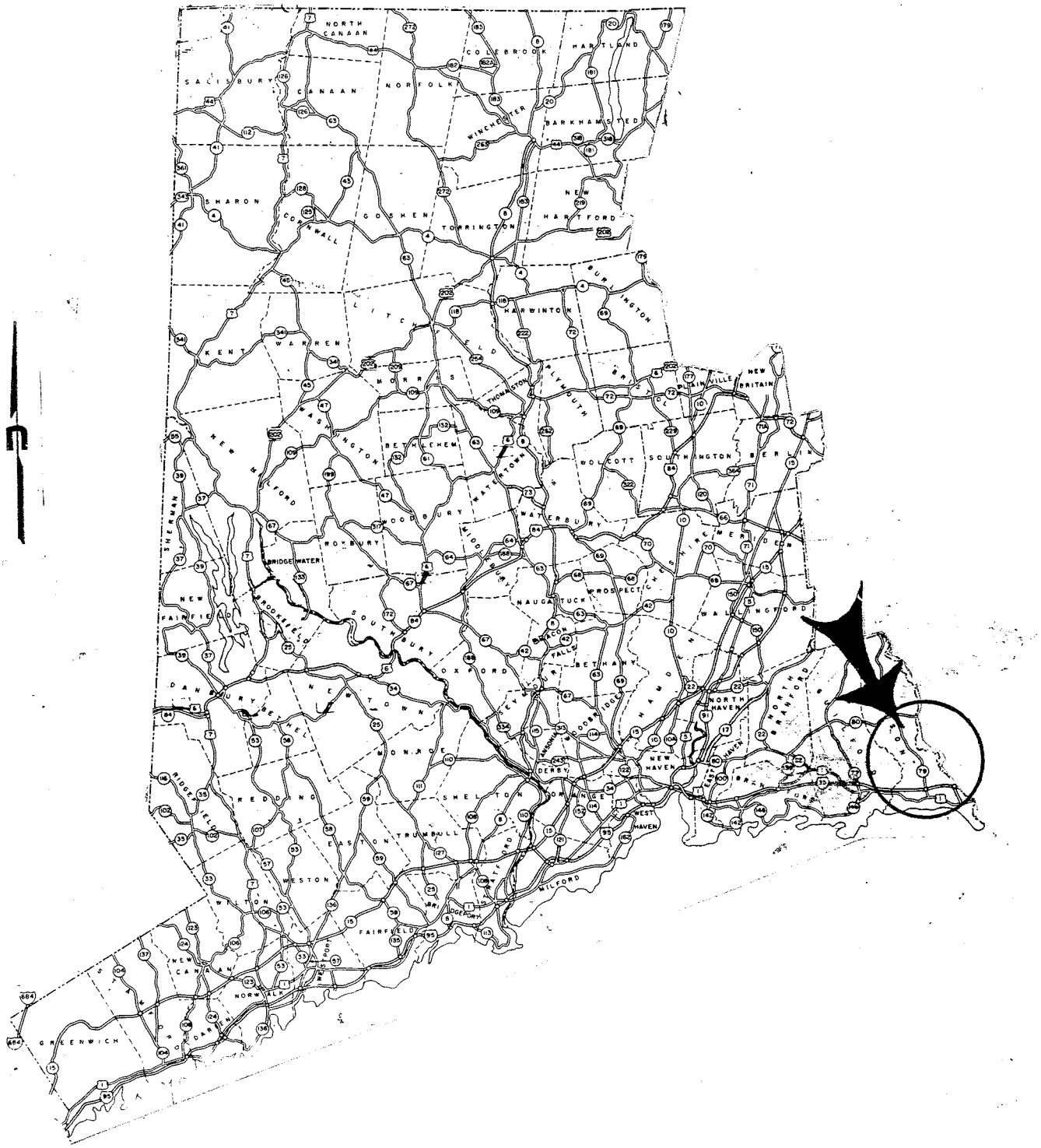


Scale 1" = 10 miles

10 0 5 10 miles

ENVIRONMENTAL REVIEW TEAM REPORT
ON
PROPOSED CORPORATE OFFICE PARK ZONE
MADISON, CT

I. INTRODUCTION

This report on the environmental suitability of a proposed zone change in the Town of Madison was requested by the Madison Planning and Zoning Commission.

The zone change is being proposed by the Madison Planning and Zoning Commission and would rezone approximately 260 acres in town from R-1 and Ru-2 (residential) to corporate office use. The following uses would be permitted, subject to a special exception permit, under the proposed regulations: 1) executive or administrative offices; 2) research laboratories; and 3)accessory uses customary with and incidential to the permitted uses.

The subject area is located about one mile northwest of the center of town. Access to the area is available from the east off Copse Road and Rte. 79. The Penn Central Railroad abuts the southern border of the tract and I-95 bisects the site. As shown in Figure 1, the land is mostly flat and consists of a considerable amount of wetland.

The Madison Planning and Zoning Commission requested this environmental review to learn more about the land and its suitability for the proposed use. Specifically, the ERT was requested to: 1) provide a natural resource inventory and evaluation of the area; 2) discuss the suitability of the land for corporate office park use; 3) identify any adverse environmental impacts which might result from the proposed use, and 4) discuss any mitigating measures which could be employed to lessen the severity of any negative impacts.

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 March 27, 1984. Team members participating on this review included:

Marc Beroz	Soil Scientist	U.S.D.A. Soil Conservation Service
David Lord	District Conservationist	U.S.D.A. Soil Conservation Service
Richard Lynn	ERT Coordinator	King's Mark RC & D Area
William Warzecha	Geohydrologist	CT Department of Environmental Protection
Carolyn Westerfield	Regional Planner	South Central Connecticut Regional Planning Agency
Janet Wilscam	Biologist	CT Department of Environmental Protection

FIGURE 1
TOPOGRAPHIC MAP

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

This report presents the team's findings. The report identifies the natural resource base of the property and discusses opportunities and limitations for corporate office park use. It is hoped the information contained in this report will assist the town in making environmentally sound decisions.

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

* * * * *

II. HIGHLIGHTS

1. *The four types of surficial geologic materials found within the tract include outwash (sand and gravel), till, swamp sediments, and artificial fill. Outwash sediments cover approximately 90 percent of the site. Overlying approximately 50 percent of the outwash sediments on the tract are swamp sediments. (p. 8)*

2. *From a geological standpoint, it appears that the land north of I-95 has the best potential for development of a corporate office park. Because wetlands comprise a major portion of the land west of the Grove School, it seems likely that development in this area would only be appropriate at a comparatively low density. Besides wetlands, another limiting factor with regard to development behind the Grove School is the existence of soils in certain areas with a seasonally high ground water table. (p. 8)*

3. *Development of the site can be expected to lead to increases in storm water runoff. These increases will result mainly from covering highly permeable sand and gravel soils with impervious surfaces. Because these increases may be significant,it is strongly recommended that a detailed engineering study of the pre- and post development runoff for the entire site, as well as a careful stormwater management plan, be prepared prior to any development. (p. 10)*

4. *Approximately 50 percent of the subject parcel is occupied by regulated wetlands. Wetlands serve many hydrological and ecological functions and, therefore, wetland disturbance via modification, filling, etc., should be avoided where possible. The western parts of the subject parcel are subject to flooding during a 100-year storm event. (p. 12)*

5. *According to a town official, if a corporate office park was developed on the parcel, a public water supply line would be extended to serve prospective users of the park. Nevertheless, if an individual on-site well or wells were desired to supplement the public water facilities, it is possible that outwash deposits (sand and gravel) in the eastern half of the site north of I-95 may have potential for a high yielding well or wells. It may be worthwhile to drill an exploratory well or wells in this area to determine the aquifer potential of the outwash deposits. The quality of groundwater at the property should be satisfactory. (p. 12)*

6. *Approximately half of the study area is composed of wetlands which have poor potential for urban development. As discussed in the text of this report, the non-wetland soils on the site vary in their suitability for the proposed land use. A major concern is the fast permeability of the sandy and gravelly soil which may not adequately filter septic effluent. This could result in groundwater contamination. Limitations for buildings and roads on the non-wetland soils vary from slight to severe depending on slope, depth to bedrock, and depth to a seasonally high water table. (p. 17)*

7. *Several of the map units within the study area qualify as Prime Farmland or Additional Farmlands of Statewide Importance. Portions of this site are presently being farmed. In addition, there is a vegetable truck farm in operation along Copse Road. With the closeness it has to a large population-market area, its preservation should be considered. (p. 19)*

8. *The non-wetland soils mapped on this site vary from sandy to fine sandy loams. This type of soil has very little cohesiveness and hence is very susceptible to soil erosion and sedimentation. With the complex pattern of wetland and non-wetland areas on this site, adequate erosion and sediment control planning and implementation is vital if the wetlands are to be protected. (p. 17)*

9. *The area of the proposed zone changes includes s e v e r a l areas that are significant in terms of wetland resources, vegetation associations, and wildlife value. Game Farm Pond, the man-made pond near Grove School, the duck pond on the south side of Woodland Road, and the shrub wetland located to the west of Concord Meadows Condominiums are particularly noteworthy. Special measures should be implemented to preserve and enhance these areas in the face of anticipated development.(p. 19)*

10. *The text of this report outlines a number of measures to mitigate impact of the proposed project on vegetation and wildlife resources. Among these are: 1) avoiding development around Game Farm Pond, the swimming pond, the alder swamp, and the duck pond; 2) consider preserving and managing one of the open fields off Copse Road as open space; 3) provide buffer strips around pond and wetland areas, and 4) encourage a cluster zoning scheme to concentrate development in upland areas while avoiding wetlands. (p. 26)*

11. *Existing development within the site boundaries, approved residential development plans, construction limitations due to soil and drainage conditions and lack of readily available access to buildable acreage severely limits the development potential of the land south of I-95 in the opinion of the Team's Planner. Of the remaining acreage, that north of I-95, much is in wetlands, leaving about 40 + acres for non-residential development. While there should be no conflict of use with the High School to the north, other adjacent land use development and winding local roads are decidedly low density in nature. If this site is to be rezoned for non-residential use, the Town should seriously consider undertaking measures to insure that: 1) any development will be compatible with the neighborhood, 2) access to and from the site is satisfactory, and 3) traffic generated will not exceed the carrying capacity of the access road. (p. 28)*

III. TOPOGRAPHY AND GEOLOGY

A. Topography

Most of the land surface throughout the site is characterized by a combination of relatively flat and gently undulating slopes, which are controlled largely by those unconsolidated materials overlying bedrock. The eastern limits of the parcel contain some sharply defined bedrock controlled knolls. Maximum and minimum elevations within the parcel are 60 feet and 20 feet above mean sea level, respectively.

Based on a soils map prepared by the Team's soil scientist, approximately half of the site comprises wetlands. Wetland soils are delineated on the accompanying soils map (see Figure 6) as Sr (Scarboro muck), Aa (Adrian and Palms mucks), Ce (Carlisle muck) and Ru (Rumney soils).

The principal watercourse on the site is an unnamed tributary of the Neck River which flows through a wetland in the northern parts of the parcel. Major surface water bodies found on the parcel includes a portion of Game Farm Pond at the western border as well as another man-made pond just east of it.

B. Geology

The proposed corporate office park zone is located in an area that is encompassed by the Clinton topographic quadrangle. A bedrock geologic map (QR-29, by L. Lundgren, Jr., and R.F. Thurrell) and a surficial geologic map (QR-28, by R.F. Flint) have been published by the U.S. Geological Survey.

Bedrock Geology

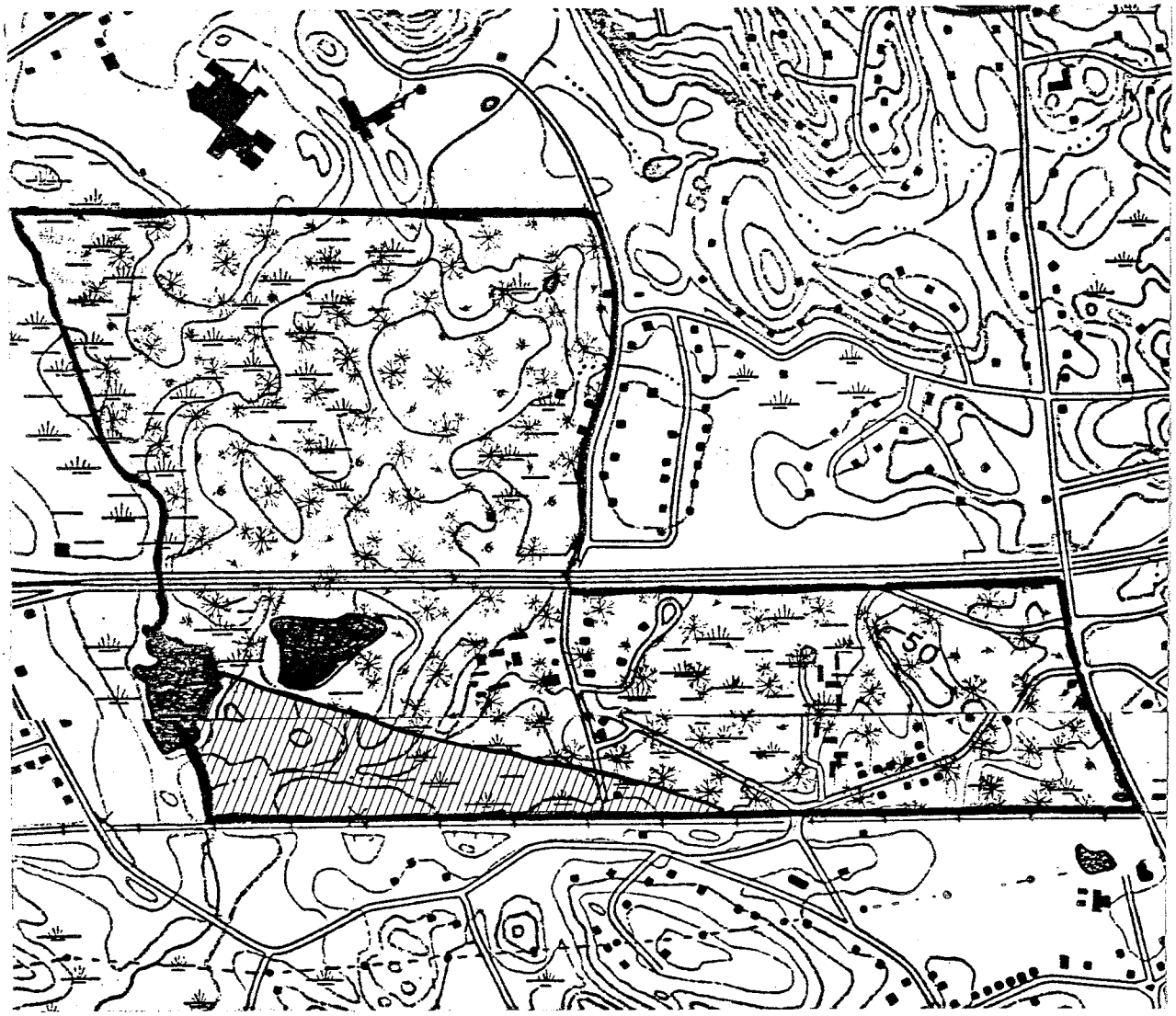
Bedrock outcrops only in the eastern limits of the parcel. Map QR-29 identifies two major rock formations within the parcel. A subunit of the Middletown Gneiss underlies or crops out on most of the tract while a subunit of the Monson Gneiss underlies approximately 12 percent of the site (see Figure 2). These rocks are metamorphic; that is, crystalline rocks which formed under conditions of great heat and/or pressure.

The Monson Gneiss subunit consists of a dark hornblendic-plagioclase-quartz gneiss with black amphibolite layers. The term "gneiss" refers to rocks that are composed of flaky, platy or elongate minerals which alternate with granular minerals giving the rock a banded appearance. "Amphibolites" refer to rocks consisting mainly of the amphibole minerals amphibotic (hornblende) and plagioclase.

The Middletown Gneiss subunit consists of interbedded biotite schists and calc-silicate gneisses. "Schists" are classified as rocks whose aligned mineral layers are abundant, which give the rock a slabby appearance. The gneisses and schists in this rock unit grade into one another and may be seen together in a single exposure. The adjective "calc-silicate" preceding "gneisses", above, refers to rocks rich in the major rock forming minerals silicates and calcium.

Depth to bedrock ranges from zero, where bedrock outcrops in the eastern limits of the property to probably not more than 80 feet in the central and

FIGURE 2
BEDROCK GEOLOGY



Middletown Gneiss member

Monson Gneiss member

see text for bedrock descriptions

N

SCALE

1" = 1000'

east-central sections of the site.

Surficial Geology

Surficial geologic materials refer to unconsolidated rock particles, organic matter, or manmade materials that overlie solid bedrock. They are also referred to as "overburden". The four types of surficial geologic materials found within the tract include outwash (sand and gravel), till, swamp sediments, and artificial fill (see Figure 3).

According to QR-28, outwash sediments cover approximately 90 percent of the site. "Outwash sediments" consist chiefly of stratified sand and gravel which were "washed out" from the glacier ice by meltwater streams. They were deposited in front of or beyond the active glacier. Thicknesses of the outwash deposits probably range from a few inches at the till-stratified drift contact in the eastern part of the tract to not more than 80 feet in the central and east central sections of the parcel. Based on a log of test holes drilled within the parcel, mainly along I-95, depths ranged between 19.5 feet and 46.5 feet.(Source: Connecticut Water Resources Bulletin #30).

Overlying approximately 50 percent of the outwash sediments on the tract are swamp sediments. These sediments consist of silt, sand and clay mixed with organic material in poorly drained areas.

Another glacial sediment found within the parcel, which covers only about 15 acres or 5 percent of the land is till. Till consists of nonsorted, nonstratified rock particles and fragments. It was deposited directly from glacier ice without subsequent re-working by meltwater streams. The upper few feet of till is commonly sandy, stony and friable; at depth it becomes siltier and more tightly compacted. The thicknesses of the till on this site are generally thin,ranging from zero where rock outcrops, to probably not more than 10 feet throughout the remainder of the area it covers.

The final type of surficial deposit found on the parcel is artificial fill. Artificial fill consists of subgrade material placed by man for the construction of I-95 and Copse Road, as well as the outlet control structure for Game Farm Pond.

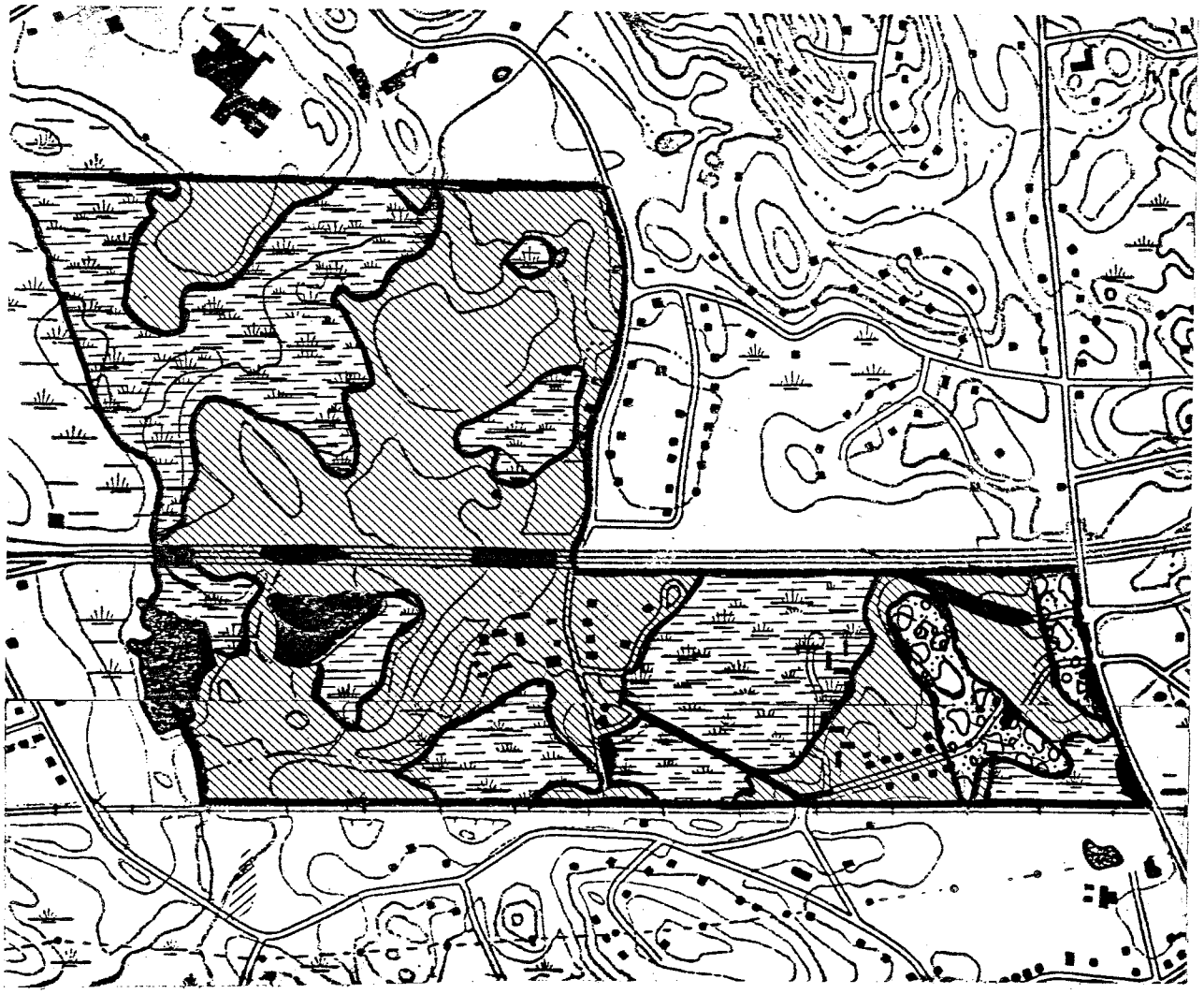
Geologic Development Concerns

In terms of the proposed corporate office park, the Team focused its attention mainly on the land west of the Grove School and on the north side of I-95. This area is covered primarily by outwash deposits (sand and gravel which range from less than 10 feet to probably not more than 40 feet) and swamp sediments. Since there is no public sewer system serving the town, potential users of the park would probably have to be serviced by individual on-site sewage disposal systems. A town official indicated it is likely a public water supply line would be extended to service the proposed park.

From a geological standpoint, it appears that the land north of I-95 has the best potential for development of a corporate office park.

Because wetlands comprise a major portion of the land west of the Grove School, it seems likely that development in this area would only be appropriate at a comparatively low density. Besides wetlands, another limiting factor

FIGURE 3
SURFICIAL GEOLOGY



Outwash deposits

Swamp deposits

Artificial fill

Till

N

SCALE

1" = 1000'

with regard to development behind the Grove School is the existence of soils in certain areas with a seasonally high ground water table. These areas are found adjacent to wetland areas, near streams and/or surface water bodies, or in areas where the excavation of sand and gravel has nearly encountered the ground water table, such as in the vicinity of Game Farm Pond. These limitations (i.e., wetlands, seasonally high ground water table) will weigh most heavily on the ability to provide adequate subsurface sewage disposal. This consideration is discussed in more detail in Section VII of this report.

IV. HYDROLOGY

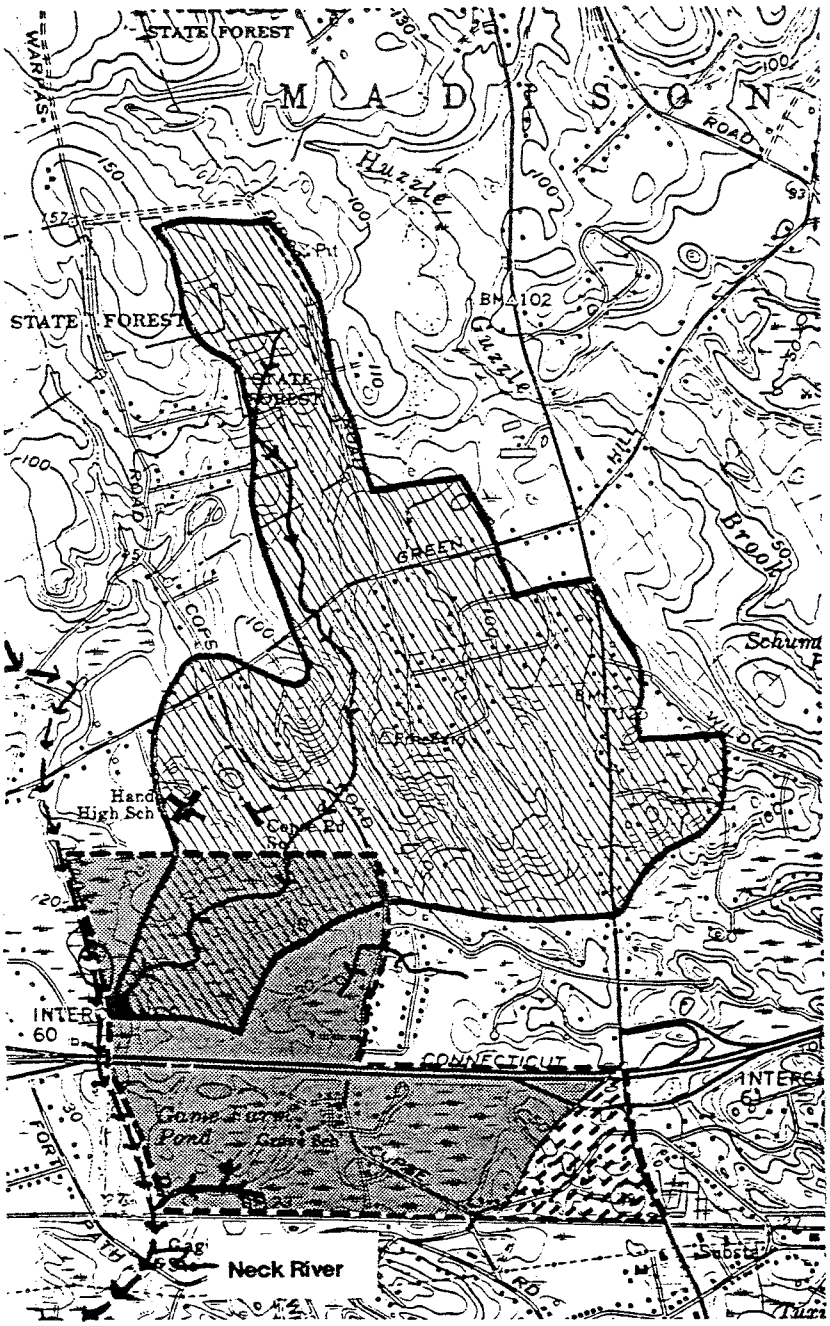
For the most part, the Neck River forms the western boundary line of the subject parcel. An unnamed tributary of Neck River and its accopanying wetlands passes through the northern limits of the site. Another wetland, in the southcentral portion of the tract, drains generally westward into an intermittent stream which discharges to the Neck River just southeast of Game Farm Pond. Most surface runoff from the site is collected by the watercourses mentioned above. A small portion of the property in the eastern limits is drained by intermittent drainage channels flowing southerly to Long Island Sound (see Figure 4).

Two surface water bodies, Game Farm Pond and an unnamed recreational pond used by the Grove School are found in the western portions of the tract. Game Farm Pond is an impoundment of the Neck River while the recreational pond was created as a result of intercepting the ground water table during sand and gravel excavation.

Development of the site can be expected to lead to increases in storm water runoff. The amount of increased runoff will depend largely on the density of the proposed corporate office park, extent of development, amount of vegetation removed, the amount of impervious surface created (e.g., roof tops, paved roads, parking areas) and the timing of development on each lot. Since large parking facilities and buildings are often associated with corporate office park development, the potential for a significant increase in runoff is greater than would be the case for, say, single family home development.

There was no site plan or layout available to Team members to allow the determination of the runoff change likely to occur from land use modification. Nevertheless, an estimate may be made of the runoff change likely to occur from the land use modification alone. Technical Release No. 55 of the Soil Conservation Service provides a technique which may be used in formulating the estimate. The method involves the determination of "runoff curve numbers", which relate amount of precipitation to amounts of runoff. Assuming that the corporate office was constructed on a typical acre of land, and covered with approximately 25% of impervious surfaces, it is estimated that development would increase the curve number on the parcel by 12 (from 50 to 62). On the other hand, if 68 percent of the one acre parcel was covered with impervious surfaces, it is estimated development would increase the curve number by 31 (from 50 to 81). Under these conditions, the runoff depth for a 25-year storm event would increase from 1.3 inches to 1.81 inches for the 25 percent coverage, and 1.3 inches to 3.5 inches for the 68 percent coverage; an increase of approximately 39% and 170%, respectively. These increases result mainly from covering highly permeable sand and gravel soils with impervious surfaces.

FIGURE 4
WATERSHED BOUNDARY MAP



N

SCALE

1" = 2000'

Watershed boundary for unnamed tributary of Neck River in northern portion of parcel

Portion of property draining to Neck River

Portion of property draining southward by intermittant channels ultimately into Long Island Sound

Approximate boundary line

Neck River

Design point

Watercourses showing direction of flow

Because these increases are significant, it is strongly recommended that a detailed engineering study of the pre- and post development runoff for the entire site, as well as a careful stormwater management plan, be prepared prior to any development.

If the parcel is developed as proposed, it might be useful to utilize existing ponds in the western parts of the parcel, as well as the wetland areas in the northern portion, for controlling post-development increases in runoff.

As mentioned earlier, approximately 50 percent of the subject parcel is occupied by regulated wetlands. Wetlands do serve many hydrological and ecological functions which include; (1) acting as a natural retention basin and thereby reducing downstream flood flows during periods of heavy precipitation, (2) trapping sediments from upstream areas, (3) changing water quality through biochemical processes which often result in cleaner water, and (4) providing habitat for many species of animals and plants. Because of these important functions, wetland disturbance via modification, filling, etc., should be avoided where possible.

A Flood Boundary and Floodway Map has been prepared for the Town of Madison. This map, which was prepared by the Federal Emergency Management Agency, delineates the boundaries for the 100 and 500 year flood. A "100 year flood" is a flood with a one percent chance of occurring in any given year while the "500 year flood" is a flood with one in 500 or .2% chance of occurring in any given year. As shown in Figure 5, which is a reproduction from the F.E.M.A. map, the areas subject to flooding during the 100 year storm appear to lie principally in wetland areas, along the Neck River, and other watercourses in the western parts of the subject parcel. The areas subject to flooding during the "500-year flood" occupy a thin band along the outer fringes of the "100-year flood" boundary.

It should be pointed out there may be other low-lying, swampy areas along streams and other wetland areas within the parcel which may be subject to flooding during the "100" or "500" year storms or during periods of heavy rainfall.

V. WATER SUPPLY

As noted earlier, it appears that if a corporate office park was developed on the parcel, a public water supply line would be extended to serve prospective users of the park. Nevertheless, if an individual on-site well or wells were desired to supplement the public water facilities, it is possible that outwash deposits (sand and gravel) in the eastern half of the site north of I-95 may have potential for a high yielding well or wells (Source: "Ground Water Availability Map for Connecticut" by Daniel Meade, 1978 and Connecticut Water Resource Bulletin No. 30). The potential of any particular location depends upon the texture and thickness of the deposits at the location, the proximity to streams and the size of those streams, and other factors. The saturated thickness of the deposits in the above mentioned area may be as much as 40 feet thick. Therefore, it may be worthwhile to drill an exploratory well or wells in this area to determine the aquifer potential of the outwash deposits.

FIGURE 5
FLOOD BOUNDARY MAP

LEGEND

- Study area boundary
- Floodway
- 100—year flood boundary
- 500—year flood boundary

N

SCALE

1" = 1000'

- adapted from map prepared by the Federal Emergency Management Agency
- boundaries are approximate

It is not known whether or not prospective users of the proposed corporate park would generate pollutants, (e.g., organic compounds, hydrocarbons such as gasoline and oil, other chemical substances) which could be a serious threat to water quality. If proper precautions and care in operations are not taken, certain types of substances such as those mentioned above may render water unusable for potable purposes. On the other hand, there may be types of industry which could locate here with no more impact on water resources than residential development at medium to low density. It should be noted that sand and gravel deposits, particularly coarse grained, have the ability to transmit groundwater rapidly and are more likely to allow pollutants to reach and degradate the quality of groundwater than other types of deposits.

A bedrock well is commonly capable of providing small but reliable yields of groundwater to individual wells. A survey of bedrock wells in the lower Connecticut River Basin (See Connecticut Water Resource Bulletin #31) indicates that more than 80 percent yielded 3 gallons per minute or more; 50 percent yielded about 7 gallon per minute or more and 10 percent yielded 18 gallons per minute or more. The Team's geohydrologist had the opportunity to review well completion reports for five wells drilled on the Grove School property. The yields of the wells, all of which tap the underlying bedrock, were 3 gallons per minute, 25 gallons per minute, two at 30 gallons per minute and one at 200 gallons per minute at depths of 600 feet, 200 feet, 250 feet, 295 feet and 375 feet, respectively.

If a well or wells are utilized on the site, they should be properly located. The well site should provide protection from possible sources of pollution by a combination of sufficient separating distances and a location which would be away from the normally expected flow of groundwater and contaminants introduced by subsurface sewage disposal systems, industrial wastes, etc.

The quality of groundwater at the property should be satisfactory. On file with the well completion reports for the Grove School were copies of water quality reports for the wells. They all reported satisfactory water quality from a physical, chemical and bacteriological standpoint.

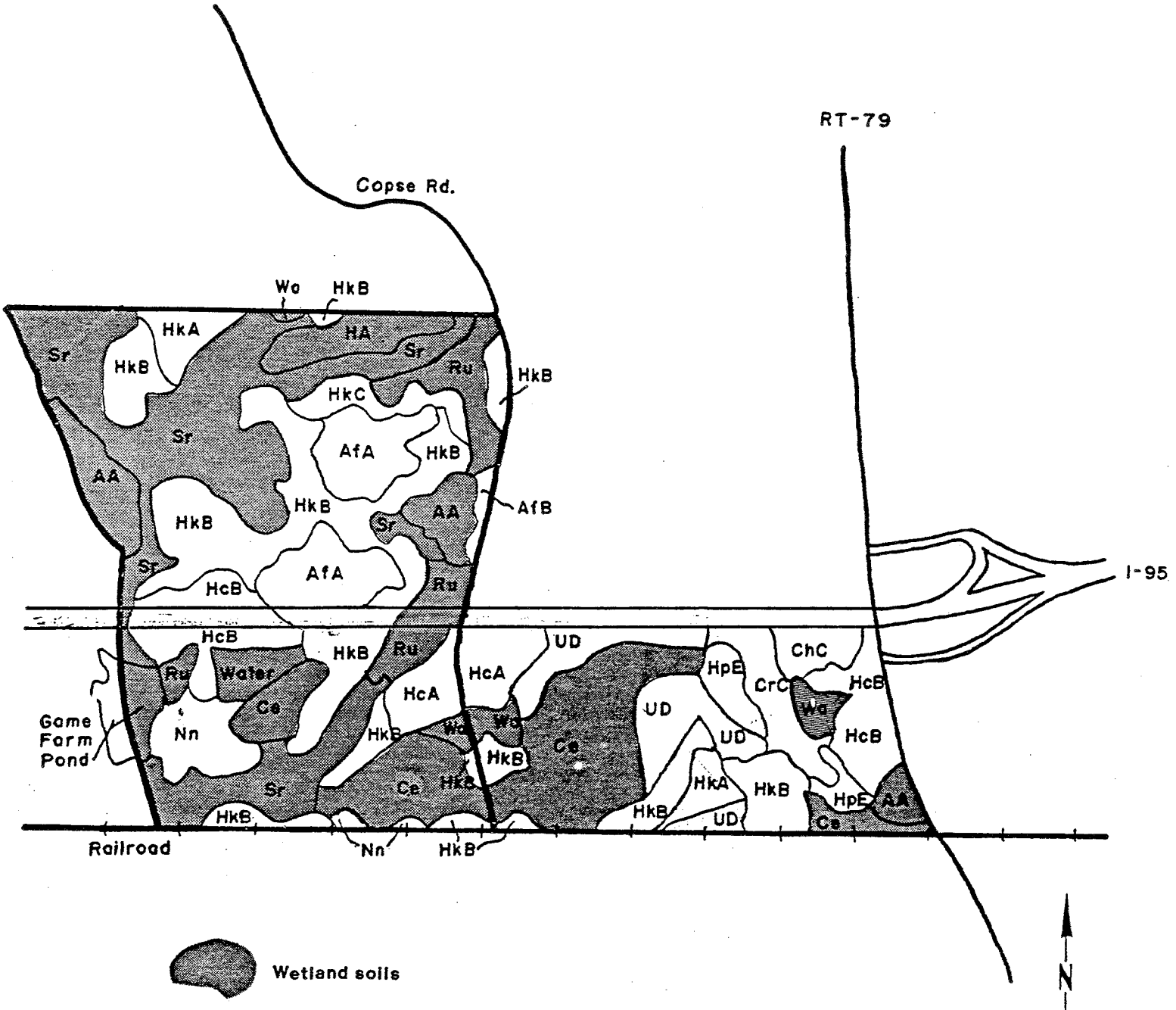
VI. SOILS

Figure 6 is an updated version of the data shown in the Soil Survey of New Haven County, Connecticut and is substantially correct. The symbols on the map identify map units. Areas labelled with the same symbol have the same composition of soils. The shaded areas on the map represent wetland soils.

Wetland Areas

Approximately half the study area is composed of wetlands All the wetlands are on nearly level surfaces (0 to 8% slopes). The wetlands provide natural flood protection to downstream areas. Floodwaters are detained within the wetlands and slowly metered out. Extensive filling of the wetlands will result in downstream flooding. Careful hydrologic analyses should be made of the area if extensive disturbance of the wetlands is anticipated.

FIGURE 6
SOILS MAP



Wetland soils

See text for soil descriptions

Map updated by Marc Beroz, USDA Soil Conservation Service from Soil Survey of New Haven County

SCALE

1" = 1000'

Map Units AA and Ce

The soils contained in the AA and Ce map units are deep, very poorly drained and contain layers of decomposing organic materials.

Map unit AA is dominated by Adrian and Palms soils These soils have organic materials only in their top layers. The organic material ranges from 16 to 50 inches thick and overlies sand or sandy loam mineral material to a depth of 60 inches or more.

Map unit Ce is dominantly Carlisle soils. These soils are composed of organic materials throughout their entire depth and range in thickness from 50 inches to 30 feet.

All these soils have water tables within one foot of the soil surface for most of the year. Water may pond on the soil surface for several weeks during the winter months or after heavy rains during the summer.

The soils in these map units are poorly suited for the proposed use. Their high water tables pose severe limitations for constructing septic systems, buildings and roads. The organic layers in the soils do not provide an adequate bearing surface on which to construct roads or buildings. If these areas are drained, the soils will subside. Flooding and frost heaving are also site limitations.

Map Unit Sr

Map unit Sr contains Scarboro soils which are deep and very poorly drained. These soils have an organic surface layer 2 to 6 inches thick which overlies sand to a depth of 60 inches or more. Depth to a seasonally high water table is less than 12 inches. Soils in this map unit have the same limitations as those listed above for map units AA and Ce except that the subsidence and bearing strength problems cited above will not occur here.

Map Unit Ru

Map unit Ru is dominantly Rumney soils which are deep and poorly drained. They are stratified and have textures of sand, fine sandy loam and silt loam to a depth of 60 inches or more. These soils have a high water table within 18 inches of the surface from November through May. Flooding may also occur during this same period.

The soils in this map unit are poorly suited for the proposed use. Soil wetness and flooding make this site poorly suited for septic systems. building foundations and road construction. Frost heaving would also be troublesome here.

Map Unit Wa

Map unit Wa is composed of Walpole soils which are deep and poorly drained. Typically the top 24 inches are sandy loam and overlie sand to a depth of 60 inches or more. These soils have a seasonally high water table within 12 inches of the surface.

The soils in this map unit are poorly suited for the proposed use due to their wetness. Even if these areas were drained, the highly permeable sand layers in these soils would still result in a severe limitation for septic systems. These sand layers may not adequately filter the septic effluent and this in turn may result in ground water contamination.

Non-Wetland Areas

Map Units AfA, HcA, HcB

The Agawam soils in AfA and Haven soils in HcA and HcB are nearly level to gently sloping (0-8% slopes), deep and well drained. The soils typically have silt loam or fine sandy loam surface layers 31 inches thick over sand and gravel to a depth of 60 inches or more. The silt loam textures are associated principally with the Haven soils in map units HcA and HcB.

These soils are poorly suited for septic tank absorption fields. The fast permeability of the sand and gravel layers in the lower part of these soils may not adequately filter the septic effluent. This could result in ground water contamination. These soils have slight limitations for building and road construction; however, there is a chance for some frost heaving on roads constructed on soils with silt loam surface textures (map units HcA, HcB). In addition, costs associated with building site development may significantly increase on slopes above 4% grade.

Map Units HkA and HkB

The Hinckley soils in these map units are nearly level to gently sloping (0-3% slopes) deep and excessively drained. The surface layers are typically gravelly sandy loam and loamy sand about 14 inches thick over stratified sand and gravel to a depth of 60 inches or more.

The soils in these map units are poorly suited for septic tank absorption fields. The fast permeability rates of the sand and gravel layers in the lower part of these soils may not adequately filter the septic effluent. This could result in ground water contamination. These soils have slight limitations for building and road construction. Costs associated with building site development may significantly increase on slopes above 4% grade.

Map Unit HkC

The HkC map unit contains Hinckley soils that are sloping (8-15% slopes), deep and excessively drained. These soils are the same as those described above in the HkA and HkB map units except for slope.

The soils in this map unit are poorly suited for septic tank absorption fields as described above for HkA and HkB. In addition, these soils have severe limitations for building site development due to slope.

Map Unit ChC

The ChC map unit is composed of Charlton soils that are sloping (8-15% slopes) deep and well drained. These soils typically have fine sandy loams and gravelly fine sandy loam textures to a depth of 60 inches or more.

Up to three percent of the soil surface is covered with stones and boulders.

The soils in this map unit have slight limitations for septic tank absorption fields. Some stones and boulders occasionally may be found below

the soil surface and this along with slope may increase septic system installation costs. These soils are poorly suited for building site development due to slope.

Map Unit CrC

This map unit is composed primarily of two very different kinds of soils that are so intermingled on the ground that they cannot be separated on the map. Both soils are gently sloping to sloping (8-15% slopes) and have 3 to 25 percent stones and boulders on the surface. One soil is named Charlton. The Charlton soils are 60 inches or more deep and are the same as those described above in map unit ChC. Charlton soils comprise about 45 percent of the CrC map unit.

The other major soil in this map unit is Hollis. Hollis soils are shallow and somewhat excessively drained. Typically they are fine sandy loam and are 10 to 20 inches deep over hard bedrock. The Hollis soils comprise about 30 percent of the map unit.

The difference in depth between the Hollis and Charlton soils result in quite different suitability ratings for each soil. The Charlton soils in this map unit have slight limitations for septic tank absorption fields. Some stones and boulders which occasionally may be found below the soil surface, and slope may increase septic system installation costs. These soils are poorly suited for building site development due to slope.

The Hollis soils in this map unit are poorly suited for septic tank absorption fields and building site development because of depth.

Site development within this map unit map unit must be carefully planned to take advantage of the deep soils. The Hollis soils do provide unique opportunities for landscaping.

Map Unit HpE

This map unit is composed primarily of two very different kinds of soils that are so intermingled on the ground that they cannot be separated on the map. Both soils are moderately steep and steep (15-35% slopes) and have 3 to 25 percent stones and boulders on their surface. One soil is named Hollis which is shallow and somewhat excessively drained. Typically they are fine sandy loam and 10 to 20 inches deep over hard bedrock. The Hollis soils comprise about 40 percent of the map unit.

The other major soil in this map unit is Charlton. These soils are deep and well drained. Typically they have fine sandy loam and gravelly fine sandy loam textures to a depth of 60 inches or more. Charlton soils comprise 35 percent of the map unit.

Both soils in this map unit are poorly suited for the proposed use due to steepness of slope. Additional problems are presented by the shallow depth to bedrock in the Hollis soils.

Map Unit Nn

The Ninigret soils in this map unit are nearly level, deep and moderately well drained. Typically these soils are fine sandy loam 25 inches thick over stratified sand and gravel to a depth of 60 inches or more. Depth to the seasonally high water table is 18 to 36 inches.

The soils in this map unit are poorly suited for the proposed use. The high water tables will interfere with septic system operation. Even if these soils were drained, they would have severe limitations for septic systems. The sand and gravel layers may not adequately filter the septic effluent and ground water contamination may occur. The relatively shallow depth to the water table will also impose moderate to severe limitations for building site development.

Map Unit UD

The soils in map unit UD have been drastically impacted by man. Soil material has been added or removed, and shaped. This map unit is identified in two locations along Woodland Road. Interpretations for these areas have not been made due to their unique nature. Any development within this map unit must be carefully planned.

Prime and Important Farmlands

Several of the map units within the study area qualify as Prime Farmland. Prime farmland is land that has the best combination of physical and chemical properties for producing food, feed, forage, fiber and oilseed crops, and is also available for these uses. The following map units qualify as Prime farmland: AfA, HcA, HcB and Nn.

Some map units qualify as Additional Farmlands of Statewide Importance. These farmlands, although not Prime, make a significant contribution to agriculture in Connecticut. These map units are; HkA, HkB, HkC and Ru.

Portions of this site are presently being farmed. In addition, there is a vegetable truck farm in operation along Copse Road. With the closeness it has to a large population-market area, its preservation should be considered. Unlike dairy farms, vegetable farms can successfully exist and survive in areas isolated from other farming enterprises.

Erosion and Sediment Control

The non-wetland soils mapped on this site vary from sandy to fine sandy loams. This type of soil has very little cohesiveness and hence is very susceptible to soil erosion and sedimentation.

With the complex pattern of wetland and non-wetland areas on this site, adequate erosion and sediment control planning and implementation is vital if the wetlands are to be protected. Some erosion and sediment control practices that can be utilized for this development include:

1. Temporary seeding of all disturbed areas that are to remain so for longer than 30 days.

2. Permanent seeding of all bare areas immediately following final grading.

3. The use of sediment filter fence as a last line of protection to prevent sediment from damaging wetland areas.

These practices and more can be found in the Erosion and Sediment Control Handbook for Connecticut which is available at the New Haven Conservation District (269-7509).

VII. SEWAGE DISPOSAL

Since there is no public sewage system in the Town of Madison, potential users of the proposed corporate office park would require individual on-site sewage disposal facilities.

At the time of the ERT's field review, there was no detailed soils information (i.e., deep test holes, percolation tests) available to Team members in regard to the subject parcel. However, based on mapped information (i.e., soil map prepared by the soil scientist, surficial geologic map, topographic map, etc.), and visual inspection of the property as well as other published information, it appears the non-wetland soils north of I-95 and west of the Grove School have some potential for on-site sewage disposal systems. As pointed out in the preceeding section of this report, however, the sandy and gravelly well drained soils which occupy these areas are known to have rapid seepage rates and as a result may not have the ability to provide good filtration and renovation of septic tank effluent or other types of pollutants. Careful planning will, therefore, be essential if this area is developed to ensure that groundwater pollution does not occur. Also, as mentioned in the Water Supply Section of the report, under certain hydrogeologic conditions, sand and gravel deposits lend themselves to larger than average yields of water than the underlying bedrock aquifer and therefore may constitute a major source of water supply. Protection of this resource should also be considered if the area is developed.

If this tract of land is developed as a corporate office park, it will be necessary to conduct detailed on-site testing in order to determine groundwater levels and whether there is any shallow underlying bedrock. If the parcel is developed, engineered design plans for septic systems should be prepared and submitted to the proper state and local health departments for review.

It should be pointed out that when the minimum soil percolation rate is faster than one inch per minute, the State Public Health Code deems it an "area of special concern". As a result, sewage disposal systems proposed in these areas require a particular investigation and special design which must comply with all applicable sections of the Code. Some safeguards that may be taken in an area where soils are highly permeable include (1) increasing the minimum separating distance required above the maximum groundwater table or underlying bedrock, (2) limiting the density of development according to the capacity of the soil, (3) avoiding the overloading of the potential sand and gravel aquifer area(s) with too great a volume of sewage waste water, and

(4) increasing the separating distances from any potential wells, which, depending on a potential park user, may be required to supplement the public water supply.

The Town should carefully evaluate any potential users of the proposed corporate park as to the type of possible wastes they may generate and the methods for handling and disposing of such wastes. By doing so, the Town can help ensure that development of the area does not exceed the carrying capacity of the land.

VIII. VEGETATION AND WILDLIFE

For the sake of discussion, the ERT's Biologist considered the site of the proposed zoning change as four different areas. Area I is bounded on the east by Copse Road, on the south by Interstate 95, and on the west by the Neck River. Appendix A presents a vegetation map and inventory for Area I. Area II is the area around Grove School, and Area III includes Game Farm Pond. The vegetation of these two areas is mapped and identified in Appendix B. Appendix C is the vegetation map and inventory for Area IV, which is bounded on the east by Route 79, on the south by the Penn Central Railroad, on the west by Copse Road, and on the north by I-95. Appendix D lists the birds and other observed wildlife. Appendix E identifies the literature cited in this portion of the report.

Weeds in Winter by Lauren Brown, Newcomb's Wildflower Guide by Lawrence Newcomb, and Inland Wetland Plants of Connecticut were used in identifying plant species. Bird species were identified with the aid of Field Guide to the Birds of North America, a publication of the National Geographic Society.

A. Description of Major Ecosystems

The area of the proposed zone change includes several areas that are significant in terms of wetland resources, vegetation associations, and wildlife value. Game Farm Pond, the man-made pond near Grove School, the duck pond on the south side of Woodland Road, and the shrub wetland located to the west of Concord Meadows Condominiums are particularly noteworthy.

Game Farm Pond used to be a state-maintained trout farm and still supports a substantial fish population. The pond was created by damming the Neck River. It supports some emergent vegetation, such as common arrowhead, pickerelweed, and waterlilies. A vigorous cattail marsh is located at the northern end of the pond. Along with the cattails, the marsh supports tussock sedge, alders, and highbush blueberry.

Below the dam, the banks of the Neck River are vegetated with weeping willows, sassafras, and silky dogwood. Numerous songbirds were heard in the trees, including Black-capped Chickadees and American Crows. Mute Swans and Mallards were observed on the pond. During the summer months, it would not be surprising to find Green Herons, Spotted Sandpipers, American Robins, warblers, and flycatchers using this habitat. Belted Kingfishers would be able to find food in the pond. It would not be surprising to observe skunks, raccoons, muskrat and osprey around Game Farm Pond. Appendix B shows the vegetation map for this area.

Directly to the east of Game Farm Pond is a spring-fed, man-made pond, which was reportedly dredged to a depth of 30 feet. Due to its depth, the pond does not support extensive emergent vegetation, although a fringe of marsh vegetation has begun to develop along the southern and eastern margins of the pond. An assortment of sedges, asters, cattails, milkweed, and pondweed was observed in this fringe. During the April 4 inspection, a Great Blue Heron flew out of a hiding place in the fringe marsh. Rare and Endangered Species of Connecticut and Their Habitats, a publication of the DEP's Natural Resources Center, lists the Great Blue Heron as a "rare" species in this state. Sensitive to human disturbance, this heron has few breeding sites in Connecticut. The vegetation for the man-made pond is also shown in Appendix B.

During the field inspections, people were observed horseback riding on the paths around the ponds. The ponds are also used for boating, fishing and swimming. Their habitat and wildlife diversity and proximity to public and private schools give the ponds high potential educational value.

A combination of shallow and deep water in both ponds make them valuable for both cold- and warm-water fish species. The emergent and marsh vegetation in Game Farm Pond provides fish with refuge and forage areas. Birdlife benefits from the presence of berry-producing shrubs near the ponds, including common blackberry, highbush blueberry and silky dogwood, and from the numerous insects. The cattails are important in providing birds with nesting sites and material. The proximity of tree stands to the ponds is also important to birdlife in providing nesting and refuge areas.

Between Woodland Road and the Penn Central Railroad tracks is a small duck pond (see Appendix C). The pond offers a textbook illustration of zonation patterns that are typically found in ponds. In the center of the pond is open water. Moving toward shore is a band of emergent vegetation. Closer to the shore is a band of shrubs and, finally, a band of trees. The significance of this typical zonation pattern is that it results in a high level of interspersion, or habitat diversity. Habitat diversity, in turn, permits a diversity of wildlife to use a site. The pond provides wildlife with water to drink and fish, insects, invertebrates, and algae to eat. The emergent vegetation is a source of food and nesting materials. Shrubs and trees provide berries and nuts, as well as nesting and refuge sites.

Along the margins of the duck pond, water willow forms the emergent vegetation zone. Immediately landward of the water willows are the shrubs, which include leatherleaf, viburnums, sweet pepperbush, silky dogwood, and highbush blueberry. Tulip trees, red maple, black birch, red oak and white oak make up the tree zone. Numerous songbirds were observed, along with Mallards. Wood Duck boxes have been placed along the pond borders. Also observed near the pond were deer droppings. Although deer use wetlands during each season, they probably make the most use of the pond area during the winter. When upland areas are frozen and food is difficult to find, deer browse in wetlands where shrubs and young saplings are still accessible. The pond area is also likely to support turtles, frogs, snakes, skunks, raccoons, and warblers. Rufous-sided Towhees are other likely summer residents. The vegetation around the duck pond is mapped in Appendix C.

Almost twenty acres in extent, an alder swamp is found to the west of Concord Meadow Condominiums and lies on both the north and south sides of Copse Road. The swamp's vegetation is shown in Appendix C and includes speckled

alder, sphagnum moss, sweet pepperbush, clammy azalea, false hellebore, skunk cabbage, cinnamon fern, sensitive fern, tussock sedge, pussy willows, shadbush, cattails and red maples. Red cedars occur intermittently on hummocks which are slightly elevated and better-drained than the surrounding swamp. Numerous Red-winged Blackbirds were observed in the trees. The swamp is a likely habitat for warblers, flycatchers, mice, raccoons, muskrat, and hawks.

The alder swamp is significant because of its extent. It is unusual to find an alder swamp in Connecticut covering so much acreage. The capacity of alders to fix atmospheric nitrogen and turn it into a nutrient form that wildlife can use also contributes to the significance of this swamp. It undoubtedly is a nutrient-rich, productive area.

Another significant area is the corn field and other agricultural fields which are mapped in Appendix A. Since so much of Connecticut's agricultural land has been developed or allowed to revert to forest land, species which are dependent upon open fields and forest "edge" habitats are declining in number. The Eastern Meadowlark, Eastern Bluebird and Bobolink are among the affected species.

A significant find was the observation of an American holly in one of the wetlands off Copse Road. Familiar to many as the red-berried ornament used in Christmas wreaths, the American holly is a victim of its own beauty. It has undergone so much cutting for use in holiday decorations that it is listed as a declining specie in Rare and Endangered Species of Connecticut and Their Habitats.

Much of the woodland in the area of the proposed zone change is dominated by red maple, a specie with low timber value. Oaks, species with particularly high timber value, occur in stands near Game Farm Pond and the man-made pond. These stands have high recreational and wildlife value because of their proximity to the ponds. Woodlot management to encourage oak development might prove profitable in the area mapped as "Maturing Hardwoods" in Appendix C.

B. Adverse Impacts

Construction of corporate offices, research laboratories and accessory facilities could have an adverse impact on wetland habitats if construction and siting are not carefully and thoughtfully controlled. If offices and parking areas are allowed to be constructed in areas bordering on ponds, wildlife could lose valuable buffer areas. Wildlife populations which would be most likely to suffer from the loss of buffer areas are those which are sensitive to human interference. The rare Great Blue Heron in particular is a specie not likely to return to the site if buffer areas are not provided. Filling wetlands would result in habitat loss and a subsequent decline in population of songbirds, amphibians, mammals, and deer. Birds of prey may also be affected.

Filling wetlands can also result in the siltation of ground and surface waters. Measures should be taken to minimize and mitigate this impact in instances where filling is permitted in or adjacent to wetlands or watercourses.

Areas which are not suited to construction activities and which require buffer strips are Game Farm Pond, the man-made pond, the alder wetland to the west of Concord Meadow Condominiums, and the duck pond. Consideration might also be given to preserving and managing one of the fields in Area I to encourage wildlife that depend on field and forest edge habitats.

C. Mitigating Measures

The Planning and Zoning Commission has proposed several measures which will have the effect of minimizing intrusion into wetland areas. Proposed Regulation 4.1.13.2.1.f., for example, restricts building coverage to twelve percent (12%) of the building lot. Proposed Regulation 4.1.13.2.3 further requires that parking and loading space not cover more than 25 percent of the lot. These proposed rule changes may help preserve sensitive wetland and wildlife areas if development is confined to upland portions of building lots.

The Planning and Zoning Commission has also proposed to provide for buffer zones under Section 4.1.13.2.2. Vegetated, or at least neatly landscaped, buffers would be required "...in all side yards and rear yards, and for a distance of 150 feet in depth contiguous to Copse Road north of the Connecticut Turnpike." Buffers with carefully planned shrub and tree plantings in side and rear yards could help mitigate wildlife losses by providing nesting sites, refuge areas, and food sources for songbirds and small mammals. The proposed 150-foot buffer strip along Copse Road north of I-95 would be particularly valuable in protecting wetland resources and protecting the American holly. If one of the agricultural fields in this area can be maintained as an open field, the buffer strip could provide a significant barrier between the field and Copse Road, a point which would be particularly beneficial to human-intolerant species.

Another zoning scheme that could protect wildlife areas is "cluster" zoning. The Commission should consider regulations which would encourage concentrated development in upland areas while leaving wetland and surrounding buffer areas intact.

A measure to be considered in the issuance of inland wetland permits would be the requirement of deeded conservation easements. If a builder requested a permit to fill in a portion of a wetland, or to use a wetland as a detention basin, for example, the Inland Wetland Commission might decide to require future protection of the remainder of the wetlands on the builder's property by requiring an easement. The easement would be granted to a third party, such as a local land trust, and would be recorded on the land records. The easement's effect would be the permanent protection of the area of land specified.

Conservation easements should be applied judiciously, however. It would not benefit the Town of Madison if a builder would fill and destroy a high-quality wetland while preserving a low-quality, disturbed one. Before deciding to require a conservation easement, the Inland Wetland Commission should explore every avenue with the builder to ensure that intrusion into wetlands is minimized, that adverse environmental impacts are mitigated, and that there are no other feasible alternatives that would minimize wetland encroachment.

Conditions may be incorporated into inland wetland permits to control sedimentation and erosion. Where fill encroaches into or abuts wetlands, slopes should be stabilized at 2:1, and should be seeded and mulched. Staked haybales or silt fencing should be placed at the proposed toe of slope prior to fill placement and maintained until the grass plantings begin to stabilize slopes.

To minimize wildlife impacts, foundation and buffer plantings should employ shrubs and trees with high wildlife value. A combination of deciduous and evergreen varieties should be employed. Deciduous shrubs and trees provide nesting materials and food, while evergreens provide cover during winter months. Plantings might include Japanese yew, Chinese juniper, and red cedar. Berry-producing species are essential and might include hawthorns, dogwood, cherry, highbush blueberry, bayberry, and viburnums.

Another means of protecting wildlife is incorporating wildlife habitat characteristics into detention basins. Although it is not feasible in all cases, it is sometimes possible to excavate basins to a depth sufficient to support fishlife (from four to eight feet). About a third of the basin could be maintained at a depth shallow enough to support marsh grasses. Cattails should be planted in the shallows and along the edge of the basin. An appropriate planting of berry-producing wetland shrubs could be established landward of the cattails and marsh grasses. Excavation activities to create wildlife amenities, however, should not be encouraged in areas that already support high-quality wetlands. If a minimum area of one-quarter acre is not available for pond creation, it will not be feasible to plan for a fish pond. Even in smaller basins, however, it would be possible to plant cattail rhizomes in the basin perimeter and to incorporate shrubs into the planting scheme.

To maintain the recreational and wildlife value of Game Farm Pond and the man-made pond, their owner might consider developing a long-term management plan. Maintenance of pedestrian paths, docks and swimming floats and periodic maintenance dredging could be addressed in such a plan. The plan could also outline additional planting plans and a management program for the wooded buffer areas. Provision of wood duck boxes or osprey stands is another wildlife amenity that could be considered in the plan.

The present state of Game Farm Pond and the man-made pond does not indicate a need for re-dredging in the immediate future, or in the next several years, for that matter. The man-made pond is more than adequately deep for use as a swimming pond and is certainly deep enough to support cold water fish. Portions of Game Farm Pond appear to be quite deep and are at least adequate to support warm water fish. Emergent vegetation is sufficient to make Game Farm Pond valuable for wading birds and dabbling ducks, but the pond is not choked with weedy growth and did not appear stagnant during inspections. The following are guidelines for determining the need, appropriateness and extent of maintenance dredging:

1. The swimming pond should be at least six to eight feet deep in the center;

2. For a warm water fish pond, a minimum depth of eight feet is required over at least one-third of the pond area;

3. It is recommended that Game Farm Pond be maintained as a wildlife pond. The marsh at the northern end of the pond should be maintained at one-third of the total pond/marsh area. The depth in the center of the pond should be at least three to five feet;

4. For a wildlife pond, 4:1 or 5:1 side slopes should be maintained to permit the growth of emergent vegetation; and

5. For fishing or swimming ponds, side slopes no steeper than 3:1 are recommended to minimize erosion problems.

D. Summary and Recommendations

The area which would be subject to Madison's proposed zoning changes includes several sites of regional significance. Special measures should be implemented to preserve and enhance the following areas in the face of anticipated development:

1. Game Farm Pond and the Man-made Pond. The ponds are regionally significant in that they provide a habitat and feeding ground for the declining Great Blue Heron. Recreational, educational, aesthetic and wildlife values lend to the ponds' local significance.

2. The Alder Wetland. The shrub wetland located immediately to the west of Concord Meadow Condominiums is regionally significant because of its extent and because of the density of nitrogen-fixing alders.

3. The Area to the North of I-95 and to the West of Copse Road. This area is regionally significant because it is home to the rare American holly. Owing to the decline in prime agricultural land in Connecticut, this area is also significant because of its open, undeveloped farmland.

4. The Duck Pond. The duck pond is significant, not only for providing habitat for dabbling ducks and songbirds, but also because it apparently acts as a winter feeding ground for deer.

Recommendations

The following are offered for the consideration of the Madison Planning and Zoning and Inland Wetlands Commissions and for the owners of the ponds:

1. Development should be avoided around Game Farm Pond, the swimming pond, the alder swamp, and the duck pond;

2. One of the fields off Copse Road should be considered for preserving as a managed open area;

3. Buffer strips should be provided around pond and wetland areas to protect human-intolerant species and to preserve an adequate level of interspersion;

4. The oak stands near Game Farm Pond and the swimming pond should be preserved in their natural condition because of their high recreational and wildlife value;

5. A cluster zoning scheme could be considered to concentrate development in upland areas while avoiding wetlands;

6. Deeded conservation easements might be required of builders, as appropriate;

7. Fill in wetlands should be stabilized with 2:1 side slopes, which should be seeded and mulched;

8. Staked haybales or silt fencing should be placed at proposed toes of slope and should not be removed until slopes are stabilized by vegetation growth;

9. Foundation and buffer plantings should include a combination of deciduous and evergreen species with high wildlife value. Plantings might include Japanese yew, Chinese juniper, red cedar, hawthorns, dogwoods, cherry, highbush blueberry, bayberry, and viburnums;

10. Wildlife amenities should be incorporated into detention basins, as appropriate. At a minimum, cattail rhizomes and shrubs should be planted around the basin perimeters; and

11. A long-term management plan could be developed for Game Farm Pond and the swimming ponds.

IX. PLANNING CONSIDERATIONS

State and Regional Plans of Development (to the year 2000) advocate commercial and industrial development near areas of concentrated population density. All principal goals of the Regional Plan foster orderly growth encompassing a variety of land uses within each municipality leading to continuous growth and stability of the tax base and less dependancy upon the residential component of the Grand List for municipal services.

The Town of Madison lacks a town plan for orderly growth. From 1970 to 1980 the Town experienced a 44 percent increase in population and a 49 percent increase in housing units. Projections indicate a population growth of 3000 (21 percent) and an increase of 913 housing units (17 percent) between 1980 and 2000. The State of Connecticut employment projections (by Town of Employment) indicate that from 1980 to 2000 manufacturing employment will increase from 50 to 58, trade employment from 911 to 1051, and "other" from 2150 to 2686. Total employment will increase from 3111 to 3998.

Zoning for Corporate Office Park use is compatible with the demographic characteristics of the Town of Madison. However, suitable areas for development near the Town Center are few, and some sites previously zoned for non-residential use have ultimately been developed for residential use. Land to be zoned for non-residential use should be carefully selected and the Town should undertake a commitment to this use. Such commitment should be in the form of support for non-residential use development only, and should be implemented through appropriate zoning and performance standards, adequate local street and highway access systems and community service support facilities.

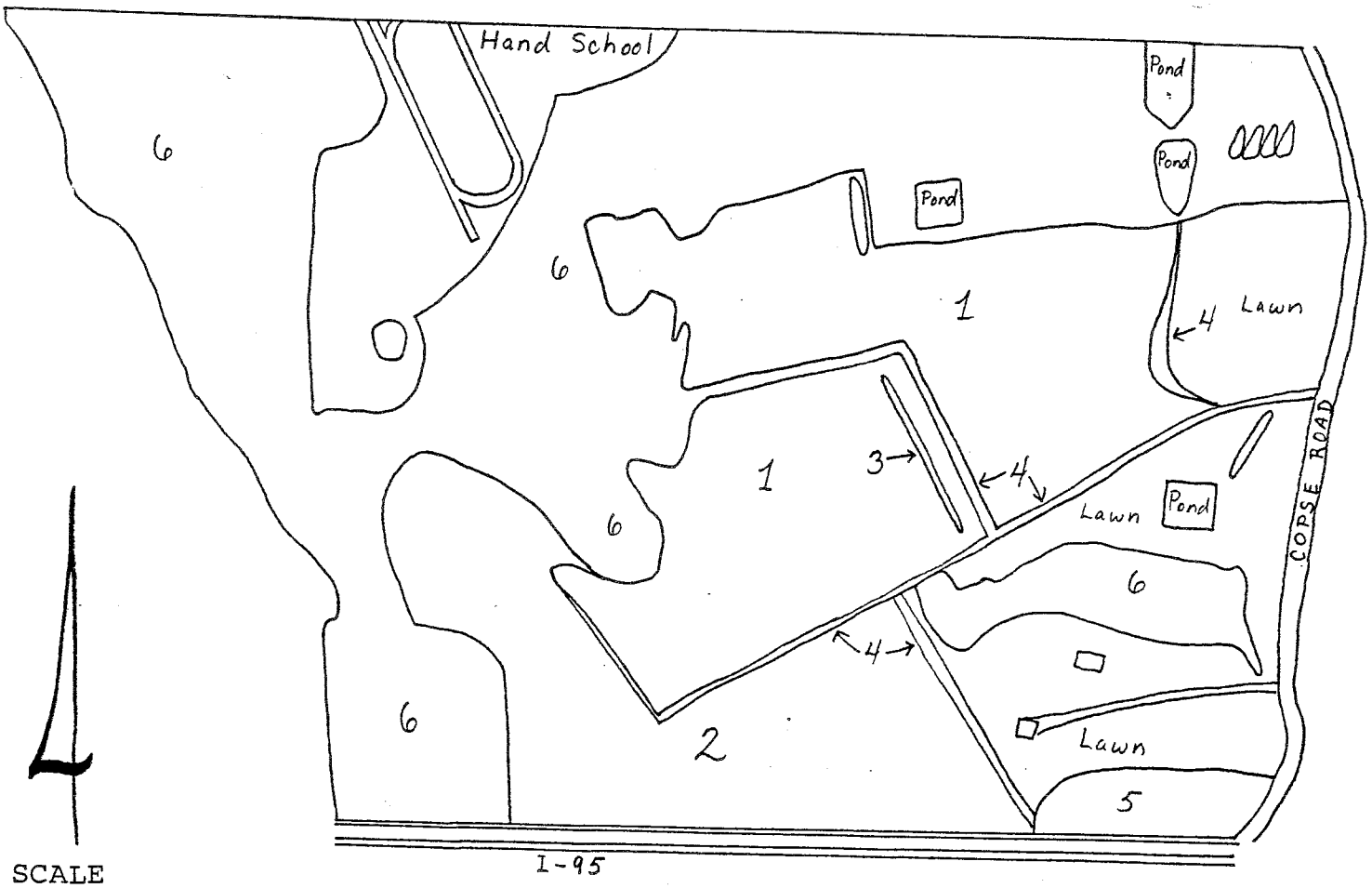
The proposed zone in the application is for Office Park Use, a use which requires not only a moderate to large amount of buildable acreage, but compatibility with adjacent land uses and access roads with carrying capacities capable of assimilating peakhour traffic demands and with nearby linkages to state and federal highways. Existing development within the site boundaries, approved residential development plans, construction limitations due to soil and drainage conditions and lack of readily available access to buildable acreage severely limits the development potential of the land south of I-95 in the opinion of the Team's Planner. Of the remaining acreage, that north of I-95, much is in wetlands, leaving about 40 + acres for non-residential development. While there should be no conflict of use with the High School to the north, other adjacent land use development and winding local roads are decidedly low density in nature. If this site is to be rezoned for non-residential use, the Town should seriously consider undertaking measures to insure that: 1) any development will be compatible with the neighborhood, 2) access to and from the site is satisfactory, and 3) traffic generated will not exceed the carrying capacity of the access road.

X. APPENDIX

* * * * * *

APPENDIX

A. VEGETATION MAP AND INVENTORY FOR AREA I



SCALE
1" = 420'

LEGEND

1 = Cornfield
2 = Abandoned Field
3 = Spruce Hedgerow
4 = Deciduous Hedgerow
5 = Shrub Wetland
6 = Red Maple Swamp

NOTE: See next page for vegetation inventory.

Vegetation Inventory

Area I

1. CORNFIELD

   Corn
   Foxtail grass (Setaria sp.)
   Quack grass (Agropyron repens)
   Evening primrose (Oenothera biennis)
   Ragweed (Ambrosia artemisiifolia)
   Queen Ann's lace (Daucas carota)
   Oriental bittersweet (Celastrus orbiculatus)
   Common blackberry (Rubus allegheniensis)
   Black-eyed Susan (Rudbeckia serotina)

2. ABANDONED FIELD

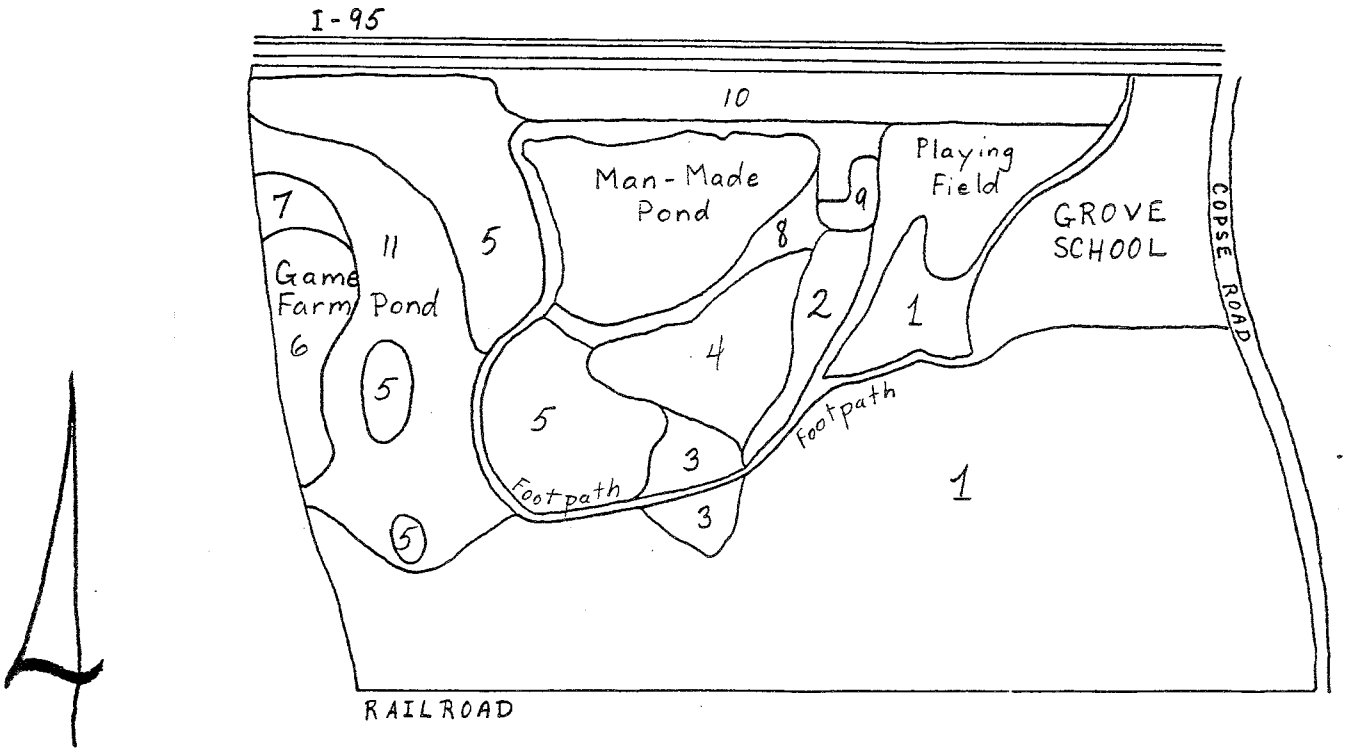
   Little bluestem (Andropogon scoparius)
   Orchard grass (Dactylis glomerata)
   Asters (Aster spp.)
   Goldenrod (Solidago spp.)
   Steeplebush (Spiraea tomentosa)
   Round-headed bush clover (Lespedeza capitata)
   Highbush blueberry (Vaccinium corymbosum)
   Sumac (Rhus sp.)
   Poison ivy (R. radicans)
   Japanese honeysuckle (Lonicera japonica)
   Red cedar (Juniperus virginiana)
   Flowering dogwood (Cornus florida)
   Wild black cherry (Prunus serotina)
   Red maple (Acer rubrum)
   Red oak (Quercus rubra)
   Pin oak (Q. palustris)
   White oak (Q. alba)
   White pine (Pinus strobus)
   Eastern white cedar (Thuja occidentalis)

3. SPRUCE HEDGEROW: Picea sp.

4. DECIDUOUS HEDGEROW

   Japanese honeysuckle
   Oriental bittersweet
   American grape (Vitis americana)
   Poison ivy
   Common greenbrier (Smilax rotundifolia)
   Red maple
   White oak
   Red cedar
   Wild black cherry
   Grey birch (Betula populifolia)

B. VEGETATION MAP AND INVENTORY FOR AREAS II and III



SCALE
1" = 420'

LEGEND

1 = Swamp Forest
2 = Topsoil Excavation Site
3 = Clearing
4 = Red Maple/Shrub Swamp
5 = Woodlot
6 = Game Farm Pond
7 = Pond-side Marsh
8 = Pond Margin
9 = Pocket Wetland
10 = Roadside Vegetation
11 = Open Field

NOTE: See next page for vegetation inventory.

Vegetation Inventory

Areas II & III

1. SWAMP FOREST

Ground cedar (Lycopodium complanatum)
Cinnamon fern
Sensitive fern
Tussock sedge (Carex stricta)
Skunk cabbage
Cinquefoil
False hellebore
Evening primrose
Goldenrod
Meadowsweet (Spiraea latifolia)
Silky dogwood
Sweet pepperbush
Shadbush
Witch hazel (Hamamelis virginiana)
Common greenbrier
Catbrier (Smilax glauca)
Trailing honeysuckle (Lonicera tartarica)
Bayberry
Poison ivy
Sumac
Speckled alder (Alnus rugosa)
Pussy willow (Salix discolor)
Mountain laurel (Kalmia latifolia)
Red maple
American beech (Fagus grandifolia)
Sassafras (Sassafras albidum)
Black birch (Betula lenta)
Grey birch
Red oak
White oak
White ash (Fraxinus americana)
American elm (Ulmus americana)
Weeping willow (Salix sp.)
Wild black cherry

2. TOPSOIL EXCAVATION SITE (HINCKLEY SOILS)

Starcap moss
Little bluestem
Goldenrods
Meadowsweet
Pinweed (Lechea sp.)
Pearly everlasting (Anaphalis margaritacea)
Sweet everlasting (Gnaphalium obtusifolium)
Dewberry (Rubus flagellaris)
Common blackberry

Sweetfern (Myrica asplenifolia)
Highbush blueberry
Silky dogwood
Red cedar
Red maple seedlings

3. CLEARING

Starcap moss
Little bluestem
Toad rush (Juncus bufonius)
Bergamot (Monarda sp.)
Dewberry
Common blackberry
Sweetfern
Bayberry
Pussy willow
White pine

4. RED MAPLE/SHRUB SWAMP

Tussock sedge
Common cattail (Typha latifolia)
Highbush blueberry
Clammy azalea (Rhododendron viscosum)
Sweet pepperbush
Bayberry

5. WOODLOT

Ground cedar
Red cedar
Red oak
White oak
Red maple
Sassafras
Grey birch

6. GAME FARM POND

Algae
Water lilies (Nymphaea spp.)
Pickerelweed (Pontederia cordata)
Common arrowhead (Sagittaria latifolia)

7. POND-SIDE MARSH

Common reed (Phragmites australis)
Common cattails
Tussock sedge
Alders
Highbush blueberry

8. POND MARGIN

Sedges
Rushes
Common cattail
St. John's-wort (Hypericum perforatum)
Asters
Pondweed
Water horehound (Lycopus americanus)
Milkweed

9. POCKET WETLAND

Starcap moss
Wooly grass (Scirpus cyperinus)
Water willow (Decodon verticillatus)
Little bluestem
Sweet pepperbush
Highbush blueberry
Bayberry
Red cedar
Red maple

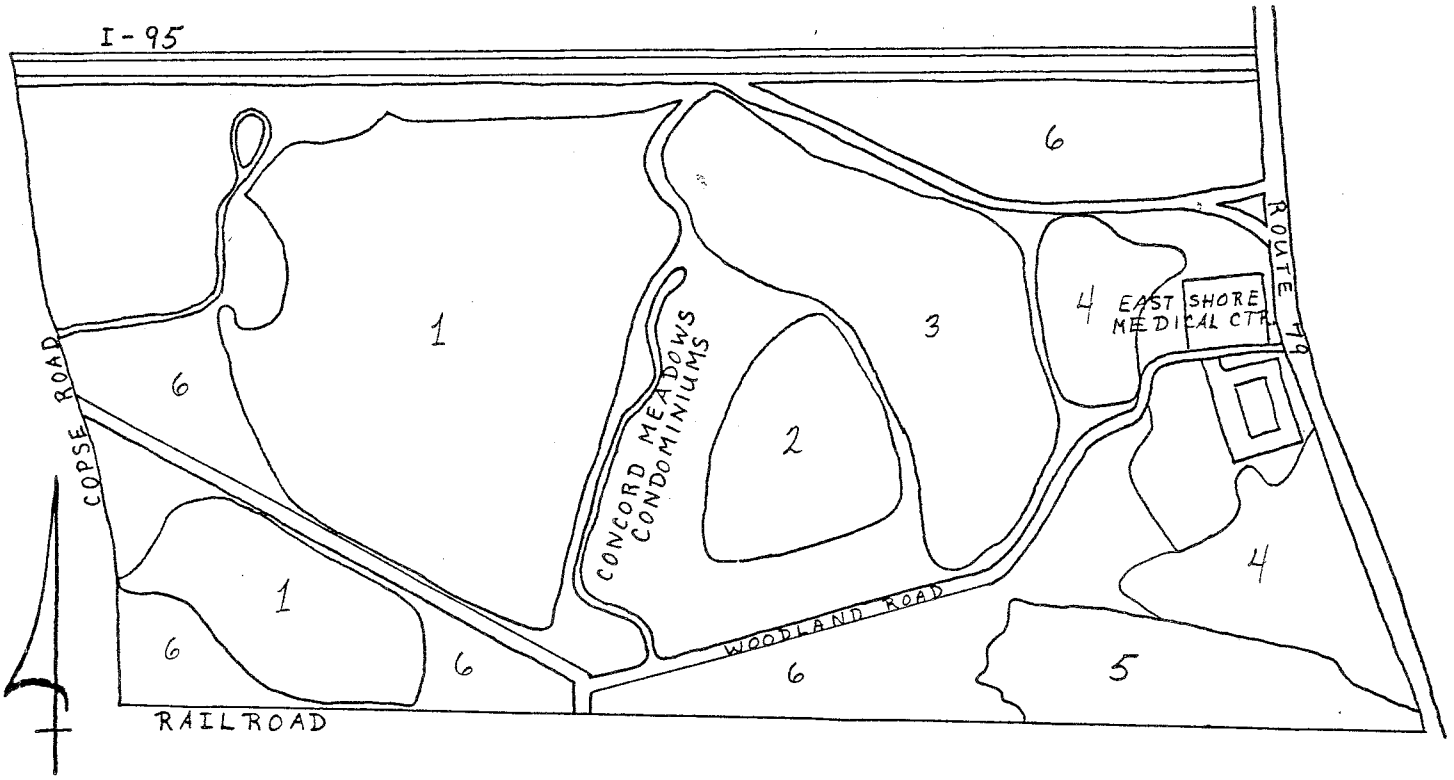
10. ROADSIDE VEGETATION

Field grasses
Little bluestem
Red cedar

11. OPEN FIELD

Field grasses
False indigo (Amorpha fruticosa)
Goldenrod
Aster
Common blackberry

C. VEGETATION MAP AND INVENTORY FOR AREA IV



SCALE
1" = 420'

LEGEND

1 = Shrub Wetland
2 = Abandoned Field
3 = Maturing Hardwoods
4 = Red Maple Swamp
5 = Duck Pond
6 = Second-growth, Disturbed Roadside Areas

NOTE: See following pages for vegetation inventory.

Vegetation Inventory

Area IV

1. SHRUB WETLAND

Tussock sedge
Common reedgrass
Common cattail
Narrow-leaved cattail (Typha angustifolia)
Sphagnum moss
Cinnamon fern
Sensitive fern
False hellebore
Skunk cabbage
Clammy azalea
Sweet pepperbush
Sweetfern
Common blackberry
Rose
Shadbush
Speckled alder
Pussy willows
Highbush blueberry
Red maple
Black birch
Grey birch x White birch

2. ABANDONED FIELD

Little bluestem
Foxtail grass
Kentucky bluegrass
Sedges
Switchgrass (Panicum virgatum)
Queen Ann's lace
Evening primrose
Aster
St. John's-wort
Yarrow (Achillea millefolium)
Field dock (Rumex crispus)
Peppergrass (Lepidium campestre)
Chicory (Cichorium intybus)
Carpetweed (Mollugo verticillata)
Goldenrod
Round-headed bush clover
Milkweed
Common plantain (Plantago major)
Pearly everlasting
Blue curls (Trichostema dichotomum)
Selfheal

Japanese honeysuckle
Rose
Dewberry
Meadowsweet
Bayberry
Sweetfern
Japanese knotweed (Polygonum cuspidatum)
Forsythia (Forsythia suspensum)
Common greenbrier
Sumac
Highbush blueberry
Mullberry (Morus alba)
Wild black cherry
Red cedar
Grey birch
Red maple
Quaking aspen
White oak
Flowering dogwood
Crabapple (Pyrus sp.)

3. MATURING HARDWOODS

Ground cedar
Little bluestem
Sedges
Goldenrod
Common blackberry
Highbush blueberry
Red oak
White oak
Black birch

4. RED MAPLE SWAMP

Tussock sedge
Sensitive fern
Cinnamon fern
Skunk cabbage
Goldenrod
Asters
Seedbox (Ludwigia alternifolia)
St. John's-wort
Viburnums
Highbush blueberry
Silky dogwood
Sweet pepperbush
Poison ivy
American pokeweed (Phytolacca americana)
Tulip tree (Liriodendron tulipifera)
Red maple
Grey x White birch
Black birch
Red oak
White oak

5. DUCK POND AND POND MARGINS

Tussock sedge
Water willow
Arrowwood
Sweet pepperbush
Highbush blueberry
Silky dogwood
Leatherleaf (Chamaedaphne calyculata)
Tulip tree
Red maple
Black birch

6. SECOND GROWTH, DISTURBED ROADSIDE AREAS

Field grasses
Goldenrods
White oak
Red oak
Red cedar
Red maple
Black birch
Grey birch

D. BIRDS AND OTHER WILDLIFE OBSERVED

American Robin (Turdus migratorius)
Red-winged Blackbird (Agelaius phoenicus)
Chipping Sparrow (Spizella passerina)
Tufted Titmouse (Parus bicolor)
Black-capped Chickadee (P. atricapillus)
American Crow (Corvus brachyrhynchos)
Mallards (Anas platyrhynchos)
Blue Jay (Cyanocitta cristata)
Herring Gull (Larus argentatus)
Northern Oriole (Icterus galbula)
Mourning Dove (Zenaida macroura)
Northern Mockingbird (Mimus polyglottos)
Great Blue Heron (Ardea herodias)
Mute Swan (Cygnus olor)

Other Wildlife Observed

Pickerel
Deer (droppings observed)
Rabbits (browse and ground nests observed)
Spring peepers
Mosquitoes
Wasp nest

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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.