

ROUTE 55 FREEWAY EXTENSION FEASIBILITY STUDY

Atlantic County, Cape May County and Cumberland County

prepared by:



State of New Jersey
Department of Transportation
Bureau of Preliminary Engineering

**Technical
Memorandum #3**

**Environmental
Constraints**



in association with

Gannett Fleming, Inc.
Taylor, Wiseman & Taylor, Inc.
New Jersey Department of Transportation
Bureau of Environmental Analysis

December 1993

0203201610

**State of New Jersey
Department of Transportation**

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HOW TO USE THIS MANUAL

This Manual is the third in a series of four (4) Technical Memoranda, each one devoted to a particular aspect of the Route 55 Freeway Extension Feasibility Study. The titles of the four memoranda are as follows:

Technical Memorandum No. 1: Freeway Alignments

Technical Memorandum No. 2: Land Service Improvements and Bypasses

Technical Memorandum No. 3: Environmental Constraints

Technical Memorandum No. 4: Needs Assessment and Traffic Data

The information contained within each of the above mentioned memoranda has been summarized in a fourth report entitled Final Summary Report.

Technical Memoranda No. 1 & 2 present ten (10) alternative courses of action that attempt to satisfy the Project Need. These memoranda are most useful for determining future conditions should one of the alternates be constructed. Technical Memoranda No. 3 & 4 describe the existing traffic conditions and environmental constraints in detail and define the Project Need. These are most useful for obtaining information regarding existing conditions.

There are two major categories that separate the ten alternates. The first category assumes that a 20± mile four lane extension of Route 55 is constructed along a new alignment that closely parallels the existing Route 47/670/83 corridor. Two alternates (Alternatives 1 & 2) are presented under this category and are described in Technical Memorandum No. 1: Freeway Alignments.

The second major category assumes that several existing roadways within the study limits could be upgraded in lieu of the construction of a Route 55 Extension. Due to the vast number of possibilities this category presents, the category was further broken down into three (3) separate schemes. Scheme 1 provides for the existing Route 47/670/83 corridor to remain as a two lane roadway, but both horizontal and vertical alignment deficiencies are rectified and bypasses of the towns of Port Elizabeth and Dennisville are provided. Scheme 1 is represented by alternatives 3 and 4. Scheme 2 is similar to Scheme 1 except that the existing two lane roadways would be expanded to four lanes. Scheme 2 is represented by Alternatives 5, 5A, 6, and 6A. Finally, Scheme 3 provides for a two lane upgrade along the Route 49/50 corridor and is represented by Alternatives 7 and 7A. All of these alternates are presented and described in Technical Memorandum No. 2: Land Service Improvements and Bypasses.

Both the new freeway extension and the Route 47/670/83 corridor traverse highly sensitive environmental areas and will impact both residential and commercial properties. To simplify the analysis of each alternate's impacts on these resources, the freeway extension and the Route 47/670/83 corridor were divided into four segments labelled A, B, C, and D.

In order to see what impacts each of the alternatives will have on a given area, first determine whether the area in question is nearest to the Route 47/670/83 corridor or the Route 49/50 corridor (refer to the Project Location Map, Plate 1, located in Section I of Technical Memorandum No. 1 & 2). If the area in question is along the Route 49/50 corridor, refer to Section III of Technical Memorandum No. 2. If the area in question is closest to the Route 47/670/83 corridor, refer to Plate 2 in Section I of either Technical Memorandum No. 1 or 2 and determine which Segment (A, B, C, or D) the subject area is contained within. Then refer to Section II of both Technical Memoranda No. 1 and 2 to compare the impacts each of the eight applicable alternatives will have on the area in question.

Note that each alternative is summarized on two pages. The first page gives a brief description of the alternate within the limits of the segment as well as design parameters (typical section, design speed, etc.), serviceability (Levels of Service), and a description of significant intersection improvements and/or interchanges that will be required. The second page is a tabulation of environmental impacts, including impacts to cultural resources, endangered species, wetlands, contamination sites, and socioeconomic, land use, and visual constraints.

It should be noted that Technical Memorandum No. 3: Environmental Constraints is actually a compilation of many smaller reports, each referring to their own set of maps, plans, and figures. In order to simplify the unification of these various reports, a new set of environmental constraint maps was developed and is included in the Appendix of Technical Memorandum No. 3. However, many of the reports still refer to figures and diagrams that were originally submitted with the reports. When these circumstances are encountered, please refer to the new constraint maps located in the Appendix.

Also, several of the reports consider multiple topics (ie.: Wetlands and Endangered Species). Wherever possible, these reports were divided and the fragments placed in their appropriate Subsections in Technical Memorandum No. 3.

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INTRODUCTION

In December of 1990, the Bureau of Preliminary Engineering (BPE) requested the Bureau of Environmental Analysis (BEA) to identify various environmental constraints within a defined study corridor that encompassed parts of three counties (Atlantic, Cumberland, and Cape May) involving eight (8) municipalities. The general limits of the study corridor began at the southern terminus of existing Route 55 and extended southeasterly to the Garden State Parkway in Cape May County.

This extensive study area was highlighted on a series of 10 USGS Quadrangle maps (1:24000 scale), with each technical discipline receiving one set of ten maps. Using these maps as a basis, the respective environmental constraints within the study limits were noted. The environmental constraints identified included:

- Parklands
- Threatened and/or Endangered Species
- Waterways
- Wetlands
- Upland Forests
- Hazardous Waste Sites
- Cultural Resources
- CAFRA/Pinelands' Zones or Areas
- Agricultural Development Areas
- Farmsteads Protected by Eight Year Deed Restrictions
- Proposed Developments

These constraints were identified using various sources within and outside the Department including close coordination with NJDEPE for information concerning Hazardous Waste Sites, Parklands, Threatened or Endangered Species, Wetlands and Cultural Resources. The results of this effort culminated with an extensive environmental inventory mapped on USGS Quad sheets and a series of individual technical reports discussing methodologies and the significance of the constraints identified.

This report, Technical Memorandum No. 3: Environmental Constraints, is a compilation of these smaller technical reports. Several steps were necessary in order to simplify the unification of these various reports and to make the information easier to access. First, the reports were grouped into five major headings: Cultural Resources, Endangered Species, Socioeconomic/Land Use/Visual Constraints, Wetlands Emphasis, and Corridor

Contamination Sites. The structure of this memorandum reflects these divisions. Then the information contained on the ten original USGS Quadrangle maps was compiled onto a new set of six Environmental Constraint Maps entitled:

- Archaeological Sites
- Historic Architecture
- Endangered Species
- CAFRA and Pinelands
- Parks, Forests, and Gamelands
- Wetlands Emphasis

The information shown on the "Archaeological Sites" constraint map was deemed too sensitive to appear within this report and was sent to the Department as a separate submission. The other five constraint maps, along with a "Composite Overlay" map showing all constraints superimposed simultaneously on a composite of the USGS Quadrangle maps, appear in Appendix A of this technical memorandum.

In general, most of the individual reports that make up this memorandum included either a "Results" or a "Conclusions" section that summarized the highlights of the study. Some of the key conclusions reached included:

1. The entire study area, with the exception of a small area surrounding Route 49 near Millville, is within the New Jersey Pinelands and/or CAFRA Zone. Any alternative crossing these areas would require compliance with the respective policies of the agencies overseeing these environmentally sensitive regions. Important issues which would play a role in determining compliance would involve the overall environmental impact of the alternative, the potential for inducing secondary development in the study area, and the need for the improvement.
2. The majority of the study area is ecologically sensitive with vast wetland areas (approximately 40% of the entire study area), threatened/endangered species present, acres of undeveloped upland forests and several waterways with exceptional water quality.
3. Land use patterns are primarily rural with limited scattered low density residential and small scale commercial uses adjacent to existing roadways. Additionally some moderate density mixed use "clusters" or villages which serve as centers for the surrounding rural areas are also present. These villages date back to and are typical of early settlement patterns of the

eighteenth and nineteenth centuries.

4. Several parks, state forests, and wildlife management areas are also present throughout the study area.

In total, the study area can be characterized as a primarily rural, ecologically and historically significant part of New Jersey that would be sensitive to any major new development.

As part of the initial identification of environmental constraints, letters were sent to several Federal and State environmental/permitting agencies to obtain "any relevant technical information and agency policy statements regarding the extension of Route 55". Even though these letters were submitted prior to the development of the various alternatives, they did acknowledge the environmentally sensitive nature of the study area, and noted their respective concerns regarding the development of various impact analyses. Key responses were received from the New Jersey Pinelands Commission, and NJDEPE which are summarized below:

New Jersey Pinelands Commission

"Any proposal which can not clearly demonstrate that it is intended to primarily serve the needs of the Pinelands could not be approved unless the Commission was to grant a 'waiver of strict compliance'".

"Given the presence of substantial wetlands, endangered species, and major existing and proposed public land holdings it will be difficult to avoid a finding of substantial impairment to the resources of the Pinelands from some or all of the possible alternatives. Such a finding would preclude development of that alternative.".

NJDEPE

"The proposed extension could adversely impact sensitive environmental resources in the study area as well as the potential to further degrade/impact upon natural resources and conservation lands".

Other responses from U.S.Environmental Protection Agency, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, and U.S. Department of the Interior all indicate their awareness of the environmental sensitivity of the study area, and their concern for impacts to wildlife, wetlands, water quality, and secondary development. A copy of these "early coordination" response letters may be found in the Appendices of Technical Memorandum No. 1: Freeway Alignments and Technical Memorandum No. 2: Land Service Improvements and Bypasses.

SUBSECTION II-A

Cultural Resources

NEW JERSEY DEPARTMENT OF TRANSPORTATION
===== MEMORANDUM =====

Charles A. Ashton for

To: Elkins Green

From: Lauralee Rappleye-Marsett

Subject: Rt. 55 Extension:
Environmental Sensitivity Studies

Date: April 30, 1991

Enclosed for your use are the archaeological and historic architectural environmental sensitivity studies for the Route 55 Extension project. For each discipline the product consists of a set of USGS quad maps and a narrative.

Because some of the information contained in these documents is sensitive and is not to be distributed outside the Department, both sets of maps should be returned to the Cultural Resources group after use.

If you have any questions please call me (5-2990), Janet Fittipaldi (5-5462) or Charles Ashton (5-5466).

cc: D. Cox
J. Fittipaldi

CHA:tm

**ROUTE 55 FREEWAY EXTENSION
CAPE MAY AND CUMBERLAND COUNTIES
ARCHEOLOGICAL RESOURCES**

I. INTRODUCTION

The New Jersey Department of Transportation has undertaken a study for the proposed extension of the Route 55 Freeway. As an internal memorandum has stated, the extension will serve primarily as a seasonal route to the shore communities in Cape May County; because of this limited use, the permitting agencies have requested that secondary impacts of such a roadway be studied (Cox 12/26/90 MTR). To this end, broad study areas have been delineated by the Division of Project Planning and Development on ten contiguous USGS quadrant sheets (Fig. 1). One alignment will be chosen once all the social, economic, and environmental constraints have been considered. This particular component of the multi-disciplined study identifies existing and potential archeological resources within the study areas.

II. PROJECT DESCRIPTION

The proposed project consists of two study areas within ten USGS quadrants: 1) a new Route 55 Freeway alignment and the existing roadway alternatives (Routes 47, 670, and 83); and 2) existing roadway alternatives (Routes 49 and 50). The first study area includes not just the existing and proposed roadway corridors but additional areal coverage as outlined in the accompanying map index (see fold-out). The second study area is subdivided into two parts: a) a 1000' corridor, 500' either side of the centerline, of the existing Rt. 49 and Rt. 50 roadways; and b) the junction of Rts. 49 and 50 within the town of Tuckahoe (see fold-out).

III. PHYSICAL ENVIRONMENT

The study areas lie in the Outer Coastal Plain. The Outer Coastal Plain is one of the five physiographic provinces of New Jersey. It lies to the east of the cuesta which separates the Inner and Outer Coastal Plains. The rivers and creeks of the Outer Coastal Plain drain to the east, the south, or the southeast -- the only exception is the Rancocas River and its tributaries which flow westward into the Delaware River. The main water courses in the study areas are the Manumuskin, the Maurice, the Manantico, West and East creeks, Dennis Creek, the Tuckahoe River, and Cedar Swamp Creek. The two major swamps are the Great Cedar Swamp lying in both Upper and Middle townships, and Timber and Beaver Swamp in Middle Township.

The unconsolidated sand and gravel deposits date to the interglacial time but unlike those in the Inner Coastal Plain these sediments overlie Tertiary sedimentary deposits. The topography has been reworked by the changes in sea level between glacial and interglacial periods and on-going wind and wave erosion and subsequent deposition (Buell and Robichaud: 45-52). The soils of the Outer Coastal Plain are sandier than those of the Inner Coastal Plain. The soil associations identified by the United States Department of Agriculture, Soil Conservation Service are the following: in the Cumberland County portion of the study areas Aura-Downer-Sassafras, Hammonton-Fallsington-Pocomoke, Evesboro-Klej-Lakewood, and Muck-Atsion-Berryland can be found; in Cape May County, Downer-Sassafras-Fort Mott, Hammonton-Woodstown-Klej, Pocomoke-Muck, and Tidal Marsh .

IV. BACKGROUND RESEARCH

The intent of this project was to identify previously recorded archeological sites within the study areas and those locations also within the study areas that have the potential of producing archeological resources. No subsurface testing was conducted.

A number of cultural resources surveys have been performed in the study areas. The New Jersey Department of Environmental Protection-Office of New Jersey Heritage houses the indices to these studies and, in most cases, the actual survey reports/maps. Three inventories pertinent to the study areas were consulted. Two of these comprehensive surveys were contracted by the Pinelands Commission in 1980; the other, by the New Jersey Department of Environmental Protection-Office of Green Acres and the Office of Cultural and Environmental Services in 1982. These comprehensive surveys drew their information from historic maps, records, earlier surveys, actual field survey, and informants. The Pinelands Commission's sponsored **Historical Archaeological Resources of the Pinelands**, compiled by Barbara Liggett and Budd Wilson, contains all historic resources known to exist within the political boundaries of the Pinelands National Reserve. The **Prehistoric Archaeological Resources of the Pinelands** contains all prehistoric resources reported for the Pinelands National Reserve. These two inventories were conceived as and are used as management tools for the Commission's permitting function. The third inventory is Mounier's **Survey of the Cultural Resources of the Historic Era in the Watersheds of the Great Egg Harbor and Tuckahoe Rivers**. It was compiled, again, as a management tool and also as part of the preparation for the nomination of the watersheds to the U.S. Department of the Interior's National Wild and Scenic River System.

Additional cultural resources surveys transmitted to the Office of New Jersey Heritage (ONJH), informant information, and windshield surveys conducted by BEA's Cultural Resources staff augmented the findings of the above inventories.

V. METHODOLOGY

The resources have been placed on 7.5 minute USGS quadrants of the study areas and separate listings for each quad sheet of all known and potential archeological resources contained on that quad sheet have been compiled. Each previous survey has devised its own numbering system for recordation purposes; therefore, no attempt was made to deviate from those systems. In this way, a researcher can look at the BEA USGS quad, know from what source the resource was obtained, and go to that source for further information on the site. A word of caution: many of the site locations are not accurately outlined but are broadly delineated due to confidentiality of site location; because of this, it is always a wise idea to refer to the verbal description of a site and to conduct a field check. For the purpose of this project, however, overlays of existing inventory maps were created without benefit of a field check of each previously identified resource.

The survey and the recording system are as follows:

Historical Archaeological Resources of the Pinelands -

Represented by a yellow circle or filled triangle on the quad sheet. (The triangles indicate historic transportation systems.) Each quadrant has been assigned a numerical prefix, for example Port Elizabeth is #42; the resources within that quad have been numbered sequentially. For example, "42-1" is the first identified resource on quad sheet #42.

Prehistoric Archaeological Resources of the Pinelands -

Represented on the quad sheet by a red configuration with black crosshatching. Each collector has been given his own alphabetical prefix, for example "I"; the resource has been given a numerical indicator (these numbers are not necessarily in sequential order). For example, "I-24" is a site identified by collector "I".

Survey of the Cultural Resources of the Historic Era in the Watersheds of the Great Egg Harbor and Tuckahoe Rivers -

Represented by a black circle on the quad sheet. The four number prefix is the United States Department of Agriculture designation for a particular county and municipality within that county; for example, Upper Township in Cape May is represented as 0511 (05 for Cape May County and 11 for Upper Township). The resources within that municipality have been assigned numbers.

Cultural resource surveys - These surveys are on-file at ONJH and are represented on the quad sheets by a dot and dash encompassing the project area. Each agency commissioning the survey has been assigned a letter, for example USDOT(FHWA)/NJDOT is "F". The report has

been given a numerical indicator which follows the letter.

Informants and other sources - These sites are outlined in green and have been assigned a letter-number combination. They can be found on the New Jersey Atlas sheets at BEA.

Potential sites - These sites have been identified by BEA - Cultural Resources staff through recent windshield surveys conducted specifically for this project. The potential historic resources are represented by exaggerated black triangles. The potential prehistoric sites are represented by exaggerated black rectangles.

It must be noted that the likelihood of finding both historic and prehistoric subsurface resources at the sites of standing historic structures adjacent to water is very high; therefore, entire towns and individual house sites have been identified and are included within this inventory as having the capacity to yield subsurface resources. Studies elsewhere have shown continuity in site locations between prehistoric and historic resources, especially in localities proximal to drainages such as are found in the Outer Coastal Plain. Additionally, it is expected that the back, front, and side yards of extant historic structures identified in the architectural survey will contain subsurface features dating from historic occupation(s) of the property. Individual house sites identified in the architectural survey have not been redelineated in this survey.

VI. RESULTS AND CONCLUSIONS

A total of 53 potential aboriginal site locations have been identified within the study areas. Likewise, 32 previously identified aboriginal sites have been recorded for the study areas. Twenty-five potential historic sites have been located; 50 historic sites have been recorded. These numbers reflect the potential and the known within the broad study areas. Whatever alignment is chosen, a comprehensive survey using all the components mentioned in Sections IV. and V. in addition to systematic subsurface testing must be conducted.

VII. LIST OF WORKS CONSULTED

Cavallo, John et al.

- 1980 **Prehistoric Archaeological Resources of the Pinelands**
prepared for the New Jersey Pinelands Commission.

Cross, Dorothy

- 1941 **Archaeology of New Jersey, Volume 1.**
Trenton: Archaeological Society of New Jersey and New
Jersey State Museum.

Liggett, Barbara and Budd Wilson

- 1980 **Historical Archaeological Resources of the Pinelands.**
prepared for the New Jersey Pinelands Commission.

Mounier, R. Alan et al.

- 1982 **Survey of the Cultural Resources of the Historic Era
in the Watersheds of the Great Egg Harbor and Tuckahoe
Rivers** prepared for the Office of Green Acres and the
Office of Cultural and Environmental Services, New
Jersey Department of Environmental Protection.

Robichaud, Beryl and Murray F. Buell

- 1973 **Vegetation of New Jersey: A Study of Landscape
Diversity.** Rutgers University Press. New Brunswick,
New Jersey.

Schrabisch, Max

- 1915 **Archaeological Survey of New Jersey, Bulletin 13
of the Geological Survey of New Jersey.**
Union Hill, NJ: Dispatch Printing Co.

-
- 1917 **Archaeological Survey of New Jersey, Bulletin 18
of the Geological Survey of New Jersey.**
Trenton, NJ: MacCrellish and Quigley.

Skinner, Alanson and Max Schrabisch

- 1913 **Archaeological Survey of New Jersey, Bulletin 9
of the Geological Survey of New Jersey.**
Trenton, NJ: MacCrellish and Quigley.

United States Department of Agriculture, Soil Conservation
Service

- 1977 **Soil Survey of Cape May County, New Jersey.**

-
- 1978 **Soil Survey of Cumberland County, New Jersey.**

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**ROUTE 55 EXTENSION
CAPE MAY AND CUMBERLAND COUNTIES
ARCHEOLOGICAL RESOURCES**

page 1

ROUTE 55 EXTENSION
CAPE MAY AND CUMBERLAND COUNTIES
ARCHEOLOGICAL RESOURCES

DIVIDING CREEK

2 Potential Aboriginal sites
1 Potential Historic site

page 2

ROUTE 55 EXTENSION
CAPE MAY AND CUMBERLAND COUNTIES
ARCHEOLOGICAL RESOURCES

FIVE POINTS

1 Potential Aboriginal site
0 Potential Historic sites

ROUTE 55 EXTENSION
CAPE MAY AND CUMBERLAND COUNTIES
ARCHEOLOGICAL RESOURCES

HEISLERVILLE

10 Potential Aboriginal sites
0 Previously recorded Aboriginal sites

2 Potential Historic sites
4 Previously recorded Historic sites:

47-3 East Creek Mill:Dennis Twp.
47-4 West Creek Mill:Dennis Twp.
47-5 Hands Mill:Maurice River Twp.
47-8 Eldora:Dennis Twp.

ROUTE 55 EXTENSION
CAPE MAY AND CUMBERLAND COUNTIES
ARCHEOLOGICAL RESOURCES

MARMORA

4 Potential Aboriginal sites
0 Previously recorded Aboriginal sites

0 Potential Historic sites
4 Previously recorded Historic sites:

44-8 Middletown:Upper Twp.
44-10 Petersburg:Upper Twp.
44-14 Cape May-Millville RR

0511-7 Baptist Church:Upper Twp.

funded such surveys for several years, with the goal of identifying all historic properties in the state. Surveys are usually conducted on a county or municipal basis, although other rationales have been used. In the Route 55 study area, the following municipalities have previously been surveyed:

TABLE 1
Areas Previously Surveyed

County	Municipality
Atlantic	Estell Manor Corbin City
Cape May	Middle Township Upper Township

ONJH surveys typically are conducted by qualified architectural historians who generally employ the criteria of the National Register of Historic Places. Properties are recorded using a standardized survey form, including a map and a photograph. Each surveyed property is characterized by the surveyor as being eligible for inclusion in the National Register, possibly eligible, or not eligible.

In addition, properties which are old but are of less architectural significance (including those which have lost significance due to alterations) are generally recorded by a technique known as "listing." A listing usually includes no more information than the building's location, a short description, and a photograph; it is little more than a notation of the building's existence. A "listed" property could conceivably be elevated to full survey status based on rehabilitation/restoration activities or further research revealing greater significance than was apparent at the time of the initial survey.

On the assumption that ONJH exercises sufficient control over the surveys it funds, and because of similarities in survey methodology, the municipalities shown in Table 1 were not re-surveyed for the Route 55 project. Instead, the results of the surveys were obtained from records on file at ONJH and plotted on the enclosed maps.

2. National Register Properties

The study area contains a number of properties which are already listed in the National Register of Historic Places; any further identification activities with respect to them would be redundant. These properties are listed in Table 2.

TABLE 2
Properties Listed in the National Register of Historic Places

Municipality	Property
Estell Manor	Head of the River Church Rt. 49 at Aetna Drive (Tuckahoe quadrangle)
Dennis	Calvary Baptist Church Rt. 9 at Seaville Road (Sea Isle City quadrangle) Dennisville Historic District (Woodbine quadrangle) William S. Townsend House 96 Delsea Drive (Woodbine quadrangle)
Middle	New Asbury Methodist Episcopal Meetinghouse Rt. 9 (Woodbine quadrangle)
Upper	Marshallville Historic District Rt. 49 to Tuckahoe River (Tuckahoe quadrangle) Tuckahoe Railroad Station Railroad Avenue (Tuckahoe quadrangle)
Woodbine	Woodbine Brotherhood Synagogue 612 Washington Avenue (Woodbine quadrangle)

The locations of all of these properties are plotted on the enclosed maps.

3. Bridges

A. State Highway System Bridges

A computer search was conducted of the New Jersey Bridge Inventory to identify all bridges on the state system within the study area which are at least (a) 20 feet long and (b) 50 years old. The results are listed in Table 3.

TABLE 3
Bridges on the State Highway System 50 Years Old or Older

Bridge No.	Location
0110-150	Rt. 49 over Tuckahoe River, Estell Manor
0508-150	Rt. 47 over Dennis Creek, Dennis
0508-151	Rt. 47 over branch Dennis Creek, Dennis
0507-153	Rt. 47 over Sluice Creek, Middle
0510-151	Rt. 50 P.R.S.L. railroad overpass, Upper
0509-151	Rt. 49 P.R.S.L. railroad overpass, Upper
0510-152	Rt. 50 Tuckahoe River Draw, Upper
0601-150	Rt. 47 over Muskee Creek, Maurice River
0601-151	Rt. 47 over Manumuskin Creek, Maurice River
0601-152	Rt. 47 Manantico Creek Draw, Millville
0606-150	Rt. 49 over Manantico Creek, Millville

All of the above bridges are plotted on the enclosed maps, with the exception of Bridges 0508-150 and 0508-151 which are both within the Dennisville Historic District.

One bridge in the study area has previously been determined to be ineligible for inclusion in the National Register: Bridge 0512-150, Rt. 83 over P&R Railroad, Dennis. It was not mapped.

E. Off-System Bridges

No systematic effort was made to identify off-system (i.e., county or municipal) bridges beyond the methods employed to locate historic buildings. Bridges encountered in the field survey were examined for evidence of a construction date or other items of interest. Where warranted, these bridges were included on the survey maps.

Field Investigation

1. Criteria Used

The intent of the field investigation was to identify and map all potentially historic properties in the parts of the study area which have not previously been surveyed. Accordingly, all roads in the study area were travelled by car, with the following exceptions:

- A. Roads on which no buildings appeared on the topographic maps.
- B. Secondary streets within built-up areas.

The criteria used to determine whether a particular property was included in the survey findings were loosely based on those used by the National Register of Historic Places. Buildings of obvious age ("age" being defined as 50 years or more), which retain integrity of design and materials, were noted on the topographic maps. Buildings clearly less than 50 years of age and older structures which have been altered so as to diminish their architectural integrity (i.e., buildings whose eligibility for inclusion in the Register could be immediately ruled out) were not mapped.

All cemeteries shown on the topographic maps were inspected on foot, and all are noted on the enclosed maps regardless of age. One cemetery, on the east side of Route 9 near the Upper-Dennis boundary, is not printed on the topographic map.

Limitations of the Study

The potential flaws in the above methodology are believed to be few and minor. First, if a given topographic map is in error in showing no structures on a given road, that road was not surveyed in the field. This is considered highly unlikely. Second, several roads in the study area, notably in Maurice River Township east of Route 47, are private and inaccessible. "No Trespassing" signs were respected by the field surveyors. Third, either of the above types of roads may include bridges more than 50 years old, which would have been noted had the roads been surveyed. Fourth, confidence in the survey results in the four municipalities previously

surveyed rests on faith in the skills of individuals who are not part of the present effort: the persons who conducted previous surveys for ONJH.

The fact that secondary streets in built-up areas were not surveyed is not considered a limitation. Any built-up area which would be impacted by the project would require a detailed, building-by-building inventory to determine if an historic district exists its extent. This level of detail is beyond the scope of the present study, and built-up areas requiring further study were roughly outlined on the maps.

FINDINGS

Note on Mapping Conventions

The maps enclosed with this report contain the results of the investigation described above. All properties identified through review of prior surveys, review of National Register data, computer search of the New Jersey Bridge Inventory and field activities are shown. In general, the building of interest is within a red circle. Any pertinent information is adjacent to the circle. For instance, properties identified in ONJH surveys are routinely assigned a number at the time of the survey, consisting of a four-digit number uniquely identifying the county and municipality, followed by a one-, two- or three digit number in sequence within that municipality. Thus, the ninth property surveyed in Estell Manor, for instance, would be labelled 0106-9. "Listings" are similarly labelled, but the survey number always includes the letter "L." The ninth listing recorded in Estell Manor would therefore be labelled 0106-L9 near the red circle on the map. It is important to note that 0106-9 and 0106-L9 denote two different properties.

In previously-surveyed areas which are densely populated with historic buildings, the red circles were abandoned in favor of red lines extending from the building to the survey number.

Where the resource clearly consists of a number of structures (such as a farm complex), an effort was made to encircle all related buildings. In some instances this necessitated the use of a larger circle. Likewise, where there are many adjacent but unrelated buildings in close proximity (such as certain parts of Route 9), smaller circles were used to minimize overlap. The size of the circle, however, has no significance.

National Register properties are labelled "NR" in red. Historic districts are outlined in red, with the "NR" label within the red line.

Built-up areas which were not surveyed on a building-by-building basis--Woodbine and Port Elizabeth, for example--are enclosed by red lines. These should not be confused with the historic

districts listed in the National Register, and the description of each quad sheet which follows should clarify this.

All on-system bridges in Table 3 are labelled on the maps with their bridge numbers except the two bridges in the Dennisville Historic District.

Users of the maps are warned that they are not engineering documents, and errors may be present. This is a particular danger in the case of historic district boundaries, which may be plotted on maps in ONJH's files with a precision that is not possible at this scale.

General Findings

It is believed with a high degree of confidence that virtually every building in the study area has been seen by an architectural historian, either in previous surveys or during the present effort (with the exception of buildings located on inaccessible roads or those on secondary streets in built-up areas). Accordingly, the enclosed maps are reasonably believed to depict virtually all historic or potentially historic structures in the study area.

In general, the study area can be characterized as a series of historic settlements linked by equally historic roads. To the 20th century motorist accustomed to thinking of Route 47 as "the road to the shore," lined with gas stations and convenience stores, it may be surprising to learn that what is today the Routes 47/670/83 corridor is comprised of extremely historic roads. In fact, some of the oldest structures in the study area are on Route 47 south of Dennisville, and even a cursory, high-speed observation shows that there are a great many historic buildings extant.

Likewise, Route 9 has been the Shore Road linking Cape May to points north at least as long as Europeans have been in New Jersey. It, too, is not a product of the automobile age.

While other parts of the state (and even the immediate region) have witnessed strong development pressure in recent years, new construction to the degree found elsewhere is largely (but not totally) absent. Thus, historic buildings comprise a high proportion of the structures present.

Many properties identified are two-story, frame houses apparently built in the 19th century, but the study area exhibits a high degree of diversity in its historic architectural resources. The full spectrum includes such disparate findings as an early tourist court on the west side of Route 47 south of Bricksboro, ("early" in this case meaning early 20th century), a cemetery dating from the 18th century (Route 670 south of Route 550), and a railroad station (Tuckahoe).

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ROUTE 55 EXTENSION
CAPE MAY AND CUMBERLAND COUNTIES
ARCHEOLOGICAL RESOURCES

MILLVILLE

- 0 Potential Aboriginal sites
- 0 Previously recorded Aboriginal sites

- 0 Potential Historic sites
- 0 Previously recorded Historic sites:

ROUTE 55 EXTENSION
CAPE MAY AND CUMBERLAND COUNTIES
ARCHEOLOGICAL RESOURCES

PORT ELIZABETH

15 Potential Aboriginal sites

16 Previously recorded Aboriginal sites:

C114
E25
E26
E45
G91
G92
I24
I25
I26
J59
J60
R208
V1
V2
V5
V6

7 Potential Historic sites

14 Previously recorded Historic sites:

42-1 Cumberland Furnace:Maurice River Twp.
42-2 Hesstown: "
42-3 Ormond: "
42-4 Manumuskin: "
42-5 Port Elizabeth: "
42-6 Bricksboro: "
42-9 Hoffmans Mill: "
42-10 Jones Mill: "
42-12 Mauricetown Station: "
42-13 Little Mill: "
42-15 Halberton: "
42-16 Comptons Ferry Road: "
42-17 Fries Mill: "
42 T-3 Cape May-Millville RR

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ROUTE 55 EXTENSION
CAPE MAY AND CUMBERLAND COUNTIES
ARCHEOLOGICAL RESOURCES

RIO GRANDE

Outside current study area.

ROUTE 55 EXTENSION
CAPE MAY AND CUMBERLAND COUNTIES
ARCHEOLOGICAL RESOURCES

STONE HARBOR

4 Potential Aboriginal sites

8 Previously recorded Aboriginal sites

U24

U25

5 sites reported by R. A. Mounier (1988:AGC)

1 site reported by J.A. Fittipaldi

0 Potential Historic sites

2 Previously recorded Historic sites:

2 sites reported by R. A. Mounier (1988:AGC)

ROUTE 55 EXTENSION
CAPE MAY AND CUMBERLAND COUNTIES
ARCHEOLOGICAL RESOURCES

SEA ISLE CITY

- 2 Potential Aboriginal sites
- 6 Previously recorded Aboriginal sites:

- U18
- U19
- U20
- U21
- U22
- U23

- 0 Potential Historic sites
- 4 Previously recorded Historic sites:

- 49-1 Oceanview (Townsend):Dennis Twp.
- 49-2 Seaville:Upper Twp.
- 49-4 Greenfield:Upper Twp.
- 49 T-3 Cape May-Millville RR

ROUTE 55 EXTENSION
CAPE MAY AND CUMBERLAND COUNTIES
ARCHEOLOGICAL RESOURCES

TUCKAHOE

- 5 Potential Aboriginal sites
5 Previously recorded Aboriginal sites:

E43
N-1
U-1
U-2

0106-6 Aboriginal cemetery:Corbin City

- 0 Potential Historic sites
13 Previously recorded Historic sites:

43-1 Head-of-River:Estell Manor City
43-4/ Hunters Mill: "
0109-5 Hunters Mill: "
43-7 Belleplain:Dennis Twp.
43-9 Corbin City:Corbin City
43-10 Tuckahoe:Upper Twp.
43-11 Marshallville:Upper Twp.
43-12 Godfreys Mill:Upper Twp.
43-14/ Randall Marshalls Mills:Upper Twp.
0511-3 Saw and Grist Mills: "
43-17 Benzetts Mill:Upper Twp. & Estell Manor City
43 T-3 Cape May-Millville RR

0511-20 Godfrey's Twin Sawmill Ponds:Upper Twp.
0511-38 Marshallville Glassworks:Upper Twp.
0511-39 Marshallville Limekiln:Upper Twp.

ROUTE 55 EXTENSION
CAPE MAY AND CUMBERLAND COUNTIES
ARCHEOLOGICAL RESOURCES

WOODBINE

14 Potential Aboriginal sites
5 Previously recorded Aboriginal sites:

E36
G91
U4
U5
U6

15 Potential Historic sites
11 Previously recorded Historic sites:

48-1 Woodbine:Woodbine
48-2 Woodbine Junction: "
48-3 Mt. Pleasant: "
48-4 North Dennis:Dennis Twp.
48-5 Dennisville: "
48-6 South Dennis: "
48-7 Clint Mill Pond:Dennis Twp. & Middle Twp.
48-8 South Seaville:Dennis Twp.
48-9 Cedar Grove: "
48-10 Clermont: "
48-11 Swanton:Middle Twp.

RT55 FREEWAY STUDY AREA

USGS QUAD SHEET INDEX

MILLVILLE 1	FIVE POINTS 2		
DIVIDING CREEK 3	PORT ELIZABETH 4	TUCKAHOE 5	MARMORA 6
	HEISLERVILLE 7	WOODBINE 8	SE AISLE CITY 9
		STONE HARBOR 10	

ROUTE 55 EXTENSION
ENVIRONMENTAL SENSITIVITY STUDY:
HISTORIC ARCHITECTURE

INTRODUCTION

This report presents the results of an environmental sensitivity study conducted to identify historic architectural resources which could be affected by constructing an extension of Route 55 from Millville, Cumberland County to the Garden State Parkway in Cape May County, or by the improvement of existing roadways in the same corridor. The purpose of the study was to identify historic architectural resources which could constrain the location and alignment of the freeway or which could affect the decision to improve existing roadways.

The study was carried out in February and March of 1991, and consisted of a review of existing surveys as well as field investigations. The results of the investigation and the boundaries of the study area were plotted on a set of ten 7.5' topographic maps which form the major portion of this report.

The investigation identified numerous historic architectural resources which could constrain improvements to existing roadways; construction of a new freeway would encounter fewer resources.

PURPOSE

The Section 106 Process: An Overview

Historic architectural and archaeological resources are protected against damage or destruction resulting from public projects by an interlocking web of state and Federal laws and regulations. Most are related philosophically to the requirements of Section 106 of the National Historic Preservation Act of 1966 (P.L. 89-665). The stated goal of these protective mechanisms is not to prevent the projects from taking place, but to ensure that the project planning includes consideration of the project's effects on historic buildings which may result.

The threshold of significance which a resource must meet to enjoy this protection is listing in, or eligibility for listing in, the National Register of Historic Places. Eligibility judgments are made by the Federal agency sponsoring or funding a project in consultation with the State Historic Preservation Officer (SHPO). Properties are listed in the Register by means of a nomination submitted by the SHPO to the National Park Service.

If a listed or eligible property will be affected by a project, the Federal sponsor (in consultation with the SHPO) ascertains whether

the effect will be adverse. If so, consultation continues to seek ways to avoid or minimize the adverse effects, and the results of this phase of consultation are recorded in a Memorandum of Agreement signed by both parties specifying mitigation measures which will be carried out. The Advisory Council on Historic Preservation (ACHP), an independent Federal agency, is then afforded the opportunity to ratify the Memorandum of Agreement, after which the Federal agency implements the mitigation measures. When mitigation has been completed to the satisfaction of the SHPO and the National Park Service, the project may proceed.

Present Study

Identification of historic structures in a given project's impact area is the first step in the process, and identification begins with a broadly-based, visually-oriented inventory. This "first cut" is designed to locate all buildings which appear to have the potential to be designated as historic (depending on the results of detailed research), and which could thus necessitate consideration during later stages of project planning.

The present study constitutes the first stage of the identification process for the Route 55 project. The purpose, therefore, was to locate all previously-designated or potentially historic buildings in the study area. As project plans are developed in more detail and impact areas more narrowly defined, further research will separate those buildings which are merely old from those which are eligible for listing, after which consultation with the SHPO can take place.

METHODOLOGY

Definition of Study Area

The study area was defined by others prior to the commencement of the survey, and was delineated on 1:24,000 topographic maps. In general, it consisted of two elements: a broad swath stretching from Millville to the Parkway, and the combination of Route 49 from Millville to Tuckahoe and Route 50 from Tuckahoe to Route 9 at Seaville. In the latter element, only the area 500 feet on either side of the existing road was considered, although the study area was enlarged in the Marshallville/Corbin City/Tuckahoe area. The entire study area is depicted on the attached maps.

Review of Existing Studies

1. Office of New Jersey Heritage Surveys

Parts of the study area have previously been the subject of historic architectural surveys. The Office of New Jersey Heritage (ONJH, within the New Jersey Department of Environmental Protection) has

Several of the properties on the maps could eventually be determined to be eligible for inclusion in the National Register (and the vast majority would probably be determined to be ineligible), but one resource was discovered whose eligibility is beyond question. This is the Seaville Camp Meeting, just south of South Seaville on the west side of South Dennis-Ocean View Road in Dennis Township. The property contains dozens of camp meeting cottages, apparently built starting in the 1870's and similar to those which survive at other camp meetings such as Island Heights, Ocean City and Ocean Grove.

Detailed Findings:

The information collected in the course of the study is depicted on the accompanying maps. However, the following list contains the highlights of the data on each quad sheet.

1. Millville Quad

National Register Properties: None.

Remarks: Only a small portion of this quad is in the study area.

2. Five Points Quad

National Register Properties: None.

Remarks: Very little of the quadrangle is in the study area. In Millville proper, virtually all of the buildings in the study area are post-war. Bridge 0606-150 is on Route 49 east of Millville.

3. Dividing Creek Quad

National Register Properties: None.

Remarks: Bridge 0601-152 is on Route 47 at the Millville-Maurice River boundary.

4. Port Elizabeth Quad

National Register Properties: None.

Remarks: Bridges 0601-151 and 0601-150 are on Route 47, and there is a county bridge on Route 548 east of Port Elizabeth.

Port Elizabeth, Bricksboro and the small settlement north of Port Elizabeth on Route 47 are all historic, and would require detailed investigations if construction is anticipated in these areas.

5. Tuckahoe Quad

National Register Properties: Head of the River Church, Route 49 at Aetna Drive, Estell Manor; Tuckahoe Railroad Station, Railroad Avenue, Tuckahoe; Marshallville Historic District, Upper Township.

Remarks: The Marshallville-Corbin City-Tuckahoe nexus is thick with historic resources. It seems likely that as-yet undefined historic districts may exist in both Corbin City and Tuckahoe. Bridge 0510-152 carries Route 50 over the Tuckahoe River.

6. Marmora Quad

National Register Properties: None

Remarks: Only a small segment of this quadrangle is in the study area, but there are several properties on Route 50 identified in the ONJH files. One of these, at the junction of Route 50 and Tuckahoe Road (Middletown), is mysteriously labelled not with a survey number but only as "Post 72." This designation was preserved on the project map. Petersburg is also thick with resources and may constitute an historic district. Bridge 0510-151 carries Route 50 over the Pennsylvania-Reading Seashore Line tracks north of Petersburg.

7. Heislerville Quad

National Register Properties: None

Remarks: There are several properties of interest near Pickle Factory Pond.

8. Woodbine Quad

National Register Properties: Dennisville Historic District, Dennis; New Asbury Methodist Episcopal Meetinghouse, Route 9, Middle; Woodbine Brotherhood Synagogue, Woodbine; William Townsend House, 96 Delsea Drive, Dennisville.

Remarks: This quadrangle is perhaps the most densely populated with historic structures of any in the study area. The Seaville Camp Meeting in South Seaville has already been noted. Other structures of note are a house on the north side of Route 47, west of the Route 670 intersection and apparently directly in the path of the proposed Route 55 extension, and concentrations of buildings near Ludlams Pond and Johnson Pond, both on Route 47.

South Seaville proper, Cedar Grove, South Dennis and Woodbine are all outlined in red on the map. This is to indicate that concentrations of historic buildings are present, and that detailed investigations would be necessary should construction be anticipated in these areas. None is presently included in the National Register.

Dennisville, by contrast, is listed in the National Register, and the district boundary (shown on the map) includes both Bridge 0508-150 and 0508-151. Because both bridges are within the district boundary, neither is specifically labelled on the map.

9. Sea Isle City Quad

National Register Properties: Calvary Baptist Church, Route 9 at Seaville Road, Dennis.

Remarks: The primary feature of this quadrangle is Route 9. It was already a major thoroughfare for the region when Europeans arrived, and remained so until construction of larger highways in the 20th century. It is virtually a living museum of large and small houses of the 18th and 19th centuries.

10. Stone Harbor Quad

National Register Properties: None.

Remarks: The tiny segment of study area on this quad nonetheless contains three identified properties.

CONCLUSIONS

People build buildings near transportation routes, whether riverine or terrestrial. Because of this propensity, more historic buildings were found adjacent to existing roads than in the swath traversed by the proposed Route 55 extension. This is evident from even a cursory review of the maps. Furthermore, people have been building along the roads in the project area for centuries; thus, the historic resources present relate to several phases of historic development including settlement, subsistence (agricultural and water-based), self-contained villages, and automobile-based tourism.

When project decisions have been made, the next phase of the architectural survey will consist of detailed investigations of buildings which could be affected by the narrower project area, leading either to determinations of eligibility or decisions that particular buildings are merely old but not historically or architecturally significant.

However, it is apparent from this study that the proposed alignment of Route 55 would require property from one resource already listed in the National Register: the Dennisville Historic District. If this is indeed the case, construction on this alignment would require the consultation required by Section 106 as outlined earlier.

Prepared by
Charles H. Ashton
Principal Environmental Specialist

SUBSECTION II-B

Endangered Species



United States Department of the Interior
FISH AND WILDLIFE SERVICE

IN REPLY REFER TO:
SP91/563

Fish and Wildlife Enhancement
927 North Main Street (Bldg. D)
Placasantville, New Jersey 08232
(609) 646-9310

July 11, 1991

Mr. F. Howard Zahn, Director
Division of Project Development
New Jersey Department of Transportation
1035 Parkway Avenue
CN 600
Trenton, New Jersey 08625

Dear Mr. Zahn:

This responds to your May 30, 1991, letter inviting Fish and Wildlife Service (Service) participation in a pre-National Environmental Policy Act scoping process regarding the proposed extension of New Jersey Route 55 (Route 55) in Cumberland and Cape May Counties, New Jersey.

This report provides technical assistance only and does not represent the review comments of the Department of the Interior on any forthcoming environmental statement or permit applications pursuant to the Fish and Wildlife Coordination Act (48 Stat. 401, 16 U.S.C. 661 et seq.).

We understand, in response to a need for increased capacity in the study area to accommodate seasonal shore traffic during the summer months, the New Jersey Department of Transportation (DOT) is currently studying the feasibility of extending Route 55 from its present southern terminus at New Jersey Route 47 (Route 47) in Cumberland County, to the vicinity of the Garden State Parkway in Cape May County. No distinct alignment or alternative has yet been developed; however, the study corridor is identified in a map (Figure 2) enclosed with your May 30th letter.

As part of the study process, the DOT is gathering information on sensitive environmental resources in the study corridor that will be used in a planning decision to extend Route 55 or pursue other alternatives to increase traffic capacity. To assure that all important environmental issues and agency policies are considered in developing a recommended alternative, the DOT is also asking for any relevant technical information and agency policy statements regarding the planned extension of Route 55.

The Service recommends that any forthcoming decision on extending Route 55 fully consider the direct and indirect impacts of the proposed project on fish and wildlife resources. Specifically, the Service is concerned about direct or indirect impacts to the following: lands comprising the Cape May National Wildlife Refuge, including all lands yet to be acquired; other designated environmentally sensitive properties or areas; State and federally listed endangered or threatened species; "focus areas" listed under the North

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American Waterfowl Management Plan; "important, scarce, and vulnerable wetlands" listed in accordance with the Emergency Wetlands Resources Act; and, palustrine and estuarine wetlands and all other valuable natural resources identified in the study area.

In an effort to identify the important resources potentially at risk by this project, the Service provides the following information for use in your decision making process.

CAPE MAY NATIONAL WILDLIFE REFUGE

The enclosed maps depict the proposed boundaries of the Great Cedar Swamp and Delaware Bay Divisions of the Cape May National Wildlife Refuge. Both Divisions are within the study area identified in Figures 1 and 2 of your letter. The approved boundary of the Great Cedar Swamp Division extends from north of where Cape May County Route 631 crosses Cedar Creek to South Dennisville-South Seaville Road and to Route 47 where it crosses Dennis Creek. The approved acquisition boundary of the Delaware Bay Division extends from Goshen-Swainton Road almost to the intersection of Route 47 and U.S. Route 9. When acquisition is completed, the newly created refuge will encompass over 15,000 acres. The Service is actively pursuing acquisition at this time. In excess of 4,000 acres have been purchased to date.

Several existing roads shown on the Route 55F Extension Needs Assessment Study Area map (Figure 2, enclosed with your May 30 letter) either traverse the Great Cedar Swamp Division acquisition area (New Jersey Route 50 and Cape May County Route 550) or function as part of the refuge acquisition boundary (Route 47 and Cape May County Route 610). Some of these roads also traverse the Delaware Bay Division acquisition area (Route 47 and Cape May County Route 618).

It is the Service's policy to discourage the types of uses embodied in right-of-way requests through refuge properties; for example, roads, powerlines, and pipelines. If a right-of-way cannot be certified as compatible with the purposes for which the refuge was established, the right-of-way cannot be granted without authorization by Congress. The term "compatible" means that the requested right-of-way or use will not interfere with or detract from the purposes for which the unit of the National Wildlife Refuge System was established. A determination of compatibility or noncompatibility cannot be made in an arbitrary manner and must be supported by facts. The facts can best be presented in an environmental assessment (EA) or environmental impact statement (EIS). A determination of compatibility with the purposes for which a refuge was established must mean consideration "only of wildlife values or refuge values," not of any broader social or economic concerns.

FEDERAL THREATENED AND ENDANGERED SPECIES

The study area, which includes Cape May County and portions of Cumberland and Atlantic Counties, harbors an unusual concentration of federally listed threatened and endangered species. The occurrence of these species

exemplifies the unique and irreplaceable habitats that exist in this southern tip of New Jersey. Due to the potential for collection or harassment, we cannot provide the exact site locations for these populations. However, we have noted the municipalities where federally designated species are found in the study area. If through further planning it is determined that project activities would occur in these areas, the Service, pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), will review the project location and inform you of specific conflicts.

The following federally listed threatened and endangered species are known to occur within the study area in the general locations, as indicated:

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>	<u>STATUS</u>	<u>LOCATION</u>
<u>Birds:</u>			
Eagle, bald	<u>Haliaeetus leucocephalus</u>	E	Entire study area- Known nesting sites: Cumberland County, Downe Township; Cape May County, Upper Township

The study area is particularly important to the success of the bald eagle in New Jersey. The bald eagle was nearly eliminated in this State in the 1970's due to reproductive problems caused by DDT in the environment. As a result of intensive efforts by the New Jersey Division of Fish, Game and Wildlife's Endangered and Nongame Species Program (in coordination with the Fish and Wildlife Service) over the past 10 years, the eagle has been reestablished and has successfully nested again. Two of the four successful nesting pairs in 1991 are located within the study area. Protection of these nesting sites is crucial, since the birds are sensitive to human disturbance, which can cause them to abandon their nest. Additionally, the Maurice River and its tributaries have been identified as valuable feeding, wintering, roosting and perching habitat for the eagle, and receives the heaviest eagle use on the coastal plain of New Jersey. Four historical nesting sites of the bald eagle occur along this waterway. The Great Cedar Swamp in Cape May County is also used as a winter roosting area and was formerly used as a nesting site. Dennis Creek in Cape May County and the Maurice River drainage in Cumberland County are the two most heavily used wintering bald eagle sites in New Jersey.

Falcon, American peregrine	<u>Falco peregrinus anatum</u>	E	Entire study area- Known nesting sites: Cumberland County, Downe and Maurice River Townships; Cape May County, Upper Township; Atlantic County, Egg Harbor Township.
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Falcon, Arctic peregrine	<u>Falco peregrinus tundrius</u>	T	Entire study area-migratory
Plover, piping	<u>Charadrius melodus</u>	T	Atlantic County, Egg Harbor Township; Cape May County, Upper, Middle and Lower Townships.
Tern, roseate	<u>Sterna dougallii dougallii</u>	E	Entire study area-migratory

Plants:

Swamp pink	<u>Helonias bullata</u>	T	Cape May County, Middle and Lower Townships; Cumberland County, Downe, Lawrence, Fairfield, and Stow Creek Townships.
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The swamp pink could occur in any forested and scrub-shrub freshwater wetland, including groundwater seeps, swamps, bogs, wet meadows, and margins of meandering small streams within the study area.

In addition to these listed species, the Service intends to publish a final rule in the Federal Register in 1991 to list Aeschynomene virginica (sensitive joint-vetch) as a threatened species and a proposed rule in 1991 to list Schwalbea americana (chaffseed) as an endangered species. These species are known to occur in the following counties.

Sensitive joint-vetch rush	<u>Aeschynomene virginica</u>	PT	Along the Manumuskin River, Cumberland County.
Chaffseed	<u>Schwalbea americana</u>	PE	Historic Population in Cape May County

The largest population of sensitive joint-vetch occurs in a freshwater tidal marsh on the Manumuskin River within the study area. This species requires relatively pristine tidal marshes. Any adverse impacts on the water quality or habitat within or along the Manumuskin River could potentially affect this species.

The candidate plant species Pine Barrens boneset (Eupatorium resinosum) and the candidate vertebrate species northern pine snake (Pituophis melanoleucas melanoleucas) are also known to occur within the study area. Candidate species are those species under consideration by the Service for possible inclusion on the List of Endangered and Threatened Wildlife and Plants. Although these species receive no substantive or procedural protection under the Endangered Species Act, the Service encourages federal agencies and other planners to consider candidate species in the project planning process. Enclosed for your information is a summary of federal candidate species in New Jersey. Additional information regarding candidate species can be obtained from The New Jersey Natural Heritage Program, which provides the most up-to-date data source for candidate species in the State, as well as maintaining information on State listed species, and may be contacted at the following address:

Mr. Thomas Breden
Natural Heritage Program
Division of Parks and Forestry
CN 404
Trenton, New Jersey 08625
(609/984-0097)

Further information on State listed species may be obtained from the following office:

Ms. JoAnn Frier-Murza
Endangered and Nongame Species Program
Division of Fish, Game and Wildlife
CN 400
Trenton, New Jersey 08625
(609/292-9101)

The Service is concerned that any proposed roadway construction or improvement in the Cape May peninsula area will adversely impact endangered and threatened species. These species cannot tolerate extensive human disturbance and development. The direct construction and maintenance impacts of an improved highway could cause significant harm to existing threatened and endangered species populations. However, the indirect effect of improving access to the area could ultimately cause more severe adverse impacts to these species than direct habitat disturbance caused by construction of the roadway.

Section 7 of the Endangered Species Act sets forth requirements of federal agencies to ensure that their actions will not jeopardize the continued existence of listed species or result in adverse modification of critical habitat. Federal actions which are considered major construction activities, or actions similar in nature which significantly affect the quality of the human environment as referred to in the National Environmental Policy Act [42 U.S.C. 4332 (2)(C)], trigger the requirement of the preparation of a biological assessment to evaluate the potential effects of an action on listed and proposed species and designated or proposed critical habitat. The

biological assessment is used to determine whether any such species or habitat are likely to be adversely affected by the action. This determination will serve to determine if formal consultation (for listed species or designated habitat) or a conference (for proposed species and habitat) will be required.

OTHER ENVIRONMENTALLY SENSITIVE PROPERTIES OR AREAS

Numerous State-owned natural areas occur within or adjacent to the study area, including: Belleplain State Forest, Cape May Point State Park, Menantico Ponds Wildlife Management Area (WMA), Union Lake WMA, Peaslee WMA, Lester G. MacNamara WMA, Heislerville WMA, Corson WMA, Dennis Creek WMA, Beaver Swamp WMA, Mamora (Coastal Wetlands) WMA, and Higbee Beach WMA. Additionally, important recreational and environmental areas are owned and managed by the New Jersey Audubon Society, Cape May County Park Commission, and The Nature Conservancy. The Cape May County Park Commission manages Cape May County Park Central and Cape May County Park South within the study area, while The Nature Conservancy owns the Manumuskin River Preserve, Eldora Nature Preserve, Bennett Bogs Preserve, and Cape May Migratory Bird Refuge. The New Jersey Audubon Society owns land in Upper Township.

Under the Atlantic Coast Joint Venture of the North American Waterfowl Management Plan of 1986, three "focus areas" have been identified within or adjacent to the study area - the Cape May Marshes, the Maurice River, and the Great Egg Harbor-Jarvis Sound Wetlands. Collectively, these three areas identify 47,300 acres of important habitat that must remain protected. The North American Waterfowl Management Plan was established to reverse the decline of wetlands and waterfowl by establishing goals for conserving wetland habitats and for restoring waterfowl populations. The loss and degradation of waterfowl habitat has been identified in the plan as the major waterfowl management problem in North America.

Under the Emergency Wetlands Resources Act (EWRA) of 1986 (P.L. 99-645), six "important, scarce, and vulnerable wetlands" have been identified by the Service within or adjacent to the study area: Cape Island/Pond Creek in Lower Township; Great Cedar Swamp in Dennis, Upper, and Middle Townships; Great Egg Harbor-Jarvis Sound in Lower, Middle, and Upper Townships; Sewell Point in Cape May; Maurice River Marshes in Commercial and Maurice River Townships, and Millville; and, the Manumuskin River Complex in Maurice River Township. The EWRA directs the Department of the Interior to identify the location and types of wetlands that should receive priority attention for acquisition by Federal and State agencies using the Land and Water Conservation Fund. The purpose of the EWRA is "to promote the conservation of migratory waterfowl and to offset the serious loss of wetlands by the acquisition of wetland and other essential habitat...[and]...to promote, in concert with other Federal and State statutes and programs, the conservation of the wetlands of the Nation in order to maintain the public benefits they provide." This can be accomplished by promoting and intensifying cooperative efforts among private interests and local, State, and federal governments for the management and conservation of wetlands and by protection of wetlands through acquisition, easements, or other interests.

The National Park Service has been studying two river systems for inclusion into the National Wild and Scenic Rivers System (P.L. 100-33): the Maurice River and its Tributaries, and the Great Egg Harbor River and its Tributaries. Within the Maurice River system, the Maurice River, Manumuskin River, Menantico River, and Muskee River are within or adjacent to the study area. Within the Great Egg Harbor system, the Tuckahoe River and Cedar Swamp Creek are within the study area.

The National Park Service is also involved in a study to prepare an inventory of the important resources along the New Jersey coast, creating a Coastal Heritage Trail (P.L. 100-515). The purpose of the study is to develop a plan that results in the identification and protection of significant natural and cultural resources, as well as provide opportunities for visitor understanding and enjoyment of those resources. Many of the natural and cultural resources being studied are in Cumberland and Cape May Counties.

The Delaware Estuary has recently received considerable attention due to its natural resources of local, national, and international significance. In 1985, Governors Kean of New Jersey and Castle of Delaware joined to recognize the pivotal importance of Delaware Bay for shorebird migration by establishing the lower 25 miles of the Delaware Bay shore in New Jersey and Delaware as "Sister Reserves." In 1986, the Delaware Bay Shorebird Reserve was certified by the Council of the Western Hemisphere Shorebird Reserve Network as a "Hemispheric Reserve." This organization encourages international cooperation in shorebird and wetland conservation by highlighting the international significance of key sites in various countries.

In 1988, the U.S. Environmental Protection Agency (US EPA) added the Delaware Estuary to the National Estuary Program. The objective of the National Estuary Program is to restore and protect nationally significant estuaries threatened by pollution, development, or overuse. With the assistance of numerous State, federal, and local agencies and private groups, the US EPA is now identifying estuary problems and designing solutions by forming multiple partnerships to manage the estuary as one large and complex ecosystem.

In an attempt to gain increased recognition for the important natural resources of the estuary, the Service included the Delaware Bay estuary in the "Region 5 Northeast Coastal and Estuary Program." The Service recently established a Field Office for this program, located at Bombay Hook National Wildlife Refuge near Dover, Delaware. This office is presently identifying important wetlands and natural resources in Delaware Bay, including land in New Jersey, that will be recognized as "wetlands of international importance."

Although there are a multitude of important natural resources in the Delaware estuary, perhaps the most widely recognized is the relationship between the spawning activities of horseshoe crabs and migratory shorebirds that utilize the Delaware Bay for feeding and resting during their northward migration. The largest population of horseshoe crabs in the world is found in Delaware Bay. The shores of Delaware Bay are also the second largest staging area for shorebirds in North America (second only to the vast Cooper River Delta in Alaska). Up to one million shorebirds utilize the Delaware estuary in April, May, and June to feed upon horseshoe crab eggs. A migrating shorebird must

consume over 9,000 eggs per day in order to gain back the body fat lost during its flight of up to 5,000 non-stop miles from wintering grounds in Central and South America. During their short stay, shorebirds must replace body-fat reserves used during migration, enabling them to continue their remaining 3,000-mile journey to breeding grounds in the Arctic.

The study area is within the Pinelands National Reserve which is governed by the New Jersey Pinelands Comprehensive Management Plan. The proposed project must demonstrate compatibility with the policies of the plan. The Maurice River has also been recognized as an adjacent area of importance for maintaining the character and integrity of the Pinelands National Reserve.

The New Jersey State Development and Redevelopment Plan tier maps for Cape May County depict much of the lands in Cape May County, within the study area, to be the most environmentally sensitive, requiring the greatest protection.

BIOLOGICAL RESOURCES OF THE CAPE MAY COUNTY AREA

The following information on Cape May County natural resources was extracted from the "Final Environmental Assessment, Proposal to Establish Cape May National Wildlife Refuge, Cape May County, New Jersey" (U.S. Fish and Wildlife Service, 1988a). Information in this and the following section provides additional detail on fish and wildlife values of the Cape May peninsula and should be given full consideration in your decision making.

As a result of continuing wildlife research, there is an ever-increasing awareness of the importance of Cape May County, not only for raptors, songbirds, shorebirds, and American woodcock (Scolopax minor), but for waterfowl, particularly black duck (Anas rubripes). New Jersey provides wintering habitat for 34 percent of the Atlantic Flyway wintering black duck population, with the Delaware Bay marshes accounting for much of this habitat. These marshes have been identified as important black duck habitat in the Service's Category Plan for Preservation of Black Duck Wintering Habitat on the Atlantic Coast (U.S. Fish and Wildlife Service, 1988b).

The Cape May peninsula has long been renowned for its spectacular concentration of birds during the spring and fall migrations. Because of its unique configuration and geographic location along the Atlantic Flyway, thousands of songbirds, raptors, and woodcock are funneled into Cape May during the fall migration. Faced with twelve miles of water to cross, migrants may linger in the area to rest and feed until more favorable winds allow them to cross the Bay or head north along the eastern shore of Delaware Bay. It is well recognized that the Delaware Bayshore upland edge is a critical migratory bird corridor in the fall. Over 360 species of birds can be observed in Cape May County during the year.

The Cape May peninsula is also important to a diversity of mammals, reptiles, amphibians, and commercial and recreationally important finfish and shellfish populations. The following is a brief description of the significant wildlife resources of the peninsula:

a. Waterfowl

As stated previously, the coastal wetlands of New Jersey, particularly the Delaware Bay marshes, are of international importance to wintering waterfowl, annually wintering 34 percent of the entire Atlantic Flyway black duck population. During severe winters black ducks rely heavily on freshwater fringe areas along the upland edges of the marsh, where the relatively constant temperature of the upper reaches of small streams and creeks remain ice-free when the remainder of the marsh is iced-over. These marshes also provide important breeding habitat for the black duck. Nesting surveys conducted by the New Jersey Division of Fish, Game and Wildlife have found very high nest densities of black ducks in the Delaware Bay Division of the Cape May National Wildlife Refuge (1 nest/20-30 acres).

In addition to black ducks, the area also supports large numbers of migrating waterfowl, many of which remain throughout the winter. Wood duck (Aix sponsa), blue-winged teal (Anas discors), green-winged teal (A. crecca), American widgeon (A. americana), mallard (A. platyrhynchos), gadwall (A. strepera), northern shoveler (A. clypeata), northern pintail (A. acuta), canvasback (Aythya valisineria), greater scaup (A. marila), lesser scaup (A. affinis), bufflehead (Bucephala albeola), Canada geese (Branta canadensis), and snow geese (Chen caerulescans) all winter and/or migrate throughout the area.

b. Federal/State Endangered and Threatened Species

As previously described, federal and State designated species within the area include the bald eagle and peregrine falcon, both listed as endangered. Fall raptor surveys conducted by the Cape May Bird Observatory at Cape May Point since 1976 have demonstrated a dramatic increase in observations of both species. Over the past ten years, peregrine sightings have undergone a five-fold increase, while bald eagle sightings have doubled.

Migrating and wintering eagles utilize the extensive marshes for hunting and the wooded swamp and "critical edge" habitats for roosting. The Dennis Creek and Maurice River are the most heavily used wintering eagle sites in New Jersey. In addition, Great Cedar Swamp and the drainage of the Maurice River are historic nesting sites for bald eagles. Although eagles now only roost in the swamp, the area is a potential nesting site for those eagles "hacked" in nearby Cumberland County when they reach maturity.

Several species that utilize the study area have also been listed by the State of New Jersey as endangered, threatened, or "species of concern." These include osprey (Pandion haliaetus), red-shouldered hawk (Buteo lineatus), northern goshawk (Accipiter gentilis), Cooper's hawk (A. cooperii), northern harrier (Circus cyaneus), short-eared owl (Asio flammeus), barred owl (Strix varia), wood duck, black duck, great blue heron (Ardea herodias), eastern tiger salamander (Ambystoma t. tigrinum), and southern gray treefrog (Hyla chrysoscelis). Excellent

potential exists for the following species to be found in the Cape May County study area as well: yellow-crowned night-heron (Nycticorax violaceus), American bittern (Botaurus lentiginosus), upland sandpiper (Bartramia longicauda), black rail (Laterallus jamaicensis), and sedge wren (Cistothorus platensis).

c. National and Regional Resource Plan Species

The Service has designated 72 fish and wildlife species or groups of species as National Resource Plan species and several others as Regional Resource Plan species. This category encompasses those fish and wildlife species of special biological, legal, or public interest upon which Service effort and attention is focused. This designation serves to identify priority management needs and to focus and coordinate Service planning efforts. The study area for the Cape May National Wildlife Refuge supports 30 of these specially designated species at some point in their life cycles. Some notable species include black duck, snow goose, American woodcock, bald eagle, and peregrine falcon.

d. Raptors

The migration of raptors through Cape May is significant with large numbers of fifteen species observed. Each year since 1976 an average of 75,000 hawks are recorded by the Cape May Bird Observatory. As these birds are hesitant to cross water, recent studies by Herpetological Associates (1991) suggest 35 percent of the species migrate north along the length of the Bay coast utilizing the Bayshore upland edge as a migratory corridor. Notable species include sharp-shinned hawk (Accipiter striatus), Cooper's hawk, red-tailed hawk (Buteo jamaicensis), broad-winged hawk (B. platypterus), red-shouldered hawk, northern harrier (Circus cyaneus), American kestrel (Falco sparverius), and merlin (F. columbarius).

Large annual flights of owls also migrate through Cape May. Typical species include the common barn owl (Tyto alba), northern saw-whet owl (Aegolius acadicus), and long-eared owl (Asio otus). The thick cedar groves and woodlands of the study area are important to wintering populations of owls, including long-eared owl, short-eared owl (A. flammeus), northern saw-whet owl, and barred owl.

e. Mammals

Common mammals of the study area include white-tailed deer (Odocoileus virginianus), gray fox (Urocyon cinereoargenteus), red fox (Vulpes vulpes), raccoon (Procyon lotor), long-tailed weasel (Mustela frenata), mink (M. vison), striped skunk (Mephitis mephitis), river otter (Lutra canadensis), muskrat (Ondatra zibethicus), southern flying squirrel (Glaucomys volans), gray squirrel (Sciurus carolinensis), red squirrel (Tamiasciurus hudsonicus), eastern chipmunk (Tamias striatus), eastern cottontail (Sylvilagus floridanus), Virginia opossum (Didelphis virginiana), and little brown bat (Myotis lucifugus). Typical small mammals include eastern mole (Scalopus aquaticus), white-footed mouse

(Peromyscus leucopus), meadow jumping mouse (Zapus hudsonius), meadow vole (Microtus pennsylvanicus), pine vole (M. pinetorum), and marsh rice rat (Oryzomys palustris).

These species utilize a variety of habitats within the Cape May National Wildlife Refuge; however, "critical edge" habitats support the largest diversity of mammals. Deer and other species use this habitat as a travel corridor while others may rely on it as their primary habitat.

f. Additional species

Additional species include mourning dove (Zenaida macroura), northern bobwhite (Colinus virginianus), wild turkey (Meleagris gallopavo), and ruffed grouse (Bonasa umbellus). Ruffed grouse nest in the Fishing Creek lowlands which represents the southernmost limit of the continental range of this species. Further south, the species is only found at higher elevations.

During the fall migration, nearly 100 species of songbirds pass through the area utilizing a variety of habitat types. An abundance of songbirds also breed in the "critical edge" habitat of the cedar swamps and salt marsh.

A variety of commercially and recreationally important finfish and shellfish populations are directly or indirectly dependent on maintaining the natural areas encompassing the Cape May National Wildlife Refuge. The coastal bays, marshes, and tidal creeks provide important nursery grounds and nutrient sources for many species, while "critical edge" habitats filter out pollutants and sediments before they reach estuarine wetlands and open bay water. Some species such as the mummichog (Fundulus heteroclitus), a common prey species for many larger fish and for wading birds, depend on estuarine salt marsh as their primary habitat, while others depend on the estuary for only a portion of their life cycle. Commercially and recreationally important finfish and shellfish species that utilize the estuary during a portion of their life cycle include weakfish (Cynoscion regalis), summer flounder (Paralichthys dentatus), bluefish (Pomatomus saltatrix), black sea bass (Centropristis striata), blue crab (Callinectes sapidus), and hard clam (Mercenaria mercenaria).

BIOLOGICAL RESOURCES OF THE MAURICE RIVER AREA

From the standpoint of fish and wildlife, the Maurice River, its tributaries and associated wetlands, represent one of the most unique and productive ecosystems in New Jersey. The Maurice River system drains over 100 square miles of land, including 21 square miles of wetlands, which buffer and filter the water before it reaches Delaware Bay. The river is fresh to below Millville, brackish until near Dorchester, and saline through the remainder of its length. The low salinity section from near Millville to Bricksboro is characterized by extensive acreage of wild rice, and in fact contains the largest wild rice marshes in the State. The lower river below Mauricetown is

extensive salt marsh. Hence, a variety of habitats are available to fish and wildlife along the Maurice River.

The river and adjacent lands provide high value habitat for fish, waterfowl, furbearers, reptiles, amphibians, raptors, shorebirds, water birds, and shellfish. As stated previously, numerous federal and/or State designated threatened and endangered fish and wildlife species inhabit the river and adjacent areas, as well as several rare plants.

Of primary concern to the Service are possible project impacts to the State and federally designated endangered bald eagle. The Maurice River is crucial to the restoration of a breeding population of bald eagles to New Jersey. To return the population to a level capable of sustaining itself, the New Jersey Division of Fish, Game and Wildlife and the Fish and Wildlife Service have been involved in an eagle restoration project. The project involved releasing fledged eaglets in the Maurice River area in order to expand the breeding population. The Maurice River and its tributaries have been identified as crucial feeding, wintering, roosting, and perching habitats for the bald eagle. Historically, the river has supported many pairs of eagles and the success of the eagle restoration project is directly dependant upon the Maurice River system.

Herpetological Associates, Inc. conducted several environmental studies on the Maurice River system. Study reports address fish, amphibian, reptile, bird, and mammal occurrence in the system. These reports are briefly discussed herein to emphasize the data they provide.

Herpetological Associates (1988a) recorded 134 species of birds on the Maurice River between October 1987 and April 1988. Twenty-five species of waterfowl were recorded and 16 species of raptors were surveyed. The raptor and waterfowl numbers recorded were highly significant, and reveal habitat use of the Maurice River system to a degree perhaps unparalleled in New Jersey. Existing data has hinted at major use of the Maurice River by wintering raptors. Up to 35 red-tailed hawks had been reported from a five mile stretch of the Maurice, as well as up to 20 northern harrier (Sutton, unpublished, 1984) present along the river. Systematic coverage of all major southern New Jersey river systems (Sutton and Sutton, 1982, 1986) has revealed up to 14 individual bald eagles present in a given winter in the Dividing Creek/Maurice River region. Studies of the Manumuskin River in 1987 indicated substantial bald eagle use of the Maurice and intimated that eagle use occurs daily (Herpetological Associates, 1987a). The Maurice River drainage and the Dennis Creek marsh in Cape May County are the most heavily used wintering eagle sites in New Jersey.

The Maurice River supports one of New Jersey's highest black duck populations. Up to 3,150 black ducks and 1,525 mallards were noted on the Manumuskin River and the adjacent Maurice River in January of 1987 (Herpetological Associates, 1987a). Petrongolo (1987) noted up to 13,000 waterfowl using the river in winter. Other records have indicated up to 110,000 snow geese present (Kane, 1979) as well as thousands of northern pintail and green-winged teal (Sutton, unpublished, 1981).

Although no systematic owl census was undertaken, Herpetological Associates (1988b) reported locating great horned owls (Bobo virginianus), eastern screech owl (Otus asio), barn owls, long-eared owls, short-eared owls, saw-whet owls, and barred owls.

The botanical significance of the Maurice River system has also been documented by Herpetological Associates (1987a). About 50 rare plants are found in the system, including the sensitive-joint vetch, a globally endangered plant; Parker's pipewort (Eriocaulon parkeri), a globally imperiled plant currently a candidate for federal listing as either endangered or threatened; the velvety-leaved tick trefoil (Desmodium viridiflora), imperiled in the State; and, the round-fruited hedge-hyssop (Gratiola virginiana), also imperiled in the State. Many of these plants are associated with the wetlands and pristine waters of the Manumuskin and Menantico Rivers.

Herpetological Associates (1987b) also documented mammal and herptile surveys of the Manumuskin River and portions of the Maurice River. Eighty species were observed, most of which were confirmed breeding on site. Several State endangered and threatened herptile species were also found, including the Pine Barrens treefrog (Hyla andersonii), southern gray treefrog, eastern tiger salamander (Ambystoma tigrinum), and northern pine snake.

Several marine fisheries surveys have been undertaken in the Maurice River and adjoining river and cove areas. Herptological Associates (1988b) reports on the status and values of 60 fish sampled in the river system, including striped bass (Morone saxatilis), American shad (Alosa sapidissima) (State threatened species), alewives (A. pseudoharengus) and blueback herring (A. aestivalis), shortnose sturgeon (Acipenser brevirostrum) (both a federal and State endangered species) and the Atlantic sturgeon (A. oxyrinchus) (State threatened). The commercial and recreational importance of blue crab (Callinectes sapidus) and oysters (Crassostrea virginica) is also described.

The Maurice River has been recognized by the New Jersey Pinelands Comprehensive Management Plan as an adjacent area of importance for maintaining the character and integrity of the Pinelands National Reserve.

CONCLUSIONS

Cape May County has, until recently, remained a relatively rural, agricultural area. Isolated in the extreme southern portion of the State, the area's economy was based on its seasonal tourist industry, fishing and shellfishing industry, and its agricultural resources. In recent years the rapid growth of the casino and resort industry in the Atlantic City area has greatly accelerated commercial and residential growth in the County. This type of growth coupled with the expansion of the tourist industry now threatens the ecological integrity of remaining fish and wildlife habitat.

Extension of Route 55 may alleviate traffic congestion, but this improvement will likely facilitate more growth and attract more tourism to the area, at the expense of Cape May's extremely valuable natural resources. For this reason, the Service is very concerned about the proposal to extend Route 55.

Project implementation would likely cause significant damage, both directly and indirectly, to valuable and sometimes irreplaceable fish and wildlife resources.

Given the importance of Cape May County's natural resources and their sensitivity to development, the Service is extremely doubtful that it could support construction of the Route 55 extension. These natural resources are still in existence due in part to the fact that they have not been adversely impacted by development. Encouraging increased development by improving the transportation system would not appear to be a wise decision, if these resources are to be maintained for future generations.

General observations reveal that the existing roadways only receive heavy use on Friday and Sunday nights during the summer months. Recent road improvements to County Route 670, as well as ongoing improvements to State Routes 49 and 47, should help alleviate traffic congestion. Road improvements may eliminate the traffic problems at the identified areas, but will only transfer congestion to destination areas in local municipalities.

In view of the foregoing, the Service recommends the DOT refrain from initiating a study to extend Route 55 to the Garden State Parkway. We believe a decision to not extend this roadway is the right decision, and will help perpetuate the continued existence and associated public use of Cape May's important natural resources.

The Service is willing to provide technical assistance and work with the DOT to address transportation problems in the Cape May area if solutions are compatible with protection of natural resources. Please contact Allen Jackson of this office if you have any questions. The Service is available to meet with the DOT to discuss this project further.

Sincerely,



Clifford G. Day
Supervisor

Enclosures

The following is an excerpt from a report entitled ECOLOGY: Methods and Existing Conditions written by the Bureau of Environmental Analysis for the New Jersey Department of Transportation. This report covered a variety of topics, including geology and groundwater resources, soils, water quality, upland vegetation, wetlands, and threatened and endangered species. Only the portion pertaining to threatened and endangered species was deemed relevant to Subsection II-B of this report.

F. Threatened and Endangered Species

1. Methods

In order to assess the potential impacts of the proposed project on federal, state and Pinelands listed endangered or threatened species, inventories of documented sightings were acquired through the NJDEP's New Jersey Natural Heritage Program (NJNHP). The Conservation Plan for the Manumuskin River Watershed, 1988; the Mammalogical and Herpetological Report for the Manumuskin and Portions of the Maurice River Systems in Cumberland County, New Jersey, 1987 and personal communication with Elizabeth Johnson, Acting Director, New Jersey Field Office, The Nature Conservancy, 1991 were also used as references for this section.

2. Existing Conditions

According to NJNHP data, there are 21 vertebrate and 61 vascular plant threatened or endangered species found in the study area. Tables 3 and 4 list each of these species, along with its habitat type. The status and date of sighting for these rare plants and animals are given in tables 5-12. These tables list all the threatened and endangered species found in each USGS Quadrangle which are located in the study area.

The exact location of each species is not available. However, the Natural Heritage Index Maps indicate general areas where endangered or threatened species occurrences are located (see figures 15-22). In addition, some of the most important sites in the state for endangered and threatened plants, animals and ecosystems have been delineated by NJNHP. Figures 16, 17, 18, 19 & 20 show the Natural Heritage Priority Sites within the study area.

One of the rarest plants in the state and the world is found within the study area. The largest and most viable population of sensitive joint vetch is located in the Manumuskin River basin (see figure 8). This population represents approximately 1/3 of the total naturally occurring global population. This rare community of sensitive joint vetch exists in the Manumuskin River because of its pristine water quality, exemplary tidal marsh and undeveloped drainage basin. The Nature Conservancy has identified the Manumuskin River as the best opportunity to protect the sensitive joint vetch in the world today. To that end the Conservancy has targeted this area as one of its highest priorities in the country. Through acquisition of fee simple interests, development rights and management agreements, the Nature Conservancy currently manages over 2,000 acres as a nature preserve for the sensitive joint vetch and 11 other plants on the Manumuskin River.

The rare northern scarlet snake which is classified as an undetermined species (under study to determine if threatened or endangered) by the NJDEP is found in the study area. The local population extends from the Port Elizabeth-Cumberland Road vicinity in a westerly direction to perhaps as far as Millville-Vineland, and is the largest and possibly the only extant population in New Jersey. This species is found in areas of sandy upland soils.

The large number of endangered and threatened species within the study area is due to the rather undeveloped nature of this area of New Jersey and the excellent quality of surface water.



NATURAL LANDS MANAGEMENT

CAUTIONS AND RESTRICTIONS ON NATURAL HERITAGE DATA

The quantity and quality of data collected by the Natural Heritage Program is dependent on the research and observations of many individuals and organizations. Not all of this information is the result of comprehensive or site-specific field surveys. Some natural areas in New Jersey have never been thoroughly surveyed. As a result, new locations for plant and animal species are continuously added to the data base. Since data acquisition is a dynamic, ongoing process, the Natural Heritage Program cannot provide a definitive statement on the presence, absence, or condition of biological elements in any part of New Jersey. Information supplied by the Natural Heritage Program summarizes existing data known to the program at the time of the request regarding the biological elements or locations in question. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. The attached data is provided as one source of information to assist others in the preservation of natural diversity.

This office cannot provide a letter of interpretation or a statement addressing the classification of wetlands as defined by the Freshwater Wetlands Act. Requests for such determination should be sent to the DEP Division of Coastal Resources, Bureau of Freshwater Wetlands, CN 402, Trenton, NJ 08625.

This cautions and restrictions notice must be included whenever information provided by the Natural Heritage Database is published.

EXPLANATION OF CODES

For Tables 3 - 12

1. FEDERAL STATUS CODES (F)

U.S. Fish and Wildlife categories of endangered and threatened plants and animals.

3C = More widespread than previously thought or is not subject to threat.

C2 = Possible listing as endangered or threatened, but not enough information to support immediate preparation of rules.

LE = Listed Endangered

E(S/A) = Endangered (similarity of appearance species)

LT = Listed threatened

CI = Enough information on file to support the appropriateness of proposing to list as endangered or threatened.

2. STATE STATUS CODES (S)

E = Endangered nongame species

T = Threatened nongame species

D = Declining nongame species

3. REGIONAL STATUS CODES (RS)

LP = Pinelands

4. NATURAL HERITAGE PRIORITY ELEMENT RANKING SYSTEM

The Nature Conservancy has developed a rarity ranking system for identifying rare species. Each species is ranked according to its rarity both in the state and globally.

Global Element Ranks

G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences) or few sites.

G2 = Imperiled globally because of rarity (6 to 20 occurrences) or few sites.

G3 = Rare and local within its range or found locally in a restricted range.

G4 = Apparently secure globally, though it may be quite rare in the parts of its range, especially at the periphery.

G5 = Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.

G? = Species has not yet been ranked.

State Element Ranks

S1 = Critically imperiled. Few remaining individuals or sites.

S2 = Imperiled in state due to habitat destruction.

S3 = Rare in state or widely distributed in the state but with small populations/acreages or with restricted distribution, but locally abundant.

S4 = Apparently secure in state.

S5 = Demonstrably secure in state.

SH = Considered possibly extant.

SU = Believed to be in peril but status uncertain.

5. HABITAT CODES

PO = Pine-oak forest
OP = Oak-pine forest
PP = Pitch pine lowlands
CS = Cedar swamp
HS = Hardwood swamp
W = Water
PE = Palustrine emergent wetland
E = Estuarine
B = Borrow pit
NF = Non-forested

TABLE 4

Vascular Plants	Habitat								
	PO	OP	PP	CS	HS	W	PE	E	NF
Barratt's Sedge								*	
Beaked Sedge						*	*		
Boltonia								*	
Boykin's Lobelia						*	*		
Black-Fruited Spikerush						*	*		
Bristling Panic Grass									*
Bur-Marigold						*	*		
Butterfly Pea									*
Clustered Bluet									*
Coast Bedstraw	*	*							
Curly Grass Fern				*					
Cut-Leaved Water Milfoil						*	*		
Dragon Mouth						*	*		
Elliptical Rushfoil									*
Featherfoil						*	*		
Floating Heart						*	*		
Fragrant Ladies'-Tresses								*	
Hairy-Stemmed Wild Yam						*	*		
Heller's Everlasting	*	*							
Longbeaked Baldrush						*			
Long's Bulrush						*	*		
Minute Duckweed						*			
New Jersey Rush				*	*	*	*		
Pale Beak Rush			*		*	*	*		
Parker's Pipewort								*	
Pine Barren Boneset				*	*	*			
Pine Barren Gentain	*	*	*						
Pine Barren Reedgrass						*	*		
Pine Barren Smoke Grass			*		*	*	*		
Pineland Tick-Trefoil	*	*							
Pink Milkwort									*
Pink Tickseed					*	*	*		
Rare Flowing Beaked Rush							*		
Reversed Bladderwort						*	*		
Richards Yellow Eyed-Grass									
Riparian Pencil Flower	*	*							
Rough Cottongrass						*	*		
Sensitive Joint-Vetch						*		*	
Short-Beaked Baldrush						*	*		
Slender Arrow Head						*	*		
Slender Plantain									*
Small-Headed Beaked Rush			*		*	*	*		
Small-Yellow Pond Lily							*	*	
Smooth Beard Tongue					*	*	*		
Smooth Tick-Trefoil	*	*							*
Southern Arrow Head						*	*		
Southern Twayblade				*	*	*	*		
Stout Smartweed			*	*	*	*			
Swamp Pink						*	*	*	

TABLE 4 (cont'd)

Vascular Plants	Habitat								
	PO	OP	PP	CS	HS	W	PE	E	NF
Tall Bush-Clover									*
Thread-leaved Beaked Rush			*		*	*	*		
Twisted Spikerush					*	*	*		
Velvety Tick-Trefoil *		*							*
Virginia False-Gromwell*		*							
Virginia Thistle			*	*	*	*	*		
Walter's St. John's Wart					*				
Whorled Nut Rush						*	*		
Whorled Water-Milfoil						*	*		
Wright's Panic Grass						*	*		
Yellow-Fringed Orchid				*	*	*	*		
Yellow-Fringless Orchid			*	*	*	*	*		

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MILLVILLE USGS QUADRANGLE
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
*** Vertebrates								
AMBYSTOMA TIGRINUM	TIGER SALAMANDER		E		G5	S2	1939-??-??	Y
CROTALUS HORRIDUS	TIMBER RATTLESNAKE		E		G5	S2	1967-SUMMR	Y
HYLA CHRYSOSCELIS	COPE'S GRAY TREEFROG		E		G5	S2	1975-??-??	Y
PITUOPHIS MELANOLEUCUS	PINE SNAKE		T		G5	S3	1980-07-26	Y
STRIX VARIA	BARRED OWL		T		G5	S3	1989-10-10	Y
*** Vascular plants								
ARETHUSA BULBOSA	DRAGON MOUTH				G4	S2	1988-05-29	Y
BIDENS BIDENTOIDES	BUR-MARIGOLD	3C			G3	S2	1979-10-06	Y
CAREX BARRATTII	BARRATT'S SEDGE	3C		LP	G3	S3	1938-05-01	Y
COREOPSIS ROSEA	PINK TICKSEED			LP	G3	S2	1935-08-13	Y
COREOPSIS ROSEA	PINK TICKSEED			LP	G3	S2	1960-09-25	Y
DESMODIUM STRICTUM	PINELAND TICK-TREFOIL			LP	G3G4	S2	1917-10-13	Y
ELEOCHARIS TORTILIS	TWISTED SPIKERUSH		E		G5	SH	1923-08-12	Y
ERIOCAULON PARKERI	PARKER'S PIPEWORT	C2			G3	S2	1909-10-07	Y
EUPATORIUM RESINOSUM	PINE BARREN BONESET	C2	E	LP	G2	S2	1985-09-18	Y
EUPATORIUM RESINOSUM	PINE BARREN BONESET	C2	E	LP	G2	S2	1946-08-25	Y
HELONIAS BULLATA	SWAMP-PINK	LT	E	LP	G2	S2	1870-05-??	Y
HELONIAS BULLATA	SWAMP-PINK	LT	E	LP	G2	S2	1891-04-23	Y
HELONIAS BULLATA	SWAMP-PINK	LT	E	LP	G2	S2	1988-05-29	Y
JUNCUS CAESARIENSIS	NEW JERSEY RUSH	C2	E	LP	G2	S2	1985-07-??	Y
ONOSMODIUM VIRGINIANUM	VIRGINIA FALSE-GROMWELL		E		G4	S1	1871-06-22	Y
PENSTEMON LAEVIGATUS	SMOOTH BEARD TONGUE				G5	S1	1934-06-17	Y
POLYGALA INCARNATA	PINK MILKWORT		E		G5	SH	1934-08-29	Y
RHYNCHOSPORA MICROCEPHALA	SMALL-HEADED BEAKED RUSH		E		G?	S1	1940-09-22	Y
SCHIZAEA PUSILLA	CURLY GRASS FERN	C2		LP	G3	S3	1875-??-??	Y
SCHIZAEA PUSILLA	CURLY GRASS FERN	C2		LP	G3	S3	1923-08-12	Y
STYLOSANTHES RIPARIA	RIPARIAN PENCIL FLOWER		E		G?	SH	1934-08-29	Y

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Table 6

PORT ELIZABETH USGS QUADRANGLE
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
*** Vertebrates								
AMBYSTOMA TIGRINUM	TIGER SALAMANDER		E		G5	S2	1975-??-??	Y
AMBYSTOMA TIGRINUM	TIGER SALAMANDER		E		G5	S2	1985-03-??	Y
ELAPHE GUTTATA	CORN SNAKE		E		G5	S1	1972-05-30	Y
ELAPHE GUTTATA	CORN SNAKE		E		G5	S1	1979-??-??	Y
HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	LE	E		G3	S1	1954-??-??	Y
HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	LE	E		G3	S1	1955-??-??	Y
HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	LE	E		G3	S1	1954-??-??	Y
Hyla ANDERSONII	PINE BARRENS TREEFROG	3C	E		G4	S3	1975-07-25	Y
Hyla ANDERSONII	PINE BARRENS TREEFROG	3C	E		G4	S3	1982-05-06	Y
Hyla CHRYSOSCELIS	COPE'S GRAY TREEFROG		E		G5	S2	1979-08-22	Y
Hyla CHRYSOSCELIS	COPE'S GRAY TREEFROG		E		G5	S2	1981-05-28	Y
Hyla CHRYSOSCELIS	COPE'S GRAY TREEFROG		E		G5	S2	1986-06-12	Y
MELANERPES ERYTHROCEPHALUS	RED-HEADED WOODPECKER		T		G5	S3	1987-05-26	
PANDION HALIAETUS	OSPREY		T		G5	S3	1987-??-??	Y
PANDION HALIAETUS	OSPREY		T		G5	S3	1987-??-??	Y
PITUOPHIS MELANOLEUCUS	PINE SNAKE		T		G5	S3	1980-07-20	Y
PITUOPHIS MELANOLEUCUS	PINE SNAKE		T		G5	S3	1979-08-??	Y
PITUOPHIS MELANOLEUCUS	PINE SNAKE		T		G5	S3	1986-09-20	Y
PITUOPHIS MELANOLEUCUS	PINE SNAKE		T		G5	S3	1978-05-??	Y
PITUOPHIS MELANOLEUCUS	PINE SNAKE		T		G5	S3	1956-SUMMR	Y
PITUOPHIS MELANOLEUCUS	PINE SNAKE		T		G5	S3	1954-SUMMR	Y
PITUOPHIS MELANOLEUCUS	PINE SNAKE		T		G5	S3	1954-04-04	Y
PITUOPHIS MELANOLEUCUS	PINE SNAKE		T		G5	S3	1982-SUMMR	
STERNA ANTILLARUM	LEAST TERN		E		G4	S2	1986-05-30	Y
STRIX VARIA	BARRED OWL		T		G5	S3	1984-SUMMR	Y
STRIX VARIA	BARRED OWL		T		G5	S3	1987-SUMMR	Y
STRIX VARIA	BARRED OWL		T		G5	S3	1987-SUMMR	Y
STRIX VARIA	BARRED OWL		T		G5	S3	1987-SUMMR	Y
STRIX VARIA	BARRED OWL		T		G5	S3	1987-SUMMR	Y
STRIX VARIA	BARRED OWL		T		G5	S3	1984-??-??	Y

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Table 6 (cont.)

PORT ELIZABETH USGS QUADRANGLE
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
*** Ecosystems								
BRACKISH TIDAL MARSH COMPLEX	BRACKISH TIDAL MARSH COMPLEX				G5	S2?	198?-??-??	?
COASTAL PLAIN INTERMITTANT POND	VERNAL POND				G3?	S2S3?	1985-08-09	Y
COASTAL PLAIN INTERMITTANT POND	VERNAL POND				G3?	S2S3?	1985-08-09	Y
COASTAL PLAIN INTERMITTANT POND	VERNAL POND				G3?	S2S3?	1985-08-09	Y
COASTAL PLAIN INTERMITTANT POND	VERNAL POND				G3?	S2S3?	1985-08-09	Y
FRESHWATER TIDAL MARSH COMPLEX	FRESHWATER TIDAL MARSH COMPLEX				G4?	S3?	1985-??-??	Y
*** Other types								
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?	1986-01-??	Y
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?	1982-01-??	Y
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?	1986-01-??	Y
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?	1987-01-??	Y
*** Vascular plants								
AESCHYNOMENE VIRGINICA	SENSITIVE JOINT-VETCH	C2	E	LP	G2	S1	1974-06-29	Y
AESCHYNOMENE VIRGINICA	SENSITIVE JOINT-VETCH	C2	E	LP	G2	S1	1984-09-09	Y
CAREX BARRATTII	BARRATT'S SEDGE	3C		LP	G3	S3	1985-05-18	Y
CAREX ROSTRATA	BEAKED SEDGE				G5	S2	1963-06-21	?
CLITORIA MARIANA	BUTTERFLY PEA		E		G5	S1	1987-08-08	Y
COREOPSIS ROSEA	PINK TICKSEED			LP	G3	S2	1934-08-15	Y
DESMODIUM STRICTUM	PINELAND TICK-TREFOIL			LP	G3G4	S2	1987-08-10	Y
DESMODIUM STRICTUM	PINELAND TICK-TREFOIL			LP	G3G4	S2	1988-10-07	Y
DESMODIUM STRICTUM	PINELAND TICK-TREFOIL			LP	G3G4	S2	1937-06-20	Y
ERIOCAULON PARKERI	PARKER'S PIPEWORT	C2			G3	S2	1937-06-20	Y
ERIOCAULON PARKERI	PARKER'S PIPEWORT	C2			G3	S2	1980-08-19	Y
ERIOCAULON PARKERI	PARKER'S PIPEWORT	C2			G3	S2	1936-11-08	Y

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PORT ELIZABETH USGS QUADRANGLE
 RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
 THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
EUPATORIUM RESINOSUM	PINE BARREN BONESET	C2	E	LP	G2	S2	1932-09-18	Y
EUPATORIUM RESINOSUM	PINE BARREN BONESET	C2	E	LP	G2	S2	1934-08-15	Y
GENTIANA AUTUMNALIS	PINE BARREN GENTIAN	3C		LP	G3	S3	1924-09-11	Y
LESPEDEZA STUEVEI	TALL BUSH-CLOVER				G4?	S2	1985-??-??	Y
MUHLENBERGIA TORREYANA	PINE BARREN SMOKE GRASS	C1		LP	G3	S3	1985-08-09	Y
MUHLENBERGIA TORREYANA	PINE BARREN SMOKE GRASS	C1		LP	G3	S3	1985-08-09	Y
NUPHAR MICROPHYLLUM	SMALL YELLOW POND LILY		E		G5	SH	1932-09-18	Y
PANICUM WRIGHTIANUM	WRIGHT'S PANIC GRASS				G4	S2	1985-08-09	Y
PANICUM WRIGHTIANUM	WRIGHT'S PANIC GRASS				G4	S2	1985-08-09	Y

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HEISLERVILLE USGS QUADRANGLE
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
*** Vertebrates								
AMBYSTOMA TIGRINUM	TIGER SALAMANDER		E		G5	S2	1974-??-??	Y
AMBYSTOMA TIGRINUM	TIGER SALAMANDER		E		G5	S2	1986-06-05	Y
AMBYSTOMA TIGRINUM	TIGER SALAMANDER		E		G5	S2	1970-??-??	Y
AMMODRAMUS HENSLOWII	HENSLOW'S SPARROW		E		G4	S1	1970-??-??	Y
CIRCUS CYANEUS	NORTHERN HARRIER		E		G5	S2	1986-07-??	Y
CIRCUS CYANEUS	NORTHERN HARRIER		E		G5	S2	1979-07-??	Y
FALCO PEREGRINUS	PEREGRINE FALCON	E/SA	E		G3	S1	1986-SUMMR	Y
HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	LE	E		G3	S1	1990-06-07	Y
HYLA ANDERSONII	PINE BARRENS TREEFROG	3C	E		G4	S3	????-??-??	Y
HYLA ANDERSONII	PINE BARRENS TREEFROG	3C	E		G4	S3	1979-??-??	Y
HYLA CHRYSOSCELIS	COPE'S GRAY TREEFROG		E		G5	S2	????-??-??	Y
HYLA CHRYSOSCELIS	COPE'S GRAY TREEFROG		E		G5	S2	1975-??-??	Y
HYLA CHRYSOSCELIS	COPE'S GRAY TREEFROG		E		G5	S2	1979-05-03	Y
PITUOPHIS MELANOLEUCUS	PINE SNAKE		T		G5	S3	1977-06-??	Y
STRIX VARIA	BARRED OWL		T		G5	S3	1987-SUMMR	Y
*** Other types								
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?	1985-01-??	Y
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?	1985-01-??	Y
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?	1984-01-??	Y
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?	1984-01-??	Y
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?	1985-01-??	Y
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?	1980-01-??	Y
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?	1982-01-??	Y
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?	1980-01-??	Y
MIGRATORY SHOREBIRD	MIGRATORY SHOREBIRD				G?	S?	1988-??-??	Y
CONCENTRATION SITE	CONCENTRATION SITE							
MIGRATORY SHOREBIRD	MIGRATORY SHOREBIRD				G?	S?	1988-??-??	Y
CONCENTRATION SITE	CONCENTRATION SITE							
MIGRATORY SHOREBIRD	MIGRATORY SHOREBIRD				G?	S?	1988-??-??	Y

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WOODBINE USGS QUADRANGLE
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL GRANK STATUS	SRANK	DATE OBSERVED	IDENT.
*** Vertebrates							
AMBYSTOMA TIGRINUM	TIGER SALAMANDER		E		G5	S2	1990-02-22 Y
AMMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		T/D		G4	S2	1989-05-?? Y
BARTRAMIA LONGICAUDA	UPLAND SANDPIPER		E		G5	S1	1977-??-?? Y
BUTEO LINEATUS	RED-SHOULDERED HAWK		T		G5	S2	1989-06-21 Y
BUTEO LINEATUS	RED-SHOULDERED HAWK		T		G5	S2	1989-06-?? Y
CIRCUS CYANEUS	NORTHERN HARRIER		E		G5	S2	1986-07-?? Y
CROTALUS HORRIDUS	TIMBER RATTLESNAKE		E		G5	S2	1900-??-?? Y
HYLA ANDERSONII	PINE BARRENS TREEFROG	3C	E		G4	S3	1980-05-24 Y
HYLA ANDERSONII	PINE BARRENS TREEFROG	3C	E		G4	S3	1975-06-23 Y
HYLA ANDERSONII	PINE BARRENS TREEFROG	3C	E		G4	S3	1974-06-23 Y
HYLA ANDERSONII	PINE BARRENS TREEFROG	3C	E		G4	S3	1988-06-20 Y
HYLA ANDERSONII	PINE BARRENS TREEFROG	3C	E		G4	S3	1989-05-19 Y
HYLA CHRYSOSCELIS	COPE'S GRAY TREEFROG		E		G5	S2	1974-??-?? Y
HYLA CHRYSOSCELIS	COPE'S GRAY TREEFROG		E		G5	S2	1975-06-23 Y
HYLA CHRYSOSCELIS	COPE'S GRAY TREEFROG		E		G5	S2	1978-06-24 Y
HYLA CHRYSOSCELIS	COPE'S GRAY TREEFROG		E		G5	S2	1975-??-?? Y
PITUOPHIS MELANOLEUCUS	PINE SNAKE		T		G5	S3	????-??-?? Y
STRIX VARIA	BARRED OWL		T		G5	S3	1987-SUMMR Y
STRIX VARIA	BARRED OWL		T		G5	S3	1987-SUMMR Y
STRIX VARIA	BARRED OWL		T		G5	S3	1984-??-?? Y
STRIX VARIA	BARRED OWL		T		G5	S3	1989-02-08 Y
*** Ecosystems							
COASTAL PLAIN INTERMITTANT POND	VERNAL POND				G3?	S2S3?	1985-08-09 Y
*** Other types							
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?	1985-01-?? Y
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?	1980-01-?? Y
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?	1985-01-?? Y

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WOODBINE USGS QUADRANGLE
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?	1984-01-??	Y
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?	1984-01-??	Y
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?	1986-01-??	Y
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?	1986-01-??	Y
*** Vascular plants								
CALAMOVILFA BREVIPILIS	PINE BARREN REEDGRASS	3C		LP	G3	S3	1936-07-22	Y
CLITORIA MARIANA	BUTTERFLY PEA		E		G5	S1	1925-08-16	Y
DESMODIUM STRICTUM	PINELAND TICK-TREFOIL			LP	G3G4	S2	1919-08-19	Y
ELEOCHARIS TORTILIS	TWISTED SPIKERUSH		E		G5	SH	19??-??-??	Y
EUPATORIUM RESINOSUM	PINE BARREN BONESET	C2	E	LP	G2	S2	1920-09-25	Y
GALIUM HISPIDULUM	COAST BEDSTRAW		E		G5	S1	1930-09-20	Y
GENTIANA AUTUMNALIS	PINE BARREN GENTIAN	3C		LP	G3	S3	1983-??-??	Y
GENTIANA AUTUMNALIS	PINE BARREN GENTIAN	3C		LP	G3	S3	1924-09-24	Y
GENTIANA AUTUMNALIS	PINE BARREN GENTIAN	3C		LP	G3	S3	1934-09-18	Y
HELONIAS BULLATA	SWAMP-PINK	LT	E	LP	G2	S2	1985-04-24	Y
HELONIAS BULLATA	SWAMP-PINK	LT	E	LP	G2	S2	1990-06-01	Y
HOTTONIA INFLATA	FEATHERFOIL		E		G3G4	S1	1945-06-05	Y
HOTTONIA INFLATA	FEATHERFOIL		E		G3G4	S1	1983-07-??	Y
LISTERA AUSTRALIS	SOUTHERN TWAYBLADE			LP	G4	S2	1950-05-15	Y
LISTERA AUSTRALIS	SOUTHERN TWAYBLADE			LP	G4	S2	1958-05-18	Y
LOBELIA BOYKINII	BOYKIN'S LOBELIA	C2	E	LP	G2	S1	1962-07-29	Y
LOBELIA BOYKINII	BOYKIN'S LOBELIA	C2	E	LP	G2	S1	1916-08-05	Y
MUHLENBERGIA TORREYANA	PINE BARREN SMOKE GRASS	C1		LP	G3	S3	1985-08-09	Y
NUPHAR MICROPHYLLUM	SMALL YELLOW POND LILY		E		G5	SH	1907-07-07	Y
PANICUM ACICULARE	BRISTLING PANIC GRASS	C2	E		G4G5	SH	1916-06-04	Y
PLANTAGO PUSILLA	SLENDER PLANTAIN		E		G5	SH	1916-06-04	Y
PLATANThERA INTEGRA	YELLOW FRINGELESS ORCHID	3C	E	LP	G3G4	S1	1932-08-20	Y
POLYGONUM DENSIFLORUM	STOUT SMARTWEED		E		G?	S1	1940-08-06	Y
RHYNCHOSPORA FILIFOLIA	THREAD-LEAVED BEAKED RUSH		E		G5	S1	1924-09-20	Y
RHYNCHOSPORA PALLIDA	PALE BEAK RUSH				G3?	S3	1934-09-22	Y
RHYNCHOSPORA PALLIDA	PALE BEAK RUSH				G3?	S3	1934-07-23	Y

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Table 2

WOODBINE USGS QUADRANGLE
 RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
 THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
RHYNCHOSPORA PALLIDA	PALE BEAK RUSH				G3?	S3	1936-08-06	Y
RHYNCHOSPORA RARIFLORA	RARE-FLOWERING BEAKED RUSH		E		G5	S1	1924-08-17	Y
SAGITTARIA AUSTRALIS	SOUTHERN ARROW HEAD		E		G5	S1	1940-07-23	Y
SAGITTARIA TERES	SLENDER ARROW HEAD		E		G3	S1	1921-09-10	Y
SCIRPUS LONGII	LONG'S BULRUSH	C2	E	LP	G2	S2	1919-07-01	Y
SPIRANTHES ODORATA	FRAGRANT LADIES'-TRESSES				G5	S2	1936-09-21	Y
TRIADENUM WALTERI	WALTER'S ST. JOHN'S-WORT		E		G5	S1	1987-08-07	Y
UTRICULARIA RESUPINATA	REVERSED BLADDERWORT		E	LP	G4	S1	1925-07-03	Y
XYRIS JUPICAI	RICHARDS YELLOW EYED-GRASS				G5	SU	1940-08-24	Y

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SEA ISLE CITY USGS QUADRANGLE
 RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
 THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
STERNA ANTILLARUM	LEAST TERN		E		G4	S2	1986-SUMMR	Y
STERNA ANTILLARUM	LEAST TERN		E		G4	S2	1981-??-??	Y
STERNA ANTILLARUM	LEAST TERN		E		G4	S2	1986-SUMMR	Y
STERNA ANTILLARUM	LEAST TERN		E		G4	S2	1979-??-??	Y
STERNA ANTILLARUM	LEAST TERN		E		G4	S2	1979-??-??	Y
STERNA FORSTERI	FORSTER'S TERN		IN		G5	S3	1985-06-??	Y
STERNA FORSTERI	FORSTER'S TERN		IN		G5	S3	1985-06-??	Y
STERNA FORSTERI	FORSTER'S TERN		IN		G5	S3	1985-06-??	Y
STERNA FORSTERI	FORSTER'S TERN		IN		G5	S3	1985-06-??	Y
STERNA FORSTERI	FORSTER'S TERN		IN		G5	S3	1985-06-??	Y
STERNA FORSTERI	FORSTER'S TERN		IN		G5	S3	1983-06-??	Y
STERNA HIRUNDO	COMMON TERN		D		G5	S3	1985-06-??	Y
STERNA HIRUNDO	COMMON TERN		D		G5	S3	1985-06-??	Y
STERNA HIRUNDO	COMMON TERN		D		G5	S3	1985-06-??	Y
STERNA HIRUNDO	COMMON TERN		D		G5	S3	1985-06-??	Y
STERNA HIRUNDO	COMMON TERN		D		G5	S3	1983-06-??	Y
STERNA HIRUNDO	COMMON TERN		D		G5	S3	1983-06-??	Y
STERNA HIRUNDO	COMMON TERN		D		G5	S3	1985-06-??	Y
STERNA HIRUNDO	COMMON TERN		D		G5	S3	1979-??-??	Y
STERNA HIRUNDO	COMMON TERN		D		G5	S3	1979-??-??	Y
STERNA HIRUNDO	COMMON TERN		D		G5	S3	1979-??-??	Y
STRIX VARIA	BARRED OWL		T		G5	S3	1987-SUMMR	Y
*** Other types								
COASTAL HERON ROOKERY	COASTAL HERON ROOKERY				GU	S3	1985-06-??	Y
COASTAL HERON ROOKERY	COASTAL HERON ROOKERY				GU	S3	1985-06-??	Y
COASTAL HERON ROOKERY	COASTAL HERON ROOKERY				GU	S3	1983-06-??	Y
COASTAL HERON ROOKERY	COASTAL HERON ROOKERY				GU	S3	1983-06-??	Y
*** Vascular plants								
AMARANTHUS PUMILUS	SEA-BEACH PIGWEED	C2			G2	SH	1882-08-18	Y
AMARANTHUS PUMILUS	SEA-BEACH PIGWEED	C2			G2	SH	1876-08-??	Y

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Tab 5 (cont.)

SEA ISLE CITY USGS QUADRANGLE
 RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
 THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
ELEOCHARIS MELANOCARPA	BLACK-FRUITED SPIKERUSH		E		G4	S1	1921-09-29	Y
HELONIAS BULLATA	SWAMP-PINK	LT	E	LP	G2	S2	1990-06-01	Y
HELONIAS BULLATA	SWAMP-PINK	LT	E	LP	G2	S2	1990-03-27	Y
LEMNA PERPUSILLA	MINUTE DUCKWEED				G5	SU	1937-09-01	Y
POLYGONUM DENSIFLORUM	STOUT SMARTWEED		E		G?	S1	1919-10-11	Y
POLYGONUM GLAUCUM	SEA-BEACH KNOTWEED		E		G3	S1	1912-07-25	Y
RHYNCHOSPORA GLOMERATA	CLUSTERED BEAKED RUSH		E		G5	SH	1915-10-25	Y
SCLERIA VERTICILLATA	WHORLED NUT RUSH		E		G4?	S1	1915-10-25	Y
SCLERIA VERTICILLATA	WHORLED NUT RUSH		E		G4?	S1	1916-10-07	Y
UTRICULARIA RESUPINATA	REVERSED BLADDERWORT		E	LP	G4	S1	1921-09-29	Y

68 Records Processed

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FIVE POINTS USGS QUADRANGLE
 RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
 THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
*** Vertebrates								
AMBYSTOMA TIGRINUM	TIGER SALAMANDER		E		G5	S2	1970-??-??	Y
HYLA ANDERSONII	PINE BARRENS TREEFROG	3C	E		G4	S3	1981-06-04	Y
HYLA ANDERSONII	PINE BARRENS TREEFROG	3C	E		G4	S3	1975-??-??	Y
HYLA ANDERSONII	PINE BARRENS TREEFROG	3C	E		G4	S3	1974-??-??	Y
HYLA CHRYSOSCELIS	COPE'S GRAY TREEFROG		E		G5	S2	1975-??-??	Y
HYLA CHRYSOSCELIS	COPE'S GRAY TREEFROG		E		G5	S2	1975-??-??	Y
HYLA CHRYSOSCELIS	COPE'S GRAY TREEFROG		E		G5	S2	????-??-??	Y
PITUOPHIS MELANOLEUCUS	PINE SNAKE		T		G5	S3	1957-06-02	
PITUOPHIS MELANOLEUCUS	PINE SNAKE		T		G5	S3	1954-04-04	Y
STRIX VARIA	BARRED OWL		T		G5	S3	1987-SUMMR	Y
STRIX VARIA	BARRED OWL		T		G5	S3	1987-SUMMR	Y
*** Vascular plants								
BOLTONIA ASTEROIDES VAR GLASTIFOLIA	BOLTONIA		E		G5T?	S1	1935-09-15	?
CAREX BARRATTII	BARRATT'S SEDGE	3C		LP	G3	S3	1985-06-14	Y
CAREX BARRATTII	BARRATT'S SEDGE	3C		LP	G3	S3	1985-06-14	Y
COREOPSIS ROSEA	PINK TICKSEED			LP	G3	S2	1932-10-02	Y
COREOPSIS ROSEA	PINK TICKSEED			LP	G3	S2	1935-07-25	Y
COREOPSIS ROSEA	PINK TICKSEED			LP	G3	S2	1938-09-25	Y
COREOPSIS ROSEA	PINK TICKSEED			LP	G3	S2	1987-08-08	Y
DESMODIUM LAEVIGATUM	SMOOTH TICK-TREFOIL				G5	S2	1987-06-08	Y
DESMODIUM VIRIDIFLORUM	VELVETY TICK-TREFOIL				G5?	S2	1987-08-10	Y
ERIOPHORUM TENELLUM	ROUGH COTONGRASS		E		G5	S1	1936-05-31	Y
EUPATORIUM RESINOSUM	PINE BARREN BONESET	C2	E	LP	G2	S2	1935-07-23	Y
EUPATORIUM RESINOSUM	PINE BARREN BONESET	C2	E	LP	G2	S2	1935-08-01	Y
EUPATORIUM RESINOSUM	PINE BARREN BONESET	C2	E	LP	G2	S2	1987-08-08	Y
MUHLENBERGIA TORREYANA	PINE BARREN SMOKE GRASS	C1		LP	G3	S3	1932-10-02	Y
MUHLENBERGIA TORREYANA	PINE BARREN SMOKE GRASS	C1		LP	G3	S3	1962-10-14	Y
MURIOPHYLLUM VERTICILLATUM	WHORLED WATER-MILFOIL		E		G5	SH	1935-10-06	Y

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FIVE POINTS USGS QUADRANGLE
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
PLATANThERA CILIARIS	YELLOW-FRINGED ORCHID			LP	G5	S2	1987-08-08	Y
PSILOcARYA NITENS	SHORT-BEAKED BALDRUSH				G3	S2	1962-09-30	Y
PSILOcARYA SCIRPOIDES	LONGBEAKED BALDRUSH				G4	S2	1977-09-27	Y
RHYNChOSPORA PALLIDA	PALE BEAK RUSH				G3?	S3	1935-07-23	Y
SCHIZAEA PUSILLA	CURLY GRASS FERN	C2		LP	G3	S3	1933-03-05	Y
STYLOSANTHES RIPARIA	RIPARIAN PENCIL FLOWER		E		G?	SH	1932-10-02	Y

33 Records Processed

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TUCKAHOE USGS QUADRANGLE
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
*** Vertebrates								
HYLA CHRYSOSCELIS	COPE'S GRAY TREEFROG		E		G5	S2	1975-??-??	Y
MELANERPES ERYTHROCEPHALUS	RED-HEADED WOODPECKER		T		G5	S3	1980-06-14	
MELANERPES ERYTHROCEPHALUS	RED-HEADED WOODPECKER		T		G5	S3	1989-05-??	Y
PITUOPHIS MELANOLEUCUS	PINE SNAKE		T		G5	S3	1978-07-??	Y
PITUOPHIS MELANOLEUCUS	PINE SNAKE		T		G5	S3	1981-07-03	Y
PITUOPHIS MELANOLEUCUS	PINE SNAKE		T		G5	S3	19??-??-??	Y
STRIX VARIA	BARRED OWL		T		G5	S3	1987-SUMMR	Y
STRIX VARIA	BARRED OWL		T		G5	S3	1987-SUMMR	Y
SYNAPTOMYS COOPERI	SOUTHERN BOG LEMMING		U		G5	S2	1982-??-??	Y
SYNAPTOMYS COOPERI	SOUTHERN BOG LEMMING		U		G5	S2	1982-??-??	Y
SYNAPTOMYS COOPERI	SOUTHERN BOG LEMMING		U		G5	S2	1897-04-06	Y
*** Ecosystems								
COASTAL PLAIN INTERMITTANT POND	VERNAL POND				G3?	S2S3?	1985-08-09	Y
FRESHWATER TIDAL MARSH COMPLEX	FRESHWATER TIDAL MARSH COMPLEX				G4?	S3?	1972-10-04	
*** Invertebrates								
CATOCALA PRETIOSA	THE PRECIOUS UNDERWING	C2			G1G2	S1S2	1987-05-19	Y
CATOCALA PRETIOSA	THE PRECIOUS UNDERWING	C2			G1G2	S1S2	1987-05-22	Y
*** Vascular plants								
CAREX BARRATTII	BARRATT'S SEDGE	3C		LP	G3	S3	1985-05-18	Y
CIRSIVM VIRGINIANUM	VIRGINIA THISTLE		E		G3G4	S1	1936-09-05	Y
CLITORIA MARIANA	BUTTERFLY PEA		E		G5	S1	1935-08-13	Y
CROTONOPSIS ELLIPTICA	ELLIPTICAL RUSHFOIL			LP	G5	S2	1989-07-02	Y
DESMODIUM STRICTUM	PINELAND TICK-TREFOIL			LP	G3G4	S2	1937-08-08	Y
ERIOCAULON PARKERI	PARKER'S PIPEWORT	C2			G3	S2	1972-10-04	Y
ERIOCAULON PARKERI	PARKER'S PIPEWORT	C2			G3	S2	1972-10-04	Y
ERIOCAULON PARKERI	PARKER'S PIPEWORT	C2			G3	S2	1972-10-04	Y

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TUCKAHOE USGS QUADRANGLE
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
ERIOCAULON PARKERI	PARKER'S PIPEWORT	C2			G3	S2	1972-10-04	Y
EUPATORIUM RESINOSUM	PINE BARREN BONESET	C2	E	LP	G2	S2	1984-08-20	Y
EUPATORIUM RESINOSUM	PINE BARREN BONESET	C2	E	LP	G2	S2	1984-08-19	Y
JUNCUS CAESARIENSIS	NEW JERSEY RUSH	C2	E	LP	G2	S2	1906-07-19	Y
NYMPHOIDES CORDATA	FLOATING HEART			LP	G5	S3	1985-08-09	Y
PSILOCARYA NITENS	SHORT-BEAKED BALDRUSH				G3	S2	1985-08-09	Y
RHYNCHOSPORA FILIFOLIA	THREAD-LEAVED BEAKED RUSH		E		G5	S1	1960-09-04	Y
RHYNCHOSPORA PALLIDA	PALE BEAK RUSH				G3?	S3	1935-08-13	Y
SAGITTARIA TERES	SLENDER ARROW HEAD		E		G3	S1	1984-08-19	Y
STYLOSANTHES RIPARIA	RIPARIAN PENCIL FLOWER		E		G?	SH	1901-08-25	Y

33 Records Processed

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MARMORA USGS QUADRANGLE
 RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
 THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
*** Vertebrates								
ACCIPITER COOPERII	COOPER'S HAWK		E		G4	S2	1989-06-22	Y
AMBYSTOMA TIGRINUM	TIGER SALAMANDER		E		G5	S2	1907-??-??	Y
CIRCUS CYANEUS	NORTHERN HARRIER		E		G5	S2	1986-07-15	Y
CLEMMYS MUHLENBERGII	BOG TURTLE	C2	E		G4	S2	1975-10-08	Y
CLEMMYS MUHLENBERGII	BOG TURTLE	C2	E		G4	S2	????-??-??	Y
CLEMMYS MUHLENBERGII	BOG TURTLE	C2	E		G4	S2	1985-??-??	Y
FALCO PEREGRINUS	PEREGRINE FALCON	E/SA	E		G3	S1	1986-SUMMR	Y
HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	LE	E		G3	S1	1963-??-??	Y
HYLA ANDERSONII	PINE BARRENS TREEFROG	3C	E		G4	S3	1989-06-03	Y
HYLA CHRYSOSCELIS	COPE'S GRAY TREEFROG		E		G5	S2	1980-06-07	Y
PANDION HALIAETUS	OSPREY		T		G5	S3	1987-??-??	Y
PANDION HALIAETUS	OSPREY		T		G5	S3	1987-??-??	Y
PANDION HALIAETUS	OSPREY		T		G5	S3	1987-??-??	Y
PANDION HALIAETUS	OSPREY		T		G5	S3	1987-??-??	Y
PANDION HALIAETUS	OSPREY		T		G5	S3	1987-??-??	Y
PANDION HALIAETUS	OSPREY		T		G5	S3	1987-??-??	Y
PANDION HALIAETUS	OSPREY		T		G5	S3	1987-??-??	Y
PANDION HALIAETUS	OSPREY		T		G5	S3	1987-??-??	Y
PANDION HALIAETUS	OSPREY		T		G5	S3	1987-??-??	Y
PANDION HALIAETUS	OSPREY		T		G5	S3	1987-??-??	Y
PANDION HALIAETUS	OSPREY		T		G5	S3	1987-??-??	Y
PANDION HALIAETUS	OSPREY		T		G5	S3	1987-??-??	Y
PANDION HALIAETUS	OSPREY		T		G5	S3	1987-??-??	Y
PANDION HALIAETUS	OSPREY		T		G5	S3	1987-??-??	Y
PANDION HALIAETUS	OSPREY		T		G5	S3	1989-SUMMER	Y
STRIX VARIA	BARRED OWL		T		G5	S3	1987-SUMMR	Y
STRIX VARIA	BARRED OWL		T		G5	S3	1984-??-??	Y
STRIX VARIA	BARRED OWL		T		G5	S3	198?-??-??	Y
STRIX VARIA	BARRED OWL		T		G5	S3	1989-06-??	Y
*** Invertebrates								
CATOCALA PRETIOSA	THE PRECIOUS UNDERWING	C2			G1G2	S1S2	1987-05-21	Y

23 JAN 1991

MARMORA USGS QUADRANGLE
 RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
 THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
*** Other types								
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?	1986-01-??	Y
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?	1983-01-??	Y
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?	1985-01-??	Y
*** Vascular plants								
EUPATORIUM RESINOSUM	PINE BARREN BONESET	C2	E	LP	G2	S2	1921-10-13	Y
GNAPHALIUM HELLERI	HELLER'S EVERLASTING				G4G5	SH	1921-10-13	Y
HEDYOTIS UNIFLORA	CLUSTERED BLUET				G5	S3	1988-08-25	Y
HELONIAS BULLATA	SWAMP-PINK	LT	E	LP	G2	S2	1980-04-??	Y
LISTERA AUSTRALIS	SOUTHERN TWAYBLADE			LP	G4	S2	1985-05-04	Y
RHYNCHOSPORA MICROCEPHALA	SMALL-HEADED BEAKED RUSH		E		G?	S1	1988-08-25	Y
SCHIZAEA PUSILLA	CURLY GRASS FERN	C2		LP	G3	S3	1955-10-16	Y
SCLERIA VERTICILLATA	WHORLED NUT RUSH		E		G4?	S1	1916-10-07	
SCLERIA VERTICILLATA	WHORLED NUT RUSH		E		G4?	S1	1907-09-14	Y
SPIRANTHES ODORATA	FRAGRANT LADIES'-TRESSES				G5	S2	1889-09-??	Y

40 Records Processed

SUBSECTION II-C

Socioeconomic, Land Use, and Visual Constraints

**ROUTE 55 FREEWAY EXTENSION
ATLANTIC, CUMBERLAND, CAPE MAY
COUNTIES**

**SOCIOECONOMIC, LAND USE & VISUAL
ENVIRONMENTAL CONSTRAINT ANALYSIS**

**PREPARED BY
SOCIOECONOMIC TECHNICAL GROUP
NJDOT BUREAU OF ENVIRONMENTAL ANALYSIS
MAY 1991**

ROUTE 55 FREEWAY EXTENSION
Atlantic, Cape May, and Cumberland Counties

Socioeconomic/Land Use/Visual
Environmental Constraints

INTRODUCTION

This analysis has been prepared to identify key land use and visual constraints that could influence the selection of an alternative for the possible extension of the Route 55 Freeway. Environmental constraints associated with land use and visual issues have been denoted on USGS Quadrangle maps of the study area and give a graphical portrayal of the results of this analysis. This report summarizes the methodology and findings of this effort.

A defined study corridor beginning at the southern terminus of existing Route 55 at Route 47 in Cumberland County, to the vicinity of the Garden State Parkway in Cape May County serves as the basis for this analysis (see Figure 1). Also included in the study area are the existing Routes 47/670/83 and Routes 49/50 corridors.

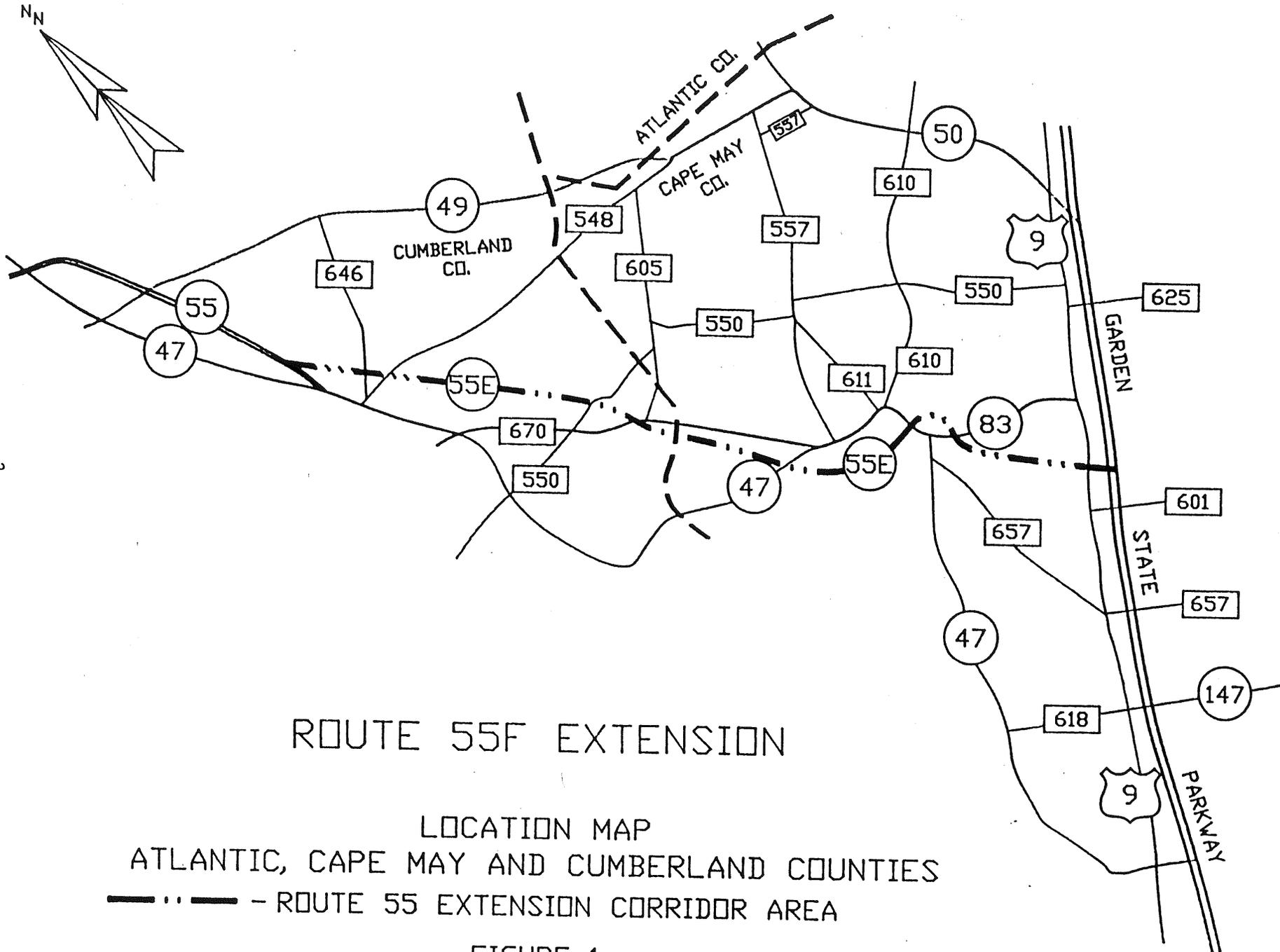
In recognition of the study area's environmental sensitivity, key land use issues related to regional environmental land use policies including NJ Pinelands and CAFRA are the primary focus of this analysis. Table 1 lists the municipalities within the study corridor, and which environmental land use policies apply to each municipality.

Development patterns are mixed throughout the extensive study area, and even though impacts to residences, cohesive communities, community facilities, etc. would occur, this type of assessment has not been undertaken. The importance of the policy issues associated with providing increased traffic capacity, possibly a new alignment, outweigh the specific details of the normal socioeconomic analysis at this point. Once an option is considered viable, and is pursued as a possible alternative, specific socioeconomic impacts would then be assessed.

This report briefly summarizes the importance of what is graphically portrayed on the US Quad Sheets. Specific policy issues related to the NJ Pinelands, the CAFRA Zone, and County Agricultural Development Areas (ADA's) are presented noting what consequences would occur if a project would affect these various "areas" or "zones".

METHODOLOGY

Utilizing US Quad Sheets with the study area highlighted, it was determined what regional environmental planning policies were applicable to the study area. This resulted in the identification of the NJ Pinelands the National Pineland Reserve, and the Coastal Area Facility Review (CAFRA) Zone all intermingled throughout the study area. Further research of the appropriate documents for these environmental land use policies was then undertaken to determine what specific "zones" or "areas" were affected and what issues would be involved.



ROUTE 55F EXTENSION

LOCATION MAP

ATLANTIC, CAPE MAY AND CUMBERLAND COUNTIES

--- - ROUTE 55 EXTENSION CORRIDOR AREA

FIGURE 1

**ROUTE 55 FREEWAY EXTENSION
ENVIRONMENTAL LAND USE POLICIES BY MUNICIPALITY**

TABLE 1

COUNTY	PINELANDS NAT. RESERVE/ CAFRA OVERLAP			
STUDY AREA MUNICIPALITIES	NJ PINELANDS	CAFRA	CAFRA	ADA'S
CUMBERLAND COUNTY				
MILLVILLE CITY				
MAURICE RIVER TOWNSHIP	*	*	*	
ATLANTIC COUNTY				
ESTELL MANOR CITY	*			
CORBIN CITY		*	*	
CAPE MAY COUNTY				
WOODBINE CITY	*	*	*	1
UPPER TOWNSHIP	*	*	*	5
DENNIS TOWNSHIP	*	*	*	10@
MIDDLE TOWNSHIP		*	*	2

@THREE FARMS ENROLLED IN THE 8 YEAR FARMLAND PRESERVATION PROGRAM ARE IN THIS MUNICIPALITY.

In addition, letters were submitted to Atlantic, Cape May and Cumberland County planning offices for assistance in identifying key land use issues that should be considered in this analysis. Responses received for each county have been incorporated in this report.

Finally, County Agricultural Development Area maps were consulted to identify any ADA's within the study area. A listing of farmsteads included in the Eight Year Farmland Preservation Program, provided by the State Agricultural Board was also reviewed to determine if any of these farmsteads were within the study corridor.

In addition to this narrative, and the USGS Quad Sheet maps, a set of matrices which summarize land use constraints by Quad Sheet has been prepared. Each matrix lists the affected land use categories within the study area and indicates which are crossed by the various corridors under study (ie. Route 55, Routes 47/670/83, and Routes 40/50).

FINDINGS

As noted, three environmental land use policies apply to the subject study area; NJ Pinelands, National Pinelands Reserve, and CAFRA. In addition, county Agricultural Development Areas are also present. The importance of the policies associated with each of these regulations are discussed below.

NJ PINELANDS

Four "areas" designated by the NJ Pinelands Comprehensive Management Plan are within the study area: "Forest Area", "Rural Development Area", "Pinelands Village" and "wild and scenic corridors". Where as specific land use policies related to these "areas" do not prohibit construction of transportation improvements, they do encourage minimal disruption of the environment, and call for transportation improvements to be designed to "primarily serve the needs of the Pinelands".

Additionally, in recognition of potential secondary development impacts, the Comprehensive Management Plan notes that, "transportation projects which would generate growth within the areas of the Pinelands slated for low densities should be discouraged". Both the Forest and Rural Development Areas are low density areas. Therefore, a new freeway, with a high probability of encouraging development, would therefore be inconsistent with the Pinelands general policy concerning transportation, particularly in the Forest and Rural Development Areas which dominate the study area.

Considering visual constraints, the NJ Pinelands has specific policies regarding "scenic corridors", which include "except for

those roads which provide for internal circulation within residentially developed areas, all public, paved roads in the Preservation Area District, the Rural Development and Forest Areas". No design requirements for these "scenic corridors" are specified, only policies relating to setbacks of any development adjacent to these roadways. However, disruption of these "scenic corridors" may be considered inconsistent with the Pinelands policies.

Finally, related to "scenic corridors", the Pinelands policies also designate specific rivers as "wild and scenic rivers and corridors of special significance to the Pinelands. All structures within 1,000 feet of the center line of these rivers shall be designed to avoid visual impacts as viewed from the river". The following rivers in the study area are included in this category:

Tuckahoe River - Great Egg Bay to Route
552 Crossing in Milmay.

Dennis Creek - Confluence with the Delaware
Bay to the headwaters of the
mainstream in the Great Cedar
Swamp west of Route 9.

Maurice River - Delaware Bay to Manumuskin River.

Manumuskin River - Confluence with the Maurice River
to the Route 49 crossing near
Cumberland Road.

NATIONAL PINELANDS RESERVE

In addition to the NJ Pinelands, the Pinelands National Reserve area is also present in the study area. This area is also within the CAFRA zone and has been determined to be under the jurisdiction of CAFRA policies regarding land use. The Pinelands Comprehensive Management Plan acknowledges this "overlap" and notes, "In the Pinelands National Reserve, the Division of Coastal Resources, through the CAFRA permit process, implements the Pineland's Management Programs".

CAFRA

The CAFRA regions within the study area include: the Delaware Bayshore Region, the Great Egg Harbor Region, and the Southern Area. The majority of the study area is within the Delaware Bayshore and Great Egg Harbor Regions, with the southern limits (Cape May County) within the Southern Area. Both the Delaware Bayshore and Great Egg Harbor Regions are considered "Limited Growth Areas" while the southern area is considered an "Extension Region". Each Region or Area has a general policy concerning land use and is detailed below:

Limited Growth Areas

"The general policy in these areas is that conservation is more important than development and environmental sensitivity is therefore weighted more heavily than in other areas. In the Delaware Bayshore, the concern is the conservation of agricultural land. In the Great Egg Harbor River Basin regions the concern is conservation of the natural environmental. The spread of development must, therefore be highly restricted".

Extension Regions

"The general policy in these areas is to promote nodal growth based on existing centers of development and to limit ribbon and scattered development along minor roads".

These are the general policies regarding land use in the CAFRA Zone and the National Pineland's Reserve, within the study area. Several specific policies related to transportation improvements requiring detailed analysis justifying the need, and alternative selected would also require compliance. Moreover, a major concern would be the potential for secondary impacts which also has specific CAFRA policies regarding this issue that would require compliance. Any potential secondary development would be inconsistent in the "Limited Growth Areas", but may be allowed in the "Extension Region" where the proposed alternatives would end. Finally, CAFRA policies, as policies of the NJ Pinelands, consider the study area visually sensitive. Design considerations would be required to mitigate any impacts to natural and manmade landscapes as well as at river crossings.

COUNTY AGRICULTURAL DEVELOPMENT AREAS (ADA'S)

Several ADA's are located in the Cape May County portion of the study area. A total of ten are in Dennis Township, five in Upper Township, two in Middle Township, and one within Woodbine City. Transportation or other non-agricultural uses are not prohibited in ADA's, however an "evaluation of alternatives which would not include action in the agricultural area" must be documented. This information must be forwarded to the State Agricultural Development Committee for review.

Also, related to Agriculture, are farms enrolled in an Eight (8) Year Preservation Program which prohibits any use not related to farming within the boundaries of farmsteads. These areas must be totally avoided by any proposed improvements in the study area. Three such farms are located in the study area but are not crossed by the options under consideration.

CONCLUSION

Any project, particularly a freeway on new alignment, would be strictly scrutinized by the Pineland's Commission, and NJDEP due to the policies previously discussed. Even though these land use policies are somewhat restrictive, transportation improvements can be implemented. However, particular concern to the minimization of environmental and visual impacts, as well as creating the potential for induced development are prime issues that would require detailed analysis once an option is carried forward as an alternative. Appropriate design measures to minimize the impact of any capacity improvement to the existing network would be preferred over constructing a new alignment in this environmentally sensitive area.

BIBLIOGRAPHY

State of New Jersey, Department of Environmental Protection, Division of Coastal Resources, Bureau of Planning and Project Review, "Rules on Coastal Resources and Development, N.J.A.C. 7:7E-1.1 et. seq." February 1986, August 20, 1990, Revisions.

State of New Jersey Pinelands Commission, "Comprehensive Management Plan for the Pinelands National Reserve (National Parks and Recreation Act, 1978) and Pinelands Area (New Jersey Pinelands Protection Act, 1979)" November 1980, March 1990 Revisions.

CONCLUSION

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BIBLIOGRAPHY

State of New Jersey, Department of Environmental Protection, Division of Coastal Resources, Bureau of Planning and Project Review, "Rules on Coastal Resources and Development, N.J.A.C. 7:7E-1.1 et. seq." February 1986, August 20, 1990, Revisions.

State of New Jersey Pinelands Commission, "Comprehensive Management Plan for the Pinelands National Reserve (National Parks and Recreation Act, 1978) and Pinelands Area (New Jersey Pinelands Protection Act, 1979)" November 1980, March 1990 Revisions.

RT55 FREEWAY STUDY AREA

USGS QUAD SHEET INDEX

MILLVILE 1	FIVE POINTS 2		
DIVIDING CREEK 3	PORT ELIZABETH 4	TUCKAHOE 5	MARMORA 6
	HEISLerville 7	WOODBINE 8	SE AISLE CITY 9
		STONE HARBOR 10	

**ROUTE 55 FREEWAY EXTENSION
LAND USE CONSTRAINTS**

**MILLVILLE QUAD
SHEET 1**

LAND USE CATEGORIES	WITHIN STUDY AREA	CROSSED BY		
		PROPOSED RT55	RT47/670/83	49/50
NJ PINELANDS				
WILD & SCENIC CORRIDOR				
NATIONAL PINELANDS RESERVE/ CAFRA OVERLAP				
CAFRA ZONE	*			
ADA'S				
8 YEAR PRESERVATION FARMSTEAD				
PROPOSED DEVELOPMENTS	2			

COMMENTS

CAFRA ZONE - DELAWARE BAYSHORE - LIMITED GROWTH REGION ON THIS QUAD SHEET BUT BEYOND STUDY AREA.
TWO PROPOSED DEVELOPMENTS ADJACENT TO EXISTING RT 55: SITE B - 90,000 SQ. FT. COMMERCIAL SITE PLAN WITH FINAL APPROVAL; AND SITE C - 148 UNIT SF RESIDENTIAL SUBDIVISION WITH PRELIMINARY APPROVAL. BOTH ARE IN MILLVILLE CITY.

**ROUTE 55 FREEWAY EXTENSION
LAND USE CONSTRAINTS**

**FIVE POINTS QUAD
SHEET 2**

LAND USE CATEGORIES	WITHIN STUDY AREA	CROSSED BY		
		PROPOSED RT55	RT47/670/83	49/50
NJ PINELANDS				
WILD & SCENIC CORRIDOR				
NATIONAL PINELANDS RESERVE/ CAFRA OVERLAP				
CAFRA ZONE				
ADA'S				
8 YEAR PRESERVATION FARMSTEAD				
PROPOSED DEVELOPMENTS	1			

COMMENTS

ONE PROPOSED DEVELOPMENT ADJACENT TO EXISTING RT 49: SITE D - 123 UNIT SF RESIDENTIAL SUBDIVISION WITH PRELIMINARY APPROVAL. DEVELOPMENT IN MILLVILLE CITY.

**ROUTE 55 FREEWAY EXTENSION
LAND USE CONSTRAINTS**

**DIVIDING CREEK QUAD
SHEET 3**

LAND USE CATEGORIES	WITHIN STUDY AREA	CROSSED BY		
		PROPOSED RT55	RT47/670/83	49/50
NJ PINELANDS				
WILD & SCENIC CORRIDOR				
NATIONAL PINELANDS RESERVE/ CAFRA OVERLAP				
CAFRA ZONE	*		*	
ADA'S				
8 YEAR PRESERVATION FARMSTEAD				
PROPOSED DEVELOPMENTS	1			

COMMENTS

ROUTE 47 CORRIDOR CROSSES CAFRA ZONE - DELAWARE BAYSHORE - LIMITED GROWTH REGION.
ONE PROPOSED DEVELOPMENT ADJACENT TO EXISTING RT 55: SITE E - 21 LOT INDUSTRIAL SUBDIVISION WITH PRELIMINARY APPROVAL. DEVELOPMENT LOCATED IN MAURICE RIVER TOWNSHIP.

**ROUTE 55 FREEWAY EXTENSION
LAND USE CONSTRAINTS**

**PORT ELIZABETH QUAD
SHEET 4**

LAND USE CATEGORIES	WITHIN STUDY AREA	CROSSED BY		
		PROPOSED RT55	RT47/670/83	49/50
NJ PINELANDS	*	*	*	*
WILD & SCENIC CORRIDOR	*	*	*	
NATIONAL PINELANDS RESERVE/ CAFRA OVERLAP	*		*	
CAFRA ZONE	*		*	
ADA'S 8 YEAR PRESERVATION FARMSTEAD	*			
PROPOSED DEVELOPMENTS				

COMMENTS

PROPOSED RT 55 CROSSES NJ PINELANDS - FOREST AREA, RURAL DEVELOPMENT AREA, AND MANUMUSKIN RIVER - "WILD & SCENIC CORRIDOR".
 RT47/670/83 CORRIDOR CROSSES MANUMUSKIN "WILD & SCENIC CORRIDOR", EAST SIDE OF RT 47 WITHIN NJ PINELANDS - FOREST AREA AND RURAL DEVELOPMENT AREA, AND PINELANDS' VILLAGE - PORT ELIZABETH WEST SIDE WITHIN NATIONAL PINELANDS RESERVE/CAFRA OVERLAP CAFRA POLICIES APPLY. THIS AREA IS DESIGNATED UNDER CAFRA AS DELAWARE BAYSHORE - LIMITED GROWTH REGION.
 RT 670 CORRIDOR CROSSES NJ PINELANDS RURAL DEVELOPMENT AND FOREST AREAS.
 RT 49 CORRIDOR CROSSES NJ PINELANDS - FOREST AREA. A CAPE MAY COUNTY ADA (AGRICULTURAL DEVELOPMENT AREA) IS WITHIN STUDY AREA BUT IS NOT CROSSED BY ANY ALTERNATIVE.

**ROUTE 55 FREEWAY EXTENSION
LAND USE CONSTRAINTS**

**TUCKAHOE QUAD
SHEET 5**

LAND USE CATEGORIES	WITHIN STUDY AREA	CROSSED BY		
		PROPOSED RT55	RT47/670/83	49/50
NJ PINELANDS	*			*
WILD & SCENIC CORRIDOR	*			*
NATIONAL PINELANDS RESERVE/ CAFRA OVERLAP	*			*
CAFRA ZONE				
ADA'S	*			*
8 YEAR PRESERVATION FARMSTEAD				
PROPOSED DEVELOPMENTS				

COMMENTS

RT 49 CROSSES NJ PINELANDS - FOREST AREA, RURAL DEVELOPMENT AREA, & TUCKAHOE RIVER "WILD & SCENIC CORRIDOR". NJ PINELANDS VILLAGE - TUCKAHOE ALSO PRESENT IN STUDY AREA. NORTH SIDE OF RT 49 DESIGNATED NATIONAL PINELANDS RESERVE/CAFRA OVERLAP - CAFRA ZONE - GREAT EGG HARBOR - LIMITED GROWTH REGION APPLIES. RT 49 ALSO CROSSES CAPE MAY COUNTY ADA (AGR-CULTURAL DEVELOPMENT AREA), HOWEVER NO EIGHT YEAR FARMSTEADS ARE PRESENT.

**ROUTE 55 FREEWAY EXTENSION
LAND USE CONSTRAINTS**

**MARMORA QUAD
SHEET 6**

LAND USE CATEGORIES	WITHIN STUDY AREA	CROSSED BY		
		PROPOSED RT55	RT47/670/83	49/50
NJ PINELANDS	*			*
WILD & SCENIC CORRIDOR				
NATIONAL PINELANDS RESERVE/ CAFRA OVERLAP	*			*
CAFRA ZONE	*			*
ADA'S	*			*
8 YEAR PRESERVATION FARMSTEAD				
PROPOSED DEVELOPMENTS				

COMMENTS

RT 50 CORRIDOR CROSSES NATIONAL PINELANDS RESERVE/CAFRA OVERLAP - CAFRA GREAT EGG HARBOR - LIMITED GROWTH REGION APPLICABLE, AS WELL AS CAFRA SOUTHERN - EXTENSION REGION SOUTH OF CO. RT. 585, AND NJ PINELANDS - RURAL DEVELOPMENT AREA. CAPE MAY COUNTY ADA ALSO CROSSED BY RT 50 CORRIDOR.

**ROUTE 55 FREEWAY EXTENSION
LAND USE CONSTRAINTS**

**HEISLERVILLE QUAD
SHEET 7**

LAND USE CATEGORIES	WITHIN STUDY AREA	PROPOSED RT55	CROSSED BY	
			RT47/670/83	49/50
NJ PINELANDS	*	*	*	
WILD & SCENIC CORRIDOR				
NATIONAL PINELANDS RESERVE/ CAFRA OVERLAP	*			
CAFRA ZONE	*			
ADA'S	*	*	*	
8 YEAR PRESERVATION FARMSTEAD				
PROPOSED DEVELOPMENTS				

COMMENTS

BOTH PROPOSED RT 55 & RT47/670/83 CORRIDORS CROSS NJ PINELANDS - FOREST AREA, AND CAPE MAY COUNTY ADA. CAFRA ZONES WITHIN STUDY AREA BEYOND PROPOSED ALTERNATIVES.

**ROUTE 55 FREEWAY EXTENSION
LAND USE CONSTRAINTS**

WOODBINE/STONE HARBOR QUADS

SHEETS 8 & 10

LAND USE CATEGORIES	WITHIN STUDY AREA	CROSSED BY		
		PROPOSED RT55	RT47/670/83	49/50
NJ PINELANDS	*		*	
WILD & SCENIC CORRIDOR				
NATIONAL PINELANDS RESERVE/ CAFRA OVERLAP	*	*	*	
CAFRA ZONE	*	*	*	
ADA'S	*	*	*	
8 YEAR PRESERVATION FARMSTEAD	*			
PROPOSED DEVELOPMENTS				

COMMENTS

PROPOSED RT 55 CORRIDOR CROSSES NATIONAL PINELANDS/CAFRA OVERLAP, WITH CAFRA ZONE - SOUTHERN - EXTENSION REGION APPLICABLE. ALSO 2 CAPE MAY COUNTY ADA'S CROSSED.

RT 47/670/83 CORRIDOR - NORTH SIDE FOR A PORTION OF CORRIDOR, WITHIN NJ PINELANDS - FOREST AREA AND RURAL DEVELOPMENT AREA. REMAINDER OF CORRIDOR CROSSES NATIONAL PINELANDS RESERVE/CAFRA OVERLAP WITH CAFRA - SOUTHERN - EXTENSION REGION APPLICABLE. FOUR (4) CAPE MAY COUNTY ADA'S ALSO CROSSED BY ALIGNMENT.

**ROUTE 55 FREEWAY EXTENSION
LAND USE CONSTRAINTS**

**SEA ISLE CITY QUAD
SHEET 9**

LAND USE CATEGORIES	WITHIN STUDY AREA	CROSSED BY		
		PROPOSED RT55	RT47/670/83	49/50
NJ PINELANDS				
WILD & SCENIC CORRIDOR				
NATIONAL PINELANDS RESERVE/ CAFRA OVERLAP	*			*
CAFRA ZONE	*			
ADA'S	*			
8 YEAR PRESERVATION FARMSTEAD				
PROPOSED DEVELOPMENTS				

COMMENTS

RT 50 CORRIDOR CROSSES NATIONAL PINELANDS RESERVE/CAFRA OVERLAP WITH CAFRA - SOUTHERN - EXTENSION REGION APPLICABLE. CAPE MAY COUNTY ADA WITHIN STUDY CORRIDOR BUT NOT CROSSED BY VARIOUS ALTERNATIVES.

NEW JERSEY DEPARTMENT OF TRANSPORTATION

MEMORANDUM

To: Elkins Green

From: Anupam I. Gandhi 

Subject: Route 55 Freeway Extension
4(f) Resources
Inventory & Impacts

Date: September 18, 1991

Attached for your use is an Inventory & Impacts document, containing an inventory of 4(f) resources and an analysis of impacts to these resources due to a new Route 55 freeway alignment and various upgrades to the existing corridor of Routes 49/50 and 47/670/83.

This document highlights the 4(f) properties affected by various improvements under consideration and discusses the regulatory compliance that would be required when a 'use' is made of a 4(f) land.

For any questions related to this document, please contact me at 5-5264.

AIG/aig

cc: D. Cox (with att); BPE

ROUTE 55 FREEWAY EXTENSION FEASIBILITY STUDY

4 (f) RESOURCES INVENTORY & IMPACTS

**PREPARED BY
ANUPAM I. GANDHI
BUREAU OF ENVIRONMENTAL ANALYSIS, SEPTEMBER 1991**

ROUTE 55 FREEWAY EXTENSION
4 (f) RESOURCES
INVENTORY & IMPACTS

INTRODUCTION

The main purpose of this feasibility study was to investigate the possibility of extending Route 55 from its present southern terminus in Cumberland County to the Garden State Parkway in Cape May County (Exhibit A). In addition to a new Route 55 freeway alignment, this project studied the feasibility of upgrading existing roadways i.e the Routes 49/50 and Routes 47/670/83 corridors, as possible alternatives, to a new Route 55 freeway alignment.

METHODOLOGY

To keep the order of magnitude in perspective, a corridor was defined to focus this study. The study corridor encompassed the new Route 55 freeway alignment and bypasses and existing Routes 47/670/83. For Routes 49/50, the study focussed on a 500' on either side of the roadway.

BEA's involvement in this project was to identify all of the Social, Economic and Environmental constraints within this study corridor. Once the identification of these resources was completed, the next phase was to analyze the impacts on these environmental resources and a prepare a general impact statement. The scope of this paper is limited only to the identification of 4(f) resources and the impacts of various upgrades and alignments on these resources.

INVENTORY OF 4(f) RESOURCES

EXHIBIT B

1. MILVILLE		QUAD #153
Green Acres	No County or Municipal park	
Natural Areas		
Natural Land Trusts		
Parks & Forests		
Fish, Game & Wildlife Mgt. Area	None	
2. FIVE POINTS		QUAD #154
Green Acres	No County or Municipal park	
Natural Areas		
Natural Land Trusts		
Parks & Forests		
Fish, Game & Wildlife Mgt. Area	Menatico Ponds	
3. DIVIDING CREEK		QUAD #163
Green Acres	No County or Municipal park	
Natural Areas	None	
Natural Land Trusts		
Parks & Forests		
Fish, Game & Wildlife Mgt. Area	Edward G. Bevan	
4. PORT ELIZABETH		QUAD #164
Green Acres	No County or Municipal park	
Natural Areas		
Natural Land Trusts		
Parks & Forests	Belleplain State Forest	
Fish, Game & Wildlife Mgt. Area	Menatico Ponds, Peaslee	
5. TUCKAHOE		QUAD #165
Green Acres	No County park, Four Green Acres Municipal parks	
Natural Areas		
Natural Land Trusts		
Parks & Forests	Belleplain State Forest	
Fish, Game & Wildlife Mgt. Area	Lester G. MacNamara, Peaslee	

MARMORA	QUAD #166
----------------	------------------

Green Acres	No County park, Two Green Acres Municipal parks
Natural Areas	
Natural Land Trusts	
Parks & Forests	
Fish, Game & Wildlife Mgt. Area	Lester G. MacNamara

7. HEISLERVILLE	QUAD #171
------------------------	------------------

Green Acres	No County or Municipal park
Natural Areas	
Natural Land Trusts	
Parks & Forests	Belleplain State Forest
Fish, Game & Wildlife Mgt. Area	Dennis Creek (may be in study corridor)

WOODBINE	QUAD #172
-----------------	------------------

Green Acres	No County park, One Green Acres Municipal park
Natural Areas	Cape May Wetlands
Natural Land Trusts	
Parks & Forests	Belleplain State Forest, Great Sound
Fish, Game & Wildlife Mgt. Area	Beaver Swamp, Dennis Creek, Proposed Cape May National Wildlife Refuge

SEA ISLE CITY	QUAD #173
----------------------	------------------

Green Acres	No County park, One Green Acres Municipal park
Natural Areas	Cape May Wetlands
Natural Land Trusts	
Parks & Forests	Great Sound
Fish, Game & Wildlife Mgt. Area	Marmora, Proposed Cape May National Wildlife Refuge

10. STONE HARBOR	QUAD #175
-------------------------	------------------

Green Acres	One Green Acres County Park, No Municipal park
Natural Areas	
Natural Land Trusts	None
Parks & Forests	Great Sound
Fish, Game & Wildlife Mgt. Area	

INVENTORY OF ENVIRONMENTAL CONSTRAINTS

Based on these study areas, an inventory of 4(f) resources was prepared earlier in May 1991. These resources were mainly Green Acres Parks, Natural Areas, Natural Land Trusts, Parks and Forests and Fish, Game and Wildlife Management Areas. The information for this inventory was extracted by a search through the BEA's existing NJDEP's Environmental Information Inventory. This information was then delineated on a set of USGS Quad Sheets and listed on a set of summary tables for convenience in cross referencing the information. Exhibit B summarizes this inventory of 4(f) resources within the predefined study areas.

4(f) PROCESS IN GENERAL

Section 4(f) of the Department of Transportation Act (49 U.S.C., Section 303) sets forth the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites. It requires the Secretary of Transportation to cooperate and consult with the Secretaries of the Interior, Housing and Urban Development, and Agriculture, and with the States, in developing transportation plans and programs that include measures to maintain or enhance the natural beauty of lands crossed by transportation activities or facilities. However, it does allow the Secretary to approve a transportation program or project requiring the use of land protected by Section 4(f) if a determination is made that (1) there is no prudent and feasible alternative to the 'use' of this land; and (2) the transportation program or the project includes all possible planning to minimize harm to the property resulting from such use.

GREEN ACRES

When a county has received Green Acres funding, it has entered into an agreement with the state not to dispose of or divert from a recreational use any of its inventoried open space without obtaining approvals from Green Acres and the State House Commission. This would mean that in addition to preparing a Section 4(f) evaluation and getting FHWA's approval, a Green Acres Encumbrance has to be removed in coordination with the Green Acres (NJDEP) and the State House Commission.

SUBSECTION II-D

Wetlands Emphasis

NEW JERSEY DEPARTMENT OF TRANSPORTATION

M E M O R A N D U M

TO: Elkins Green

FROM: Bruce Hawkinson 

SUBJECT: Route 55 (Extension)
Feasibility Study

DATE: May 6, 1991

Attached is the Permits/Ecology Section's input for the above captioned project. Included are the written narrative and the constraint maps. This input consists of an ecological inventory of the study area. Possible impacts will be provided at a later date when the proposed alignments are determined.

If you have any questions regarding this material, please call Kevin Biglin at 5-3469.

KB:slz
Attachment

c: D. Cox

ROUTE 55 STUDY

ECOLOGY: Methods and Existing Conditions

- A. Geology and Groundwater Resources
- B. Soils
- C. Water Quality
- D. Upland Vegetation
- E. Wetlands
- F. Threatened and Endangered Species
- G. Permits and Approvals
- H. Summary

A. Geology and Groundwater Resources

1. Methods

Geological resources were investigated through the review of published documents. Primary reference was made to Ground Water Resources, Cumberland County, New Jersey, Division of Water Resources, Special Report No. 34 and New Jersey Pinelands Comprehensive Management Plan, 1980.

2. Existing Conditions

The study area is found in the Atlantic Coastal Plain physiographic province which is characterized by low flat land areas, extensive wetlands and several meandering rivers.

The most important formation underlying the study area is the Cohansey Sand, which was deposited more than five million years ago. Although it is covered by a thin veneer of more recent sediments, the Cohansey has outcrops on the lower slopes of hills at elevations between 40 and 60 feet. Within the region, the Cohansey is indistinguishable from the uppermost portion of the underlying Kirkwood formation, which like the Cohansey is water-bearing; the two together are known as the Cohansey-Kirkwood aquifer. This aquifer has a maximum thickness of 180 feet and holds billions of gallons of water in storage (see figure 1).

Overlying the Cohansey in upland areas above an elevation of 60 feet is the Bridgeton Formation, composed chiefly of sand and gravel.

Most of the water supplies in the study area are obtained from groundwater pumped from the Cohansey-Kirkwood aquifer. The Cohansey-Kirkwood Formation is part of the Coastal Plain Aquifer which is considered to be a Sole Source Aquifer by the Environmental Protection Agency (EPA). In general, water quality is good except for excessive iron concentrations in some localities. High concentrations of dissolved solids and chlorides are found in those areas where the aquifer has been invaded by salt water.

B. Soils

1. Methods

Reference for this particular subject was the Soil Survey of Cumberland County (U.S.D.A., SCS, 1978) and the Soil Survey of Cape May County (U.S.D.A., SCS, 1979). Soil associations which occur within the study area were determined and described.

2. Existing Conditions

There are eight soil associations within the study area: Aura-Downer-Sassafras, Hammonton-Fallsington-Pocomoke, Evesboro-Klej-Lakewood, Muck-Atsion-Berryland, Tidal Marsh, Downer-Sassafras-Fort Mott, Hammonton-Woodstown-Klej and Pocomoke-Muck. A brief summary of these soil associations and their characteristics follows. The location of these soil associations are depicted on figures 2 and 3. It is important to note that those soils displaying hydric characteristics are almost always associated with wetlands.

Aura-Downer-Sassafras - This association is nearly level to sloping, well-drained, loamy, sandy and gravelly soils found on uplands. Aura soils are generally at the highest elevation and are nearly level or gently sloping. Sassafras and Downer soils are either next to Aura soils or occur separately.

Hammonton-Fallsington-Pocomoke - This association is nearly level to gently sloping, moderately well drained to very poorly drained, loamy and sandy soils found on uplands and lowlands. Hammonton soils have a moderately high seasonal water table. Fallsington and Pocomoke soils are on lowlands and are poorly drained or very poorly drained. The water table is high for more than 6 months of the year. All three of these soils are classified as "hydric" by the U.S. Department of Interior (USDOI), Fish and Wildlife Service (Wetlands of New Jersey, 1985).

Evesboro-Klej-Lakewood - This association is nearly level to moderately steep, excessively drained to somewhat poorly drained sandy soils located on uplands. All of these soils are deep and very sandy. Evesboro and Lakewood soils are excessively drained; Klej soils are moderately well drained or somewhat poorly drained. The soils have low available water capacity and low natural fertility. Klej soils display hydric conditions in few places and additional verification is needed according to the U.S. Department of the Interior (USDOI), Fish and Wildlife Service (Wetlands of New Jersey, 1985).

Muck-Atsion-Berryland - This association is nearly level, poorly drained and very poorly drained, organic and sandy soils found on lowlands. Muck is very poorly drained and highly organic. Atsion soils are poorly drained and sandy. Berryland soils are very poorly drained and sandy. The water table is high for 6 months or more in these soils. All three of these soils are classified as "hydric" by the U.S. Department of the Interior, Fish and Wildlife Service (Wetlands of New Jersey, 1985).

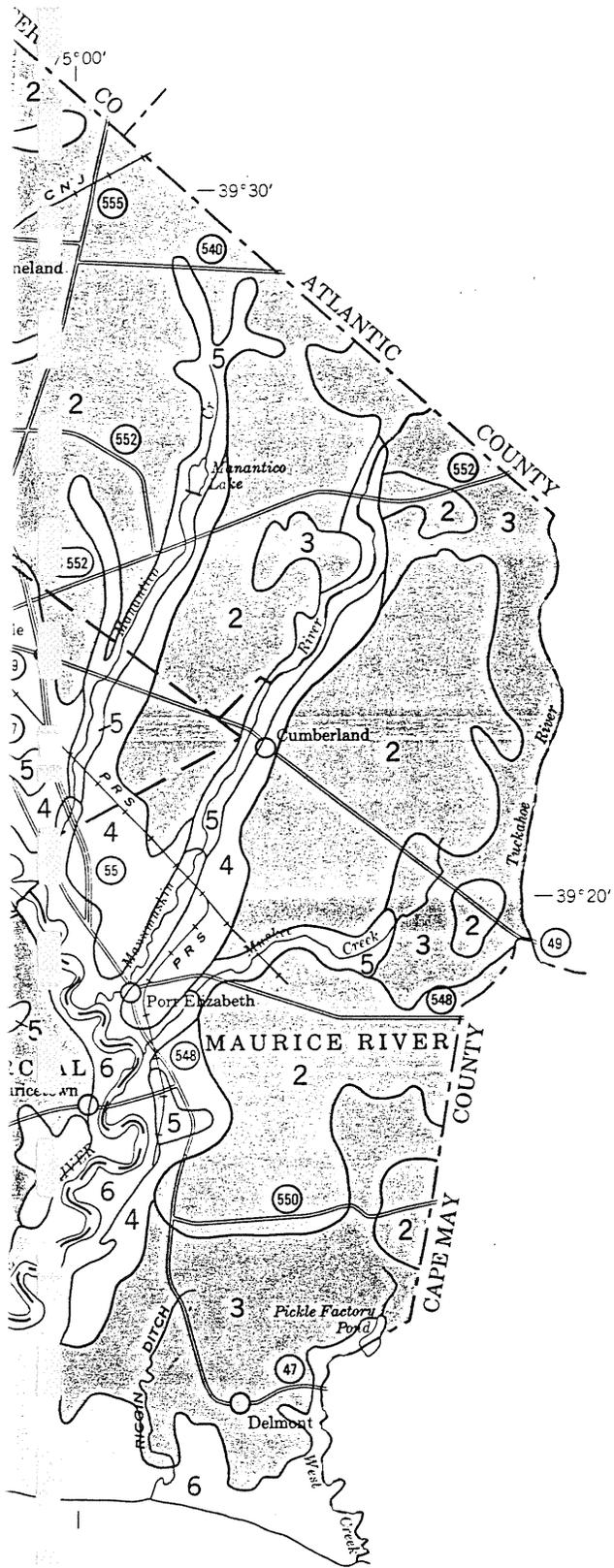
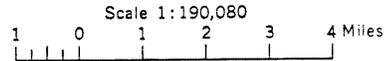
Tidal Marsh - This association is nearly level, very poorly drained, silty or mucky tidal flats that are subject to daily flooding. Tidal Marsh normally supports a stand of grasses that can tolerate salts and daily flooding. Drained areas of Tidal Marsh oxidize upon drying. Because of sulfur, these areas are so acidic that no plants grow. This soil is classified as "hydric" by the U.S. Department of the Interior, Fish and Wildlife Service (Wetlands of New Jersey, 1985).

Figure 2



U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NEW JERSEY AGRICULTURAL EXPERIMENT STATION
COOK COLLEGE, RUTGERS, THE STATE UNIVERSITY
NEW JERSEY DEPARTMENT OF AGRICULTURE

GENERAL SOIL MAP CUMBERLAND COUNTY, NEW JERSEY



SOIL ASSOCIATIONS*

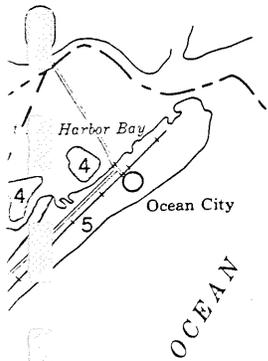
- 1 Matapeake-Chillum-Mattapex association: Nearly level to sloping, well drained and moderately well drained silty soils; on uplands
- 2 Aura-Downer-Sassafras association: Nearly level to sloping, well-drained, loamy, sandy and gravelly soils; on uplands
- 3 Hammonton-Fallsington-Pocomoke association: Nearly level to gently sloping, moderately well drained to very poorly drained, loamy and sandy soils; on uplands and lowlands
- 4 Evesboro-Klej-Lakewood association: Nearly level to moderately steep, excessively drained to somewhat poorly drained sandy soils; on uplands
- 5 Muck-Atsion-Berryland association: Nearly level, poorly drained and very poorly drained, organic and sandy soils; on lowlands
- 6 Tidal Marsh association: Nearly level, very poorly drained, silty and mucky tidal flats that are subject to daily flooding; on lowlands

* Texture terms in the name of the associations refer to the surface layer of the major soils in each association.

Compiled 1977

Figure 3



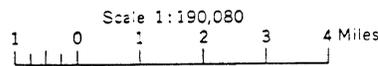


U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

NEW JERSEY AGRICULTURAL EXPERIMENT STATION
COLLEGE OF AGRICULTURE AND ENVIRONMENTAL SCIENCE
NEW JERSEY DEPARTMENT OF AGRICULTURE
STATE SOIL CONSERVATION COMMITTEE

GENERAL SOIL MAP

CAPE MAY COUNTY, NEW JERSEY



SOIL ASSOCIATIONS

- 
 Downer-Sassafras-Fort Mott association: Nearly level and gently sloping, well-drained soils that have a loamy subsoil and a dominantly loamy and sandy substratum
- 
 Hammonton-Woodstown-Klej association: Nearly level, moderately well drained and somewhat poorly drained soils that have a dominantly loamy subsoil and a sandy substratum
- 
 Pocomoke-Muck association: Nearly level, very poorly drained soils that have a loamy subsoil and a sandy substratum and soils that are organic throughout
- 
 Tidal marsh association: Nearly level, very poorly drained silty or mucky tidal flats that are subject to daily flooding
- 
 Coastal beach-Urban land association: Nearly level to strongly sloping barrier beaches and areas developed for residential and commercial uses

Compiled 1976

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

Downer-Sassafras-Fort Mott - The association is nearly level and gently sloping, well-drained soils that have a loamy subsoil and a dominantly loamy and sandy substratum. These soils are in relatively high positions on the landscape and generally are well drained, but a small acreage of the soils in the lowest positions has a water table that is seasonally within 2.5 to 3.5 feet of the surface.

Hammonton-Woodstown-Klej - This association is nearly level, moderately well drained and somewhat poorly drained soils that have a dominantly loamy subsoil and a sandy substratum. These soils are on intermediate positions on the landscape. The water table of these soils fluctuates and is seasonally moderately high. It ranges from a depth of 1 to 3 feet at the highest to 4 feet or more in summer. Hammonton and Klej soils display hydric conditions in few places and additional verification is needed according to the U.S. Department of the Interior, Fish and Wildlife Service (Wetlands of New Jersey, 1985).

Pocomoke-Muck - This association is nearly level, very poorly drained soils that have a loamy subsoil and a sandy substratum and soils that are organic throughout. These soils are in the lowest positions on the landscape drained by freshwater. Pocomoke soils have a surface layer and a subsoil of sandy loam. Muck is highly organic. Both Pocomoke soils and Muck have a water table that is at the surface in winter, and if saturated both have low bearing capacity. Pocomoke soils and Muck are classified as "hydric" by the U.S. Department of the Interior, Fish and Wildlife Service (Wetlands of New Jersey).

C. Water Quality

1. Methods

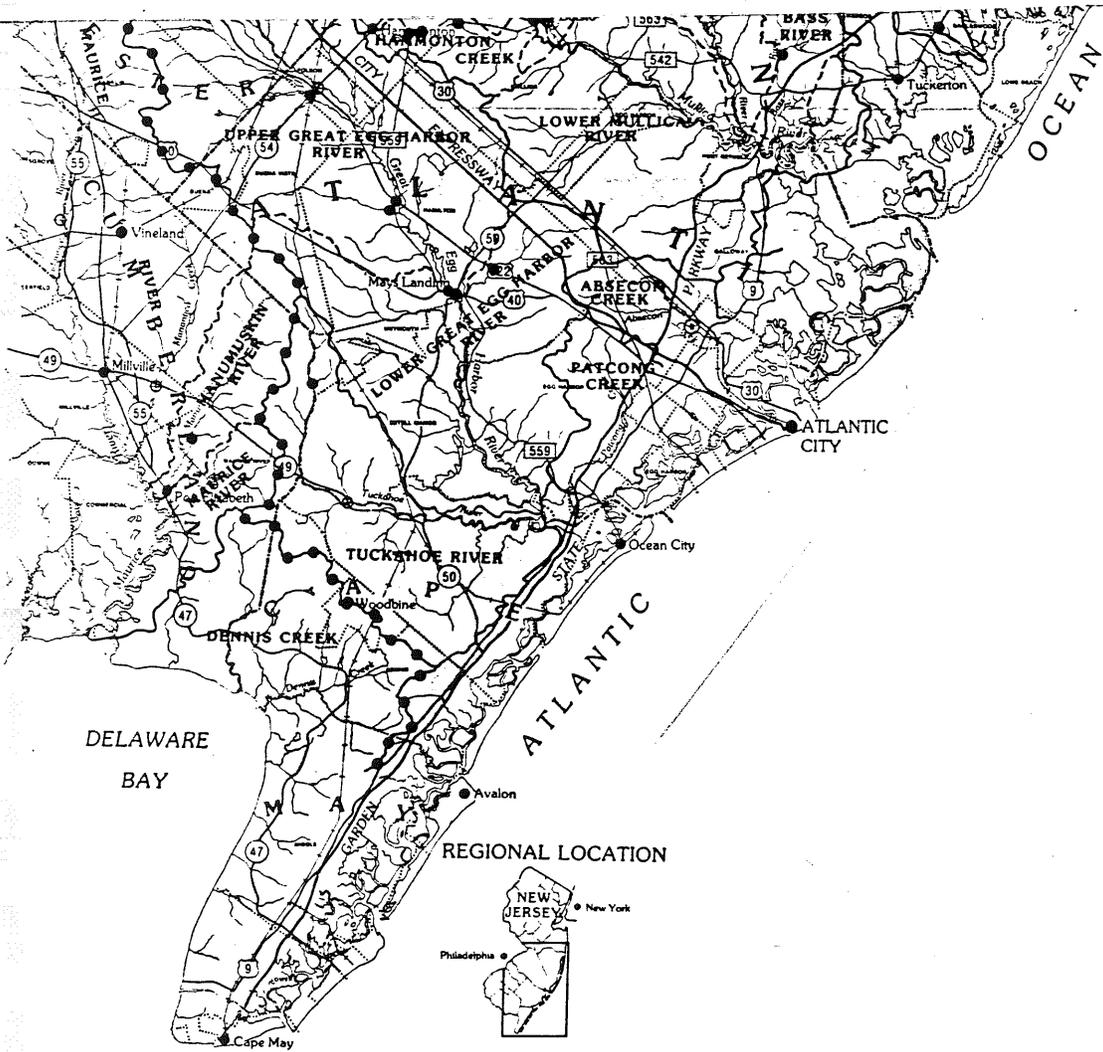
The New Jersey Pinelands Comprehensive Management Plan, 1980 and the Conservation Plan for the Manumuskin River Watershed, 1988 were the main references used for this section.

2. Existing Conditions

The study area lies within the Maurice River, Dennis Creek and Tuckahoe River drainage basins. Most of the streams within the study area are classified as P1-Pinelands Waters by the NJDEP. Surface water quality criteria for P1 classifications shall be maintained as to quality in their existing state or that quality necessary to attain or protect the designated uses, whichever is more stringent. Figure 4 shows the waterways in the study area and table 1 gives the NJDEP classification.

The quality of the surface water within the study area is considered very good; especially the Manumuskin River which is part of the Maurice River drainage basin. In the Betz, Converse, and Murdoch, 1980 study, water quality data collected from 80 stations within the one million acre Pinelands National Reserve was compared and only two of the stations were found to have "pristine" water quality. One of these stations is the Manumuskin River at Fries Mill Road (see figure 5). The ratings for the Maurice River, Dennis Creek and Tuckahoe River basins are illustrated in table 2.

Figure 4



PLA

TABLE 1

<u>Waterbody</u>	<u>NJDEP Classification</u>
Manantico Creek	FW-NT
Manumuskin River	P1
Tuckahoe River	P1 + FW2-NT/SE1(C1) in Peaselee Wildlife Area
Mirey Run	FW2-NT/SE1(C1)
Cedar Swamp Creek	P1
Muskee Creek	P1
Clear Run	P1
West Creek	P1 and FW1 in Bellplain Forest Area
East Creek	P1 and FW2-NT/SE1(C1) in Dennis Creek Wildlife Area
Willis Run	P1
Old Robins Branch	P1
Ludlam's Pond	P1
Johnson's Pond	P1
Dennis Creek	P1 and FW2-NT/SE1(C1) in Dennis Creek Wildlife Area

P1 = Pinelands Water

FW2-NT = Freshwaters non-trout

FW1 = Fresh waters that originate in and are wholly within state parks, and wildlife areas, that are to be maintained in their natural state of quality.

SE1 = Saline waters of estuaries

C1 = Category one waters are designated for implementing the Antidegradation Policies in this subchapter, for protection from measurable changes in water quality.

Table 2

—Maurice River Drainage Basin Assessment

Water Quality Station		Point Source					Nonpoint Source		Land Use	
		Drainage Area (sq. mi)	Water Quality Index *	Quantity of Sewage Plant Discharge (1000 gal./day/sq. mi.)	Number of Sewage Treatment Plants	Number of Industrial Dischargers	Number of Landfills	Number of Effluent Spray Irrigation Sites	Percent Developed	Percent Agricultural
Number	Location									
01412100	Manumuskin River near Manumuskin	32.1	5	0	0	1	0	0	2.4	6.8
	Maurice River Below Station 01412100	—	—	—	0	0	0	3	0	—

* Index values = 5 (pristine) to 15 (most disturbed)

—Tuckahoe River Drainage Basin Assessment

Water Quality Station		Point Source					Nonpoint Source		Land Use	
		Drainage Area (sq. mi)	Water Quality Index *	Quantity of Sewage Plant Discharge (1000 gal./day/sq. mi.)	Number of Sewage Treatment Plants	Number of Industrial Dischargers	Number of Landfills	Number of Effluent Spray Irrigation Sites	Percent Developed	Percent Agricultural
Number	Location									
11411290	Tuckahoe River near Estell Manor	8.8	5	0	0	0	0	0	8.2	9.6
11411300	Tuckahoe River at Head of River, State Route 49	30.8	7	0	0	1	1	0	—	—
	Below Station 11411300	—	—	0	0	2	3	0	—	—
	TOTAL Tuckahoe River Basin	70.	—	—	—	—	—	—	3	5

* Index values = 5 (pristine) to 15 (most disturbed)

—Dennis Creek Drainage Basin Assessment

Water Quality Station		Point Source					Nonpoint Source		Land Use	
		Drainage Area (sq. mi)	Water Quality Index	Quantity of Sewage Plant Discharge (1000 gal./day/sq. mi.)	Number of Sewage Treatment Plants	Number of Industrial Dischargers	Number of Landfills	Number of Effluent Spray Irrigation Sites	Percent Developed	Percent Agricultural
Number	Location									
	TOTAL Dennis Creek Basin	72	—	0	1	0	3	0	3	13

The most unique and sensitive characteristic of Pineland waters is the low pH. This controls the composition of the aquatic community. If the characteristic pH is altered, the species pool will change. The classic response to elevated pH in Pinelands streams is a reduced abundance of characteristic species, particularly those restricted in their regional distribution to the Pinelands, and an increased abundance of peripheral and introduced species.

D. Upland Vegetation

1. Methods

Referenced for the particular subject was the New Jersey Pinelands Comprehensive Management Plan, 1980.

2. Existing Conditions

The uplands in the study area support two major vegetation types or associations, pine-oak forests and oak-pine forests. Fire and timber cutting play important roles in determining the composition of these upland forests.

The oak-pine forest is the dominant upland vegetation in the study area (see Figure 6). The southern red oak is the most prominent oak with chestnut, white, scarlet and post oaks also occurring. Mixed in with the oaks are pitch pine and an occasional stand of shortleaf pine. The shrubs present in the oak-pine forests are predominantly lowbush blueberry, black huckleberry and in some areas mountain laurel.

The pine-oak forest is also found in study area. Pitch pine is the dominant tree of the upland pine-oak forest. Associated with this species are blackjack oak, white oak, and southern red oak. The understory in the pine-oak forest include scrub oak, lowbush blueberry and black huckleberry.

The upland forests in the study area have a very high value for wildlife habitat. This is due to the large forest areas which are undisturbed in nature. As will be discussed in the Endangered and Threatened Species Section, these undisturbed forest areas are critical habitat to some of New Jersey's rarest plants and animals.

E. Wetlands

1. Methods

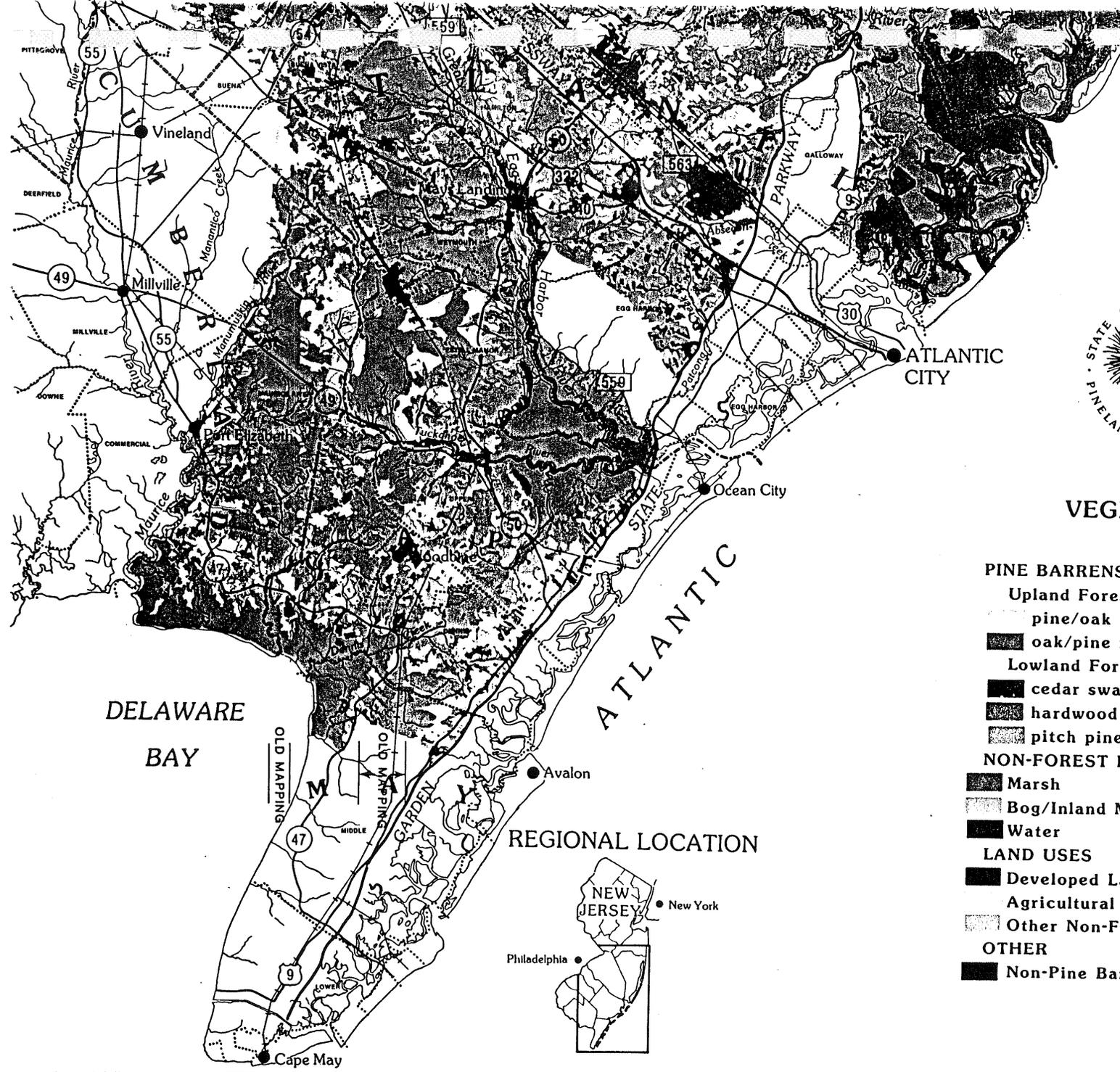
The main reference for this section were the Atlas of National Wetlands Inventory Maps for New Jersey, Tiner, 1984 and New Jersey Pinelands Comprehensive Management Plan, 1980.

Figure 6



VEGETATION

- PINE BARRENS FORESTS**
- Upland Forest Types**
- pine/oak forest
- oak/pine forest
- Lowland Forest Types**
- cedar swamp
- hardwood swamp
- pitch pine lowland forest
- NON-FOREST HABITATS**
- Marsh
- Bog/Inland Marsh
- Water
- LAND USES**
- Developed Land
- Agricultural Land
- Other Non-Forest Areas
- OTHER**
- Non-Pine Barrens Vegetation



REGIONAL LOCATION



2. Existing Conditions

The National Wetlands Inventory Maps (NWI) were used to locate and classify the wetlands in the study area (see figures 7-14). These wetlands were not field verified nor were any field investigations conducted to determine the presence of wetlands that do not appear on the NWI's. The NWI maps reviewed were the Millville, Five Points, Port Elizabeth, Tuckahoe, Marmora, Heislerville, Woodbine and Sea Isle City Quadrangles.

The wetlands in the study area are classified as palustrine forested, palustrine scrub-shrub, palustrine emergent, estuarine and open water. The following is a brief description of each wetland classification.

a. Palustrine Forested Wetlands - (PFO)

The palustrine forested wetlands within the study area are freshwater wetlands that consist of cedar swamps, hardwood swamps and pitch pine lowlands.

These cedar swamps (PFO4) are characterized by dense even-aged stands of Atlantic white cedar. Cedar predominates in the canopy but pitch pine is often present. Red maple, blackgum and sweetbay are also common in the understory. Dangleberry, high-bush blueberry, swamp azalea, fetterbush, sweet pepperbush and bayberry are likely to occur in the shrub layer. The herbaceous growth is rarely very dense, there is a wide variety of species present in areas where there are canopy openings. A rich carpet of Sphagnum mosses covers the ground.

The canopy of hardwood swamp forests (PFO1) is predominantly red maple, associated with blackgum and sweetbay. Although nearly pure stands of broad-leaved hardwoods are common, in some areas pitch pine and white cedar occur in the canopy. They are as abundant as maple, blackgum and sweetbay. The shrubs which occur in the cedar swamps are also present in the hardwood swamps, often forming a very dense understory. American Holly is a major component of the hardwood swamps in the study area.

The pitch pine lowland forests (PFO4) are characterized by a dense canopy composed almost entirely of pitch pine. The understory is often dense, supporting maple and blackgum as well as a variety of lowland shrubs, especially sheep laurel, black huckleberry, dangleberry and staggerbush. The shrub layer varies in height, from relatively low shrubs such as sand myrtle and sheep laurel in drier areas, to tall shrubs such species as highbush blueberry, pepperbush and azalea near the swamps.

b. Palustrine Scrub-Shrub Wetlands - (PSS1, 3 or 4)

The palustrine scrub-shrub wetlands are freshwater wetlands that are dominated by shrubs, including cranberry, leatherleaf, sheep laurel, highbush blueberry, swamp azalea, sweet pepperbush and staggerbush. Sphagnum mosses often carpet the ground.

- c. Palustrine Emergent Wetland - (PEM)
These are freshwater wetlands that are dominated by grasses and sedges.
- d. Estuarine
The estuarine wetlands in the study area are intertidal saline to brackish waters.
1. Estuarine intertidal emergent wetlands (E2EM) are saline with a dominance of spartina, spike grass, hightide bush and phragmites.
 2. Estuarine intertidal emergent wetlands, regularly flooded, oligohaline (E2EMN6) are brackish with a dominance of wild rice, arrow arrum, water smartweed, tearthumb and cattail.
- e. The open waters in the study area are palustrine (POW-freshwater), lacustrine limnetic (L1OW-lake), or estuarine subtidal (E1OW-saline to brackish). These open water areas are not vegetated.

The study area is approximately 40 percent wetlands (Wetlands of New Jersey, 1985 average of wetlands in Cumberland 30.9% and Cape May 52.4% Counties). Wetlands are a very valuable resource because they influence water quality and quantity in the ecosystem by removing nutrients from surface and ground waters, retaining water during dry periods, detaining it during floods, and acting as natural drainage corridors. In addition, the wetlands in the study area support a large number of plant and animal species designated as threatened or endangered by the New Jersey Department of Environmental Protection, the U.S. Department of the Interior, and the Pinelands Commission.

As discussed in the previous paragraph, wetlands are a valuable resource, however, for this document, the quality of the wetlands within the study area was determined by its possible association with endangered or threatened species. This was done by overlaying the Natural Heritage Index Maps for endangered and threatened species with the NWI maps (see figures 7-14).

One wetland area that is of special concern is the estuarine intertidal emergent wetland, regularly flooded, oligohaline (E2EMN6) associated with the Manumuskin River (see figure 8). This wetland is the best example of a brackish intertidal marsh in the state and is also one of the largest wild rice wetlands in the state. Wild rice is a very valuable food source for wildlife. In addition, the largest population of sensitive joint vetch, one of the state's rarest plants, is found within this wetland area (see the Endangered and Threatened Species Section). This area is also in a Natural Heritage delineated priority site for endangered biological diversity.

HOW TO USE THIS ATLAS

The Atlas contains reductions of all 1:24,000 National Wetlands Inventory maps. Maps appear in alphabetical order. Map names can be located on the index map (Figure 2). Each map shows the configuration, location and type of wetlands and deepwater habitats found within a given area.

WETLAND LEGEND

Wetland data are displayed on maps by a series of letters and numbers (alpha-numerics). Mixing of classes and subclasses are represented by a diagonal line. The more common symbols are shown below; less common symbols have been omitted for simplicity. For identifying these latter symbols, the reader should refer to an actual NWI map legend.

Examples of Alpha-numerics:

E2EMN6 = Estuarine (E), Intertidal(2), Emergent Wetland(EM), Regularly Flooded(N), Oligohaline(6)

E2FL = Estuarine(E), Intertidal(2), Flat(FL)

PF01 = Palustrine(P), Forested Wetland(FO), Broad-leaved Deciduous(1)

PEM/OW = Palustrine(P), Emergent Wetland/Open Water(EM/OW)

PFO/SS1 = Palustrine(P), Forested Wetland/Scrub-Shrub Wetland(FO/SS), Broad-leaved Deciduous(1)

SYMBOLOLOGY

Systems and Subsystems:

M 1	=	Marine Subtidal	R 3	=	Riverine Upper Perennial
M 2	=	Marine Intertidal	R 4	=	Riverine Intermittent
E 1	=	Estuarine Subtidal	L 1	=	Lacustrine Limnetic
E 2	=	Estuarine Intertidal	L 2	=	Lacustrine Littoral
R 1	=	Riverine Tidal	P	=	Palustrine
R 2	=	Riverine Lower Perennial	U	=	Upland

Classes (subclasses and modifiers designated where appropriate):

AB = Aquatic Bed

BB = Beach/Bar

EM = Emergent Wetland

EMN6 = Emergent Wetland, Regularly Flooded, Oligohaline

EMP6 = Emergent Wetland, Irregularly Flooded, Oligohaline

EMR = Emergent Wetland, Seasonally Flooded-Tidal

FL = Flat

FO1 = Forested Wetland, Broad-leaved Deciduous

FO2 = Forested Wetland, Needle-leaved Deciduous

FO4 = Forested Wetland, Needle-leaved Evergreen

OW = Open Water/Unknown Bottom

SS1 = Scrub-Shrub Wetland, Broad-leaved Deciduous

SS3 = Scrub-Shrub Wetland, Broad-leaved Evergreen

SS4 = Scrub-Shrub Wetland, Needle-leaved Evergreen

SS5 = Scrub-Shrub Wetland, Dead

SS7 = Scrub-Shrub Wetland, Evergreen

Section F, "Threatened and Endangered Species", has been intentionally deleted from Subsection II-D. Section F can be found in its entirety in Subsection II-B (Endangered Species).

G. Permits & Approvals

The following is a list of possible permits and approvals necessary for any of the alternatives:

U.S. Coast Guard (Bridge) for the crossing of the Manumuskin River, Muskee Creek and Dennis Creek.

U.S. Corps of Engineers (Individual)
Section 404 (Discharge fill in wetlands)
Section 10 (Navigable Waters - Manumuskin River, Muskee Creek and Dennis Creek)

NJDEP CAFRA
NJDEP Wetlands Type B
NJDEP Waterfront Development
NJDEP Riparian
NJDEP Stream Encroachment
NJDEP Freshwater Wetlands (Individual)
NJDEP Water Quality Certificate

Pinelands Commission

Sole Source Aquifer

Federal Wild & Scenic Rivers (Manantico Creek and Manumuskin River under study)

H. SUMMARY

Milliville Quad.

There are 20 threatened or endangered plant and animal species that can be found within the study area. The only wetlands in the study area are the ones associated with Hankins Pond. These wetlands are of high quality (see the Millville NWI map).

Port Elizabeth Quad.

There are 23 threatened or endangered plant and animal species that can be found within the study area. The globally rare sensitive joint vetch is found in the E2EMN6 wetlands associated with the Manumuskin River (see the Port Elizabeth NWI map). The majority of the wetlands in the study area are of high quality. However, medium and average quality wetlands are also in this area (see the Port Elizabeth NWI map). In addition, the water quality of the Manumuskin River is considered pristine within the study area. The other large waterways in the study area are the Muskee Creek, Clear Run, and West Creek.

Heislerville Quad.

There are 15 threatened or endangered plant and animal species that can be found within the study area. The wetlands in the study area are of high and medium quality (see the Heislerville NWI map). The large waterways located in the study area are West Creek and East Creek.

Woodbine Quad.

There are 38 threatened or endangered plant and animal species that can be found within the study area. The wetlands in the study area are predominantly of high to medium quality (see the Woodbine NWI map). The large waterways located in the study area are Ludlam Pond, Johnson Pond, and Dennis Creek.

Five Points Quad.

There are 19 threatened or endangered plant and animal species that can be found within the study area. The wetlands in the study area are high or medium quality (see the Five Points NWI map). The large waterways located in the study area are the Manantico Creek and the Manumuskin River.

Tuckahoe Quad.

There are 20 threatened or endangered plant and animal species that can be found within the study area. The

wetlands in the study area are high, medium and average quality (see the Tuckahoe NWI map). The Tuckahoe River is the only large waterway in this area.

Maramora Quad.

There are 19 threatened or endangered plant and animal species that can be found within the study area. The wetlands in the study area are of high quality (see the Maramora NWI map). The Cedar Swamp Creek is the only large waterway in this area.

Sea Isle City Quad.

There are 14 threatened or endangered plant and animal species that can be found within the study area. The wetlands in the study area are of average quality (see the Sea Isle City NWI map). The only large waterway located in this area is the Cedar Swamp Creek.

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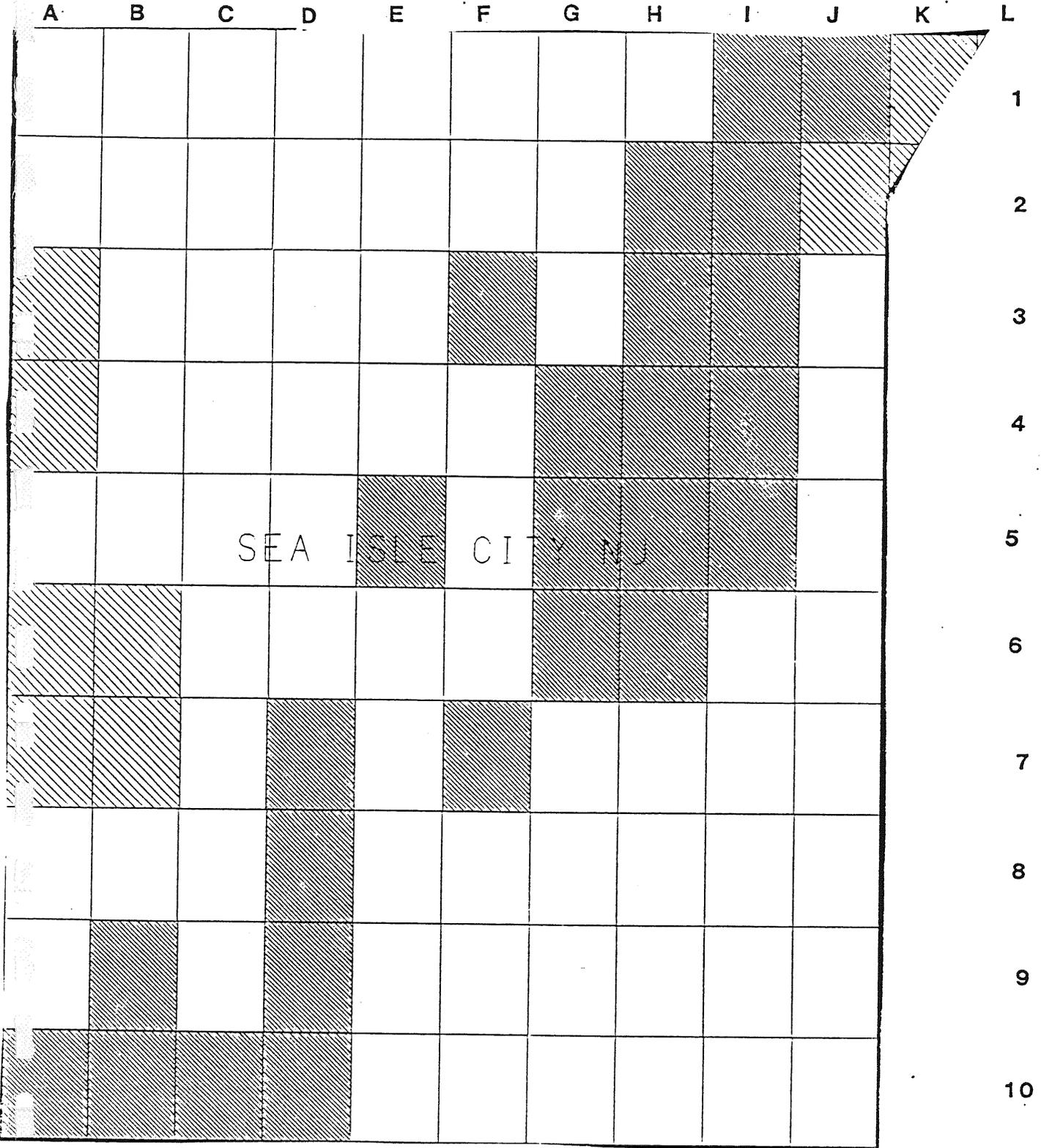
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NATURAL HERITAGE DATA

GENERALIZED LOCATIONS FOR RARE & ENDANGERED ELEMENTS OF NATURAL DIVERSITY

 DOCUMENTED LOCATION
KNOWN PRECISELY

 DOCUMENTED LOCATION
KNOWN WITHIN 1.5MI.



NOTE: THIS IS NOT A COMPLETE MAP OF RARE AND ENDANGERED SPECIES HABITAT FOR THIS AREA. IT REFLECTS DATA ON KNOWN OCCURRENCES COMPILED AS OF THE ABOVE DATE. IT INCLUDES BOTH HISTORICALLY AND RECENTLY DOCUMENTED OCCURRENCES. ADDITIONAL OCCURRENCES MAY BE FOUND ON UNDEVELOPED HABITAT. FOR MORE INFORMATION, CONTACT THE OFFICE OF NATURAL LANDS MANAGEMENT, CN464, TRENTON NJ 08625.

MAY 1988

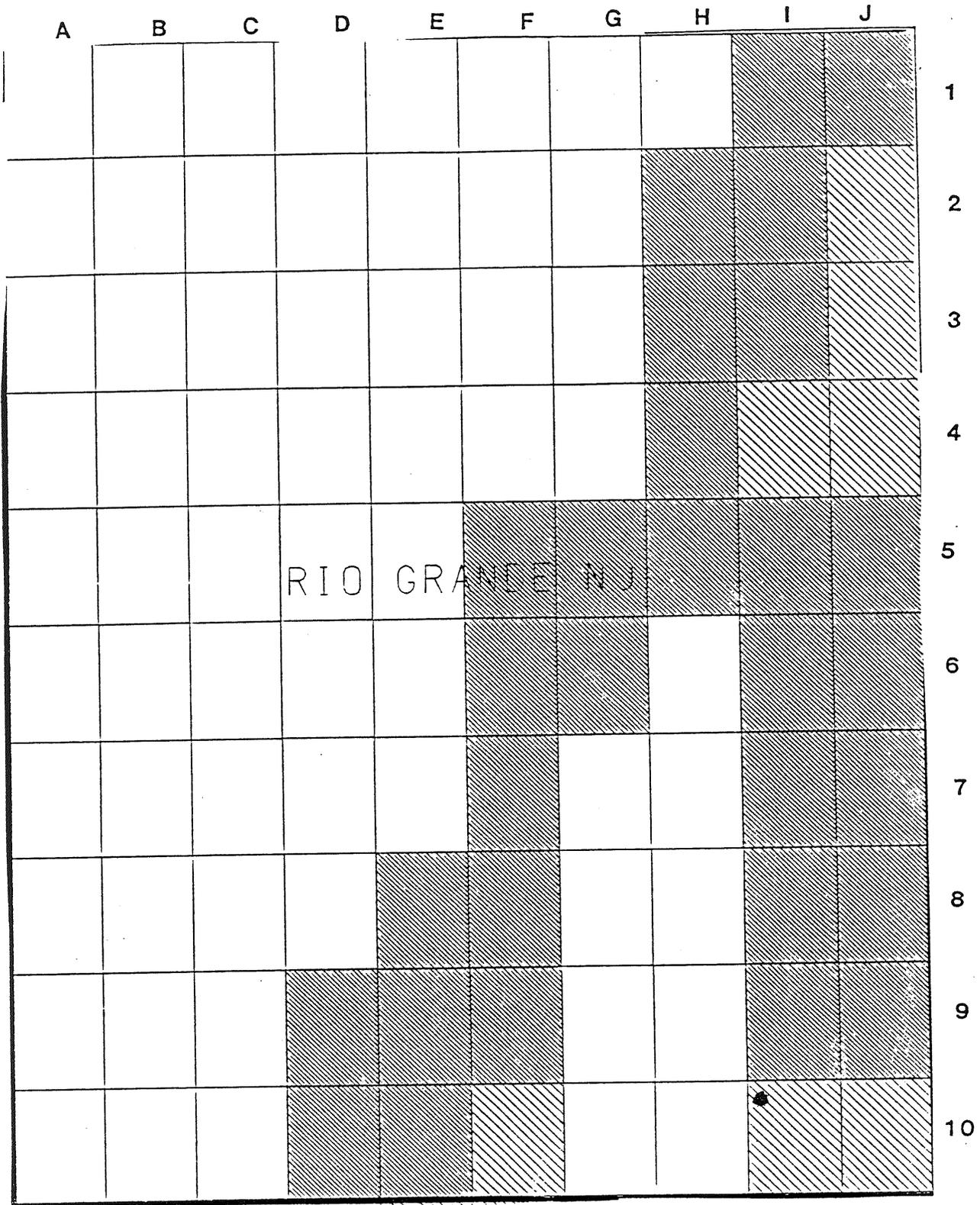
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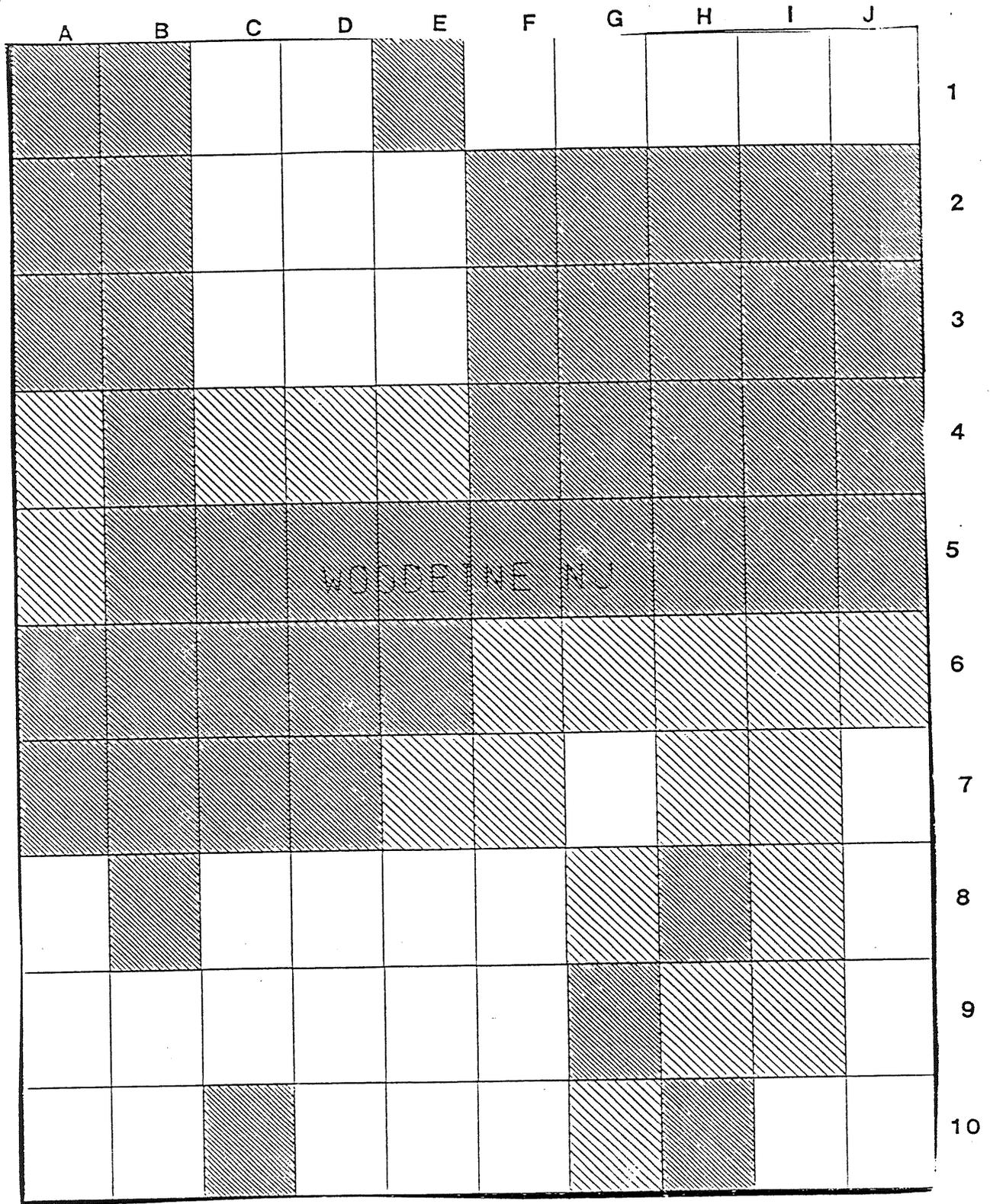
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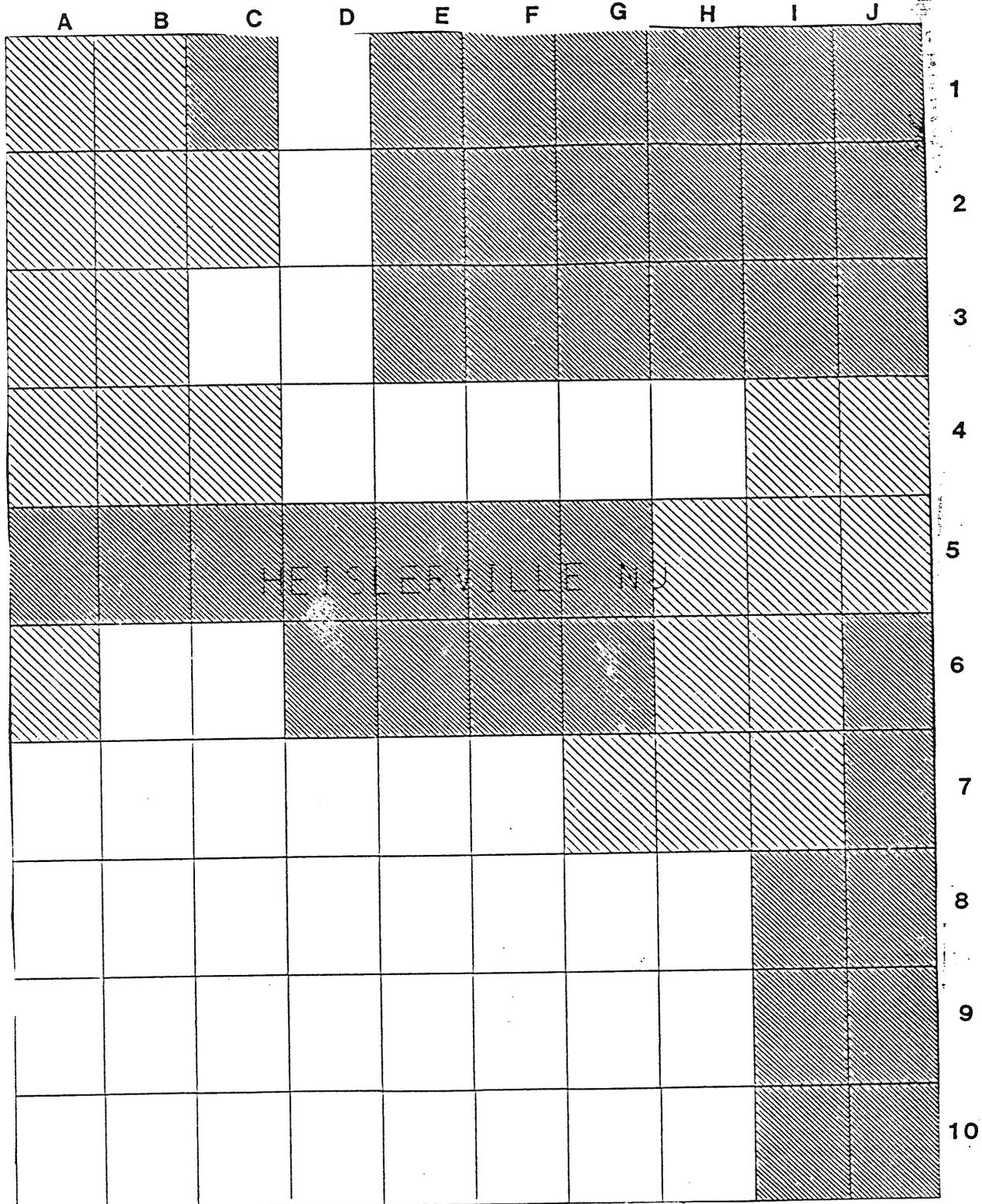
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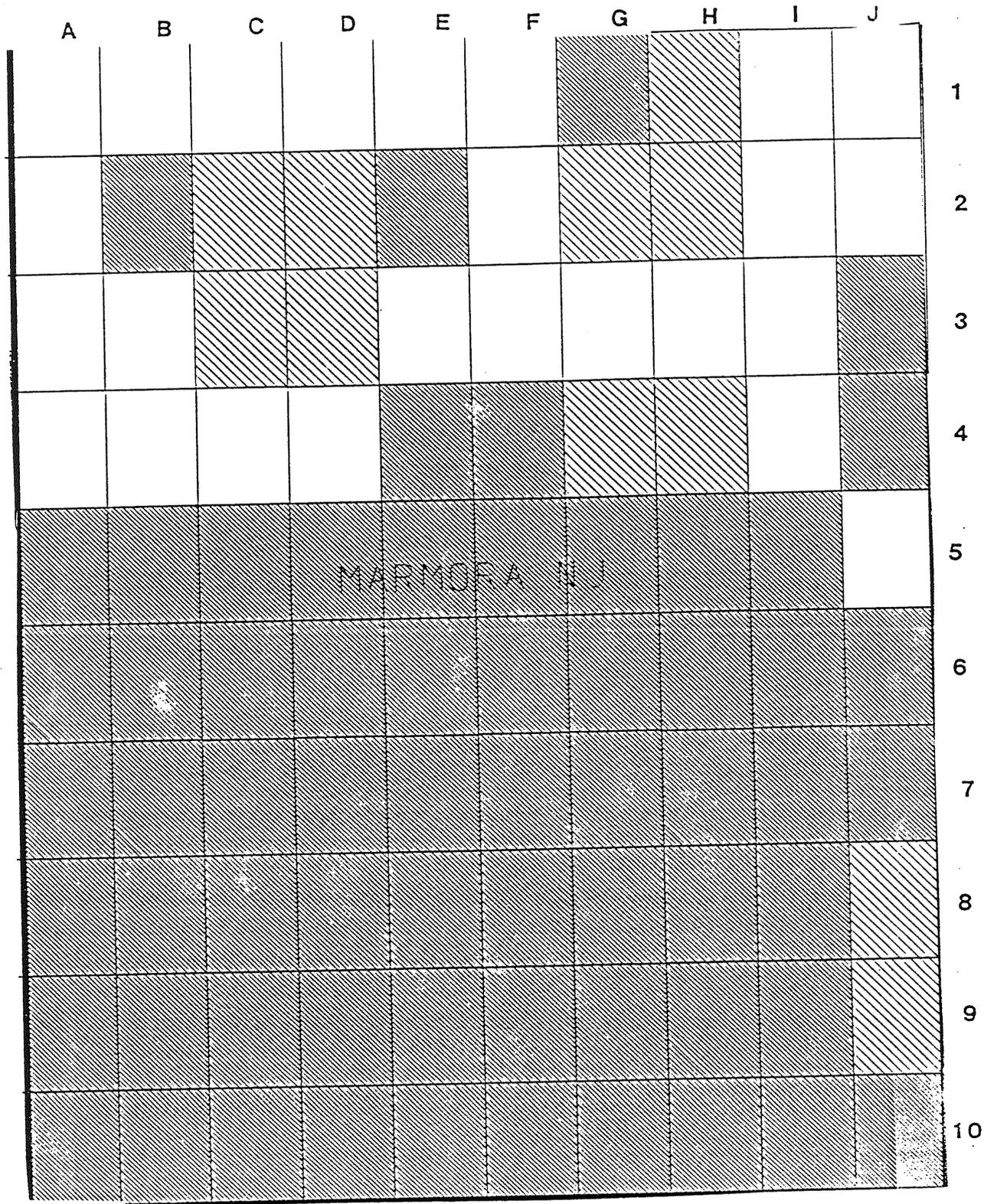
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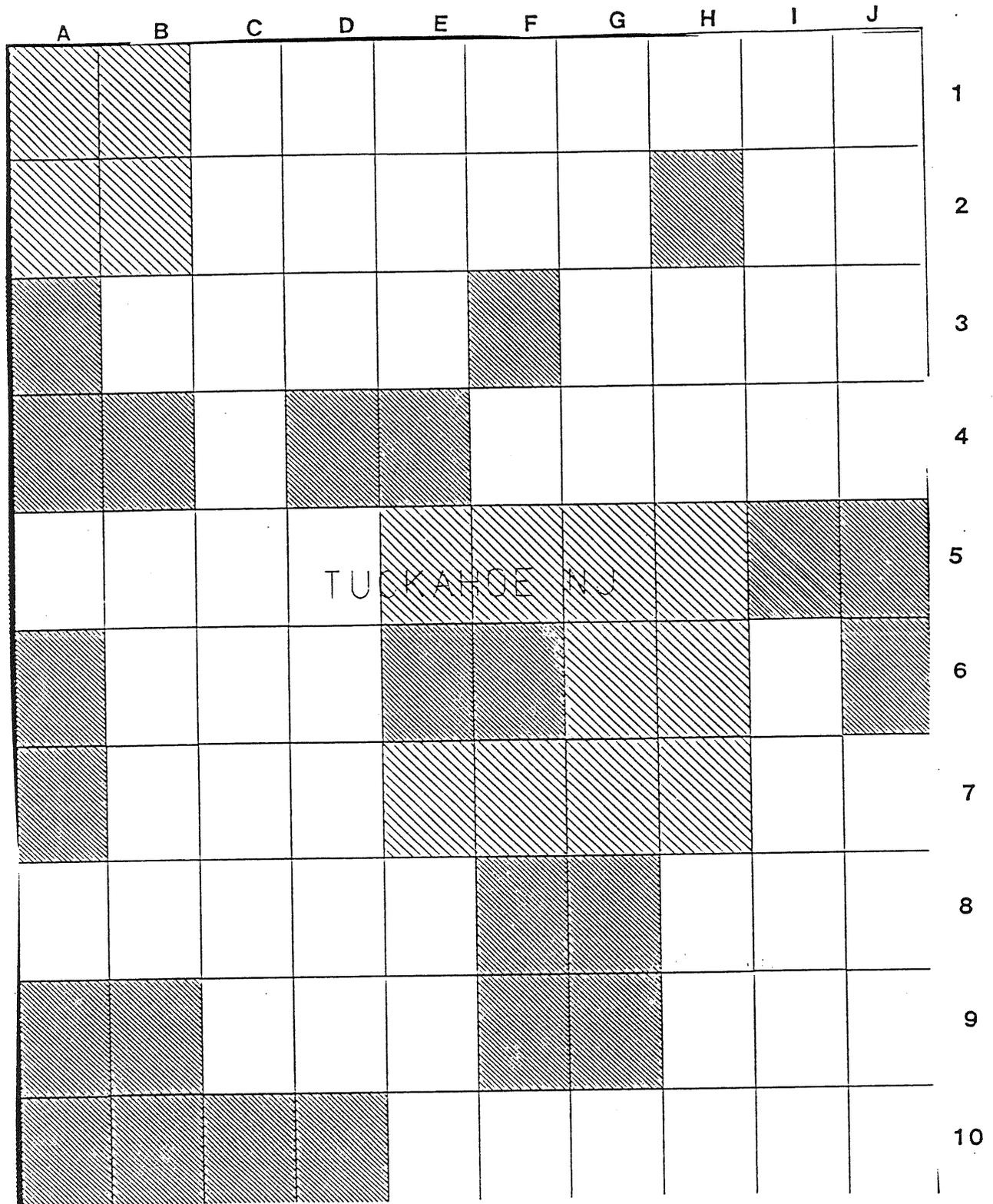
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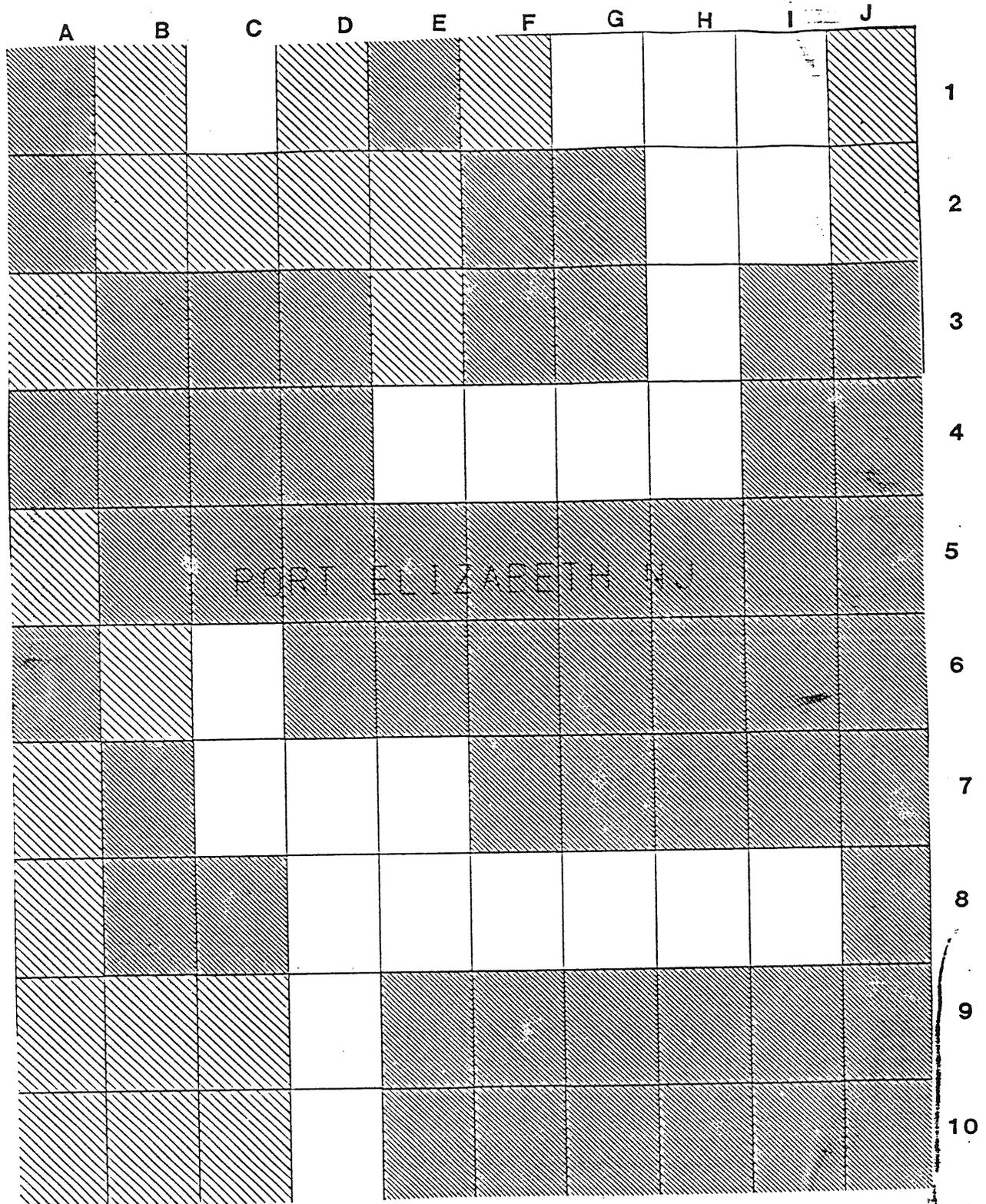
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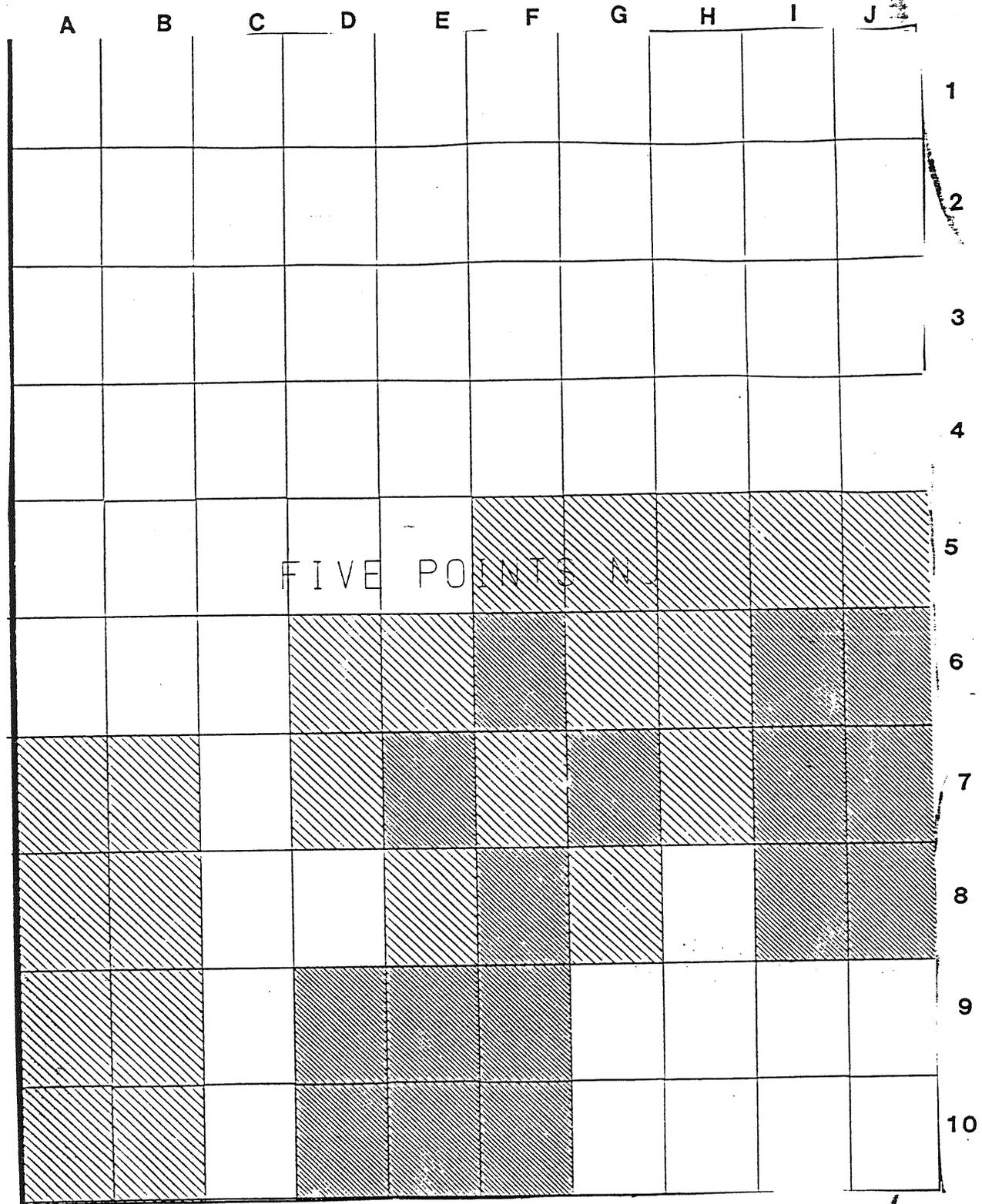
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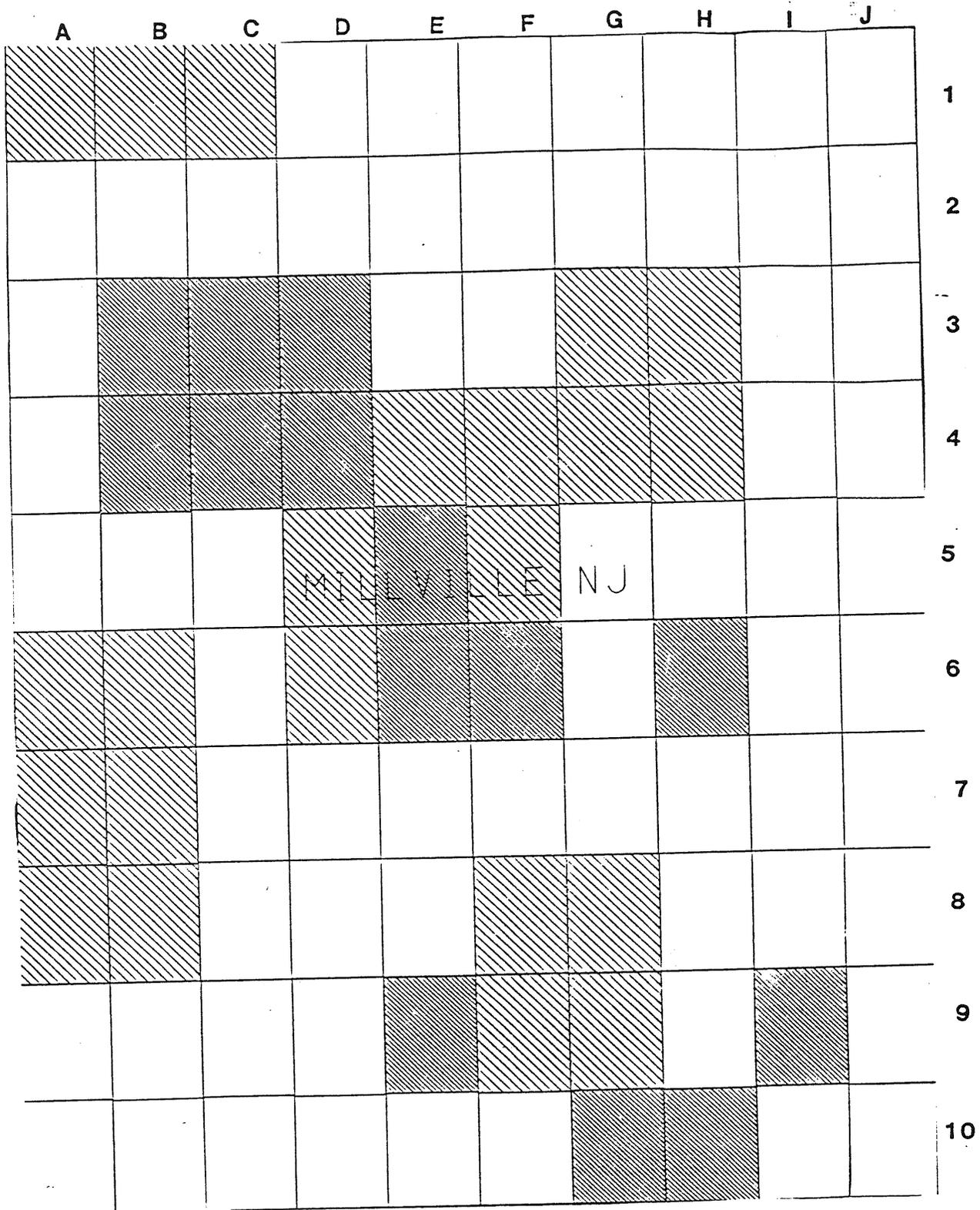
MAY 1988
UPDATED SEMIANNUALLY

NATURAL HERITAGE DATA

GENERALIZED LOCATIONS FOR RARE & ENDANGERED ELEMENTS OF NATURAL DIVERSITY

 DOCUMENTED LOCATION
 KNOWN PRECISELY

 DOCUMENTED LOCATION
 KNOWN WITHIN 1.5 MI.



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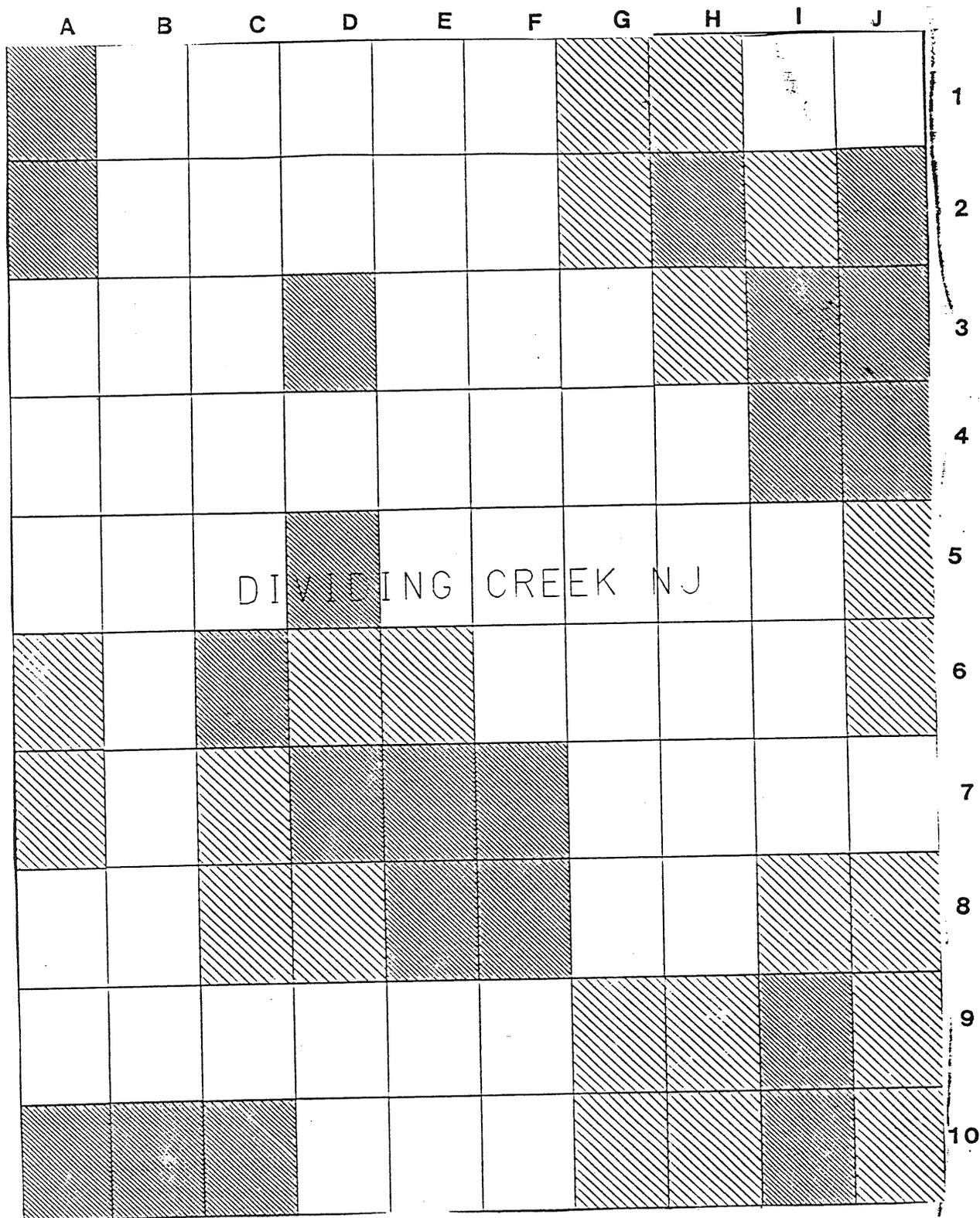
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MAY 1988

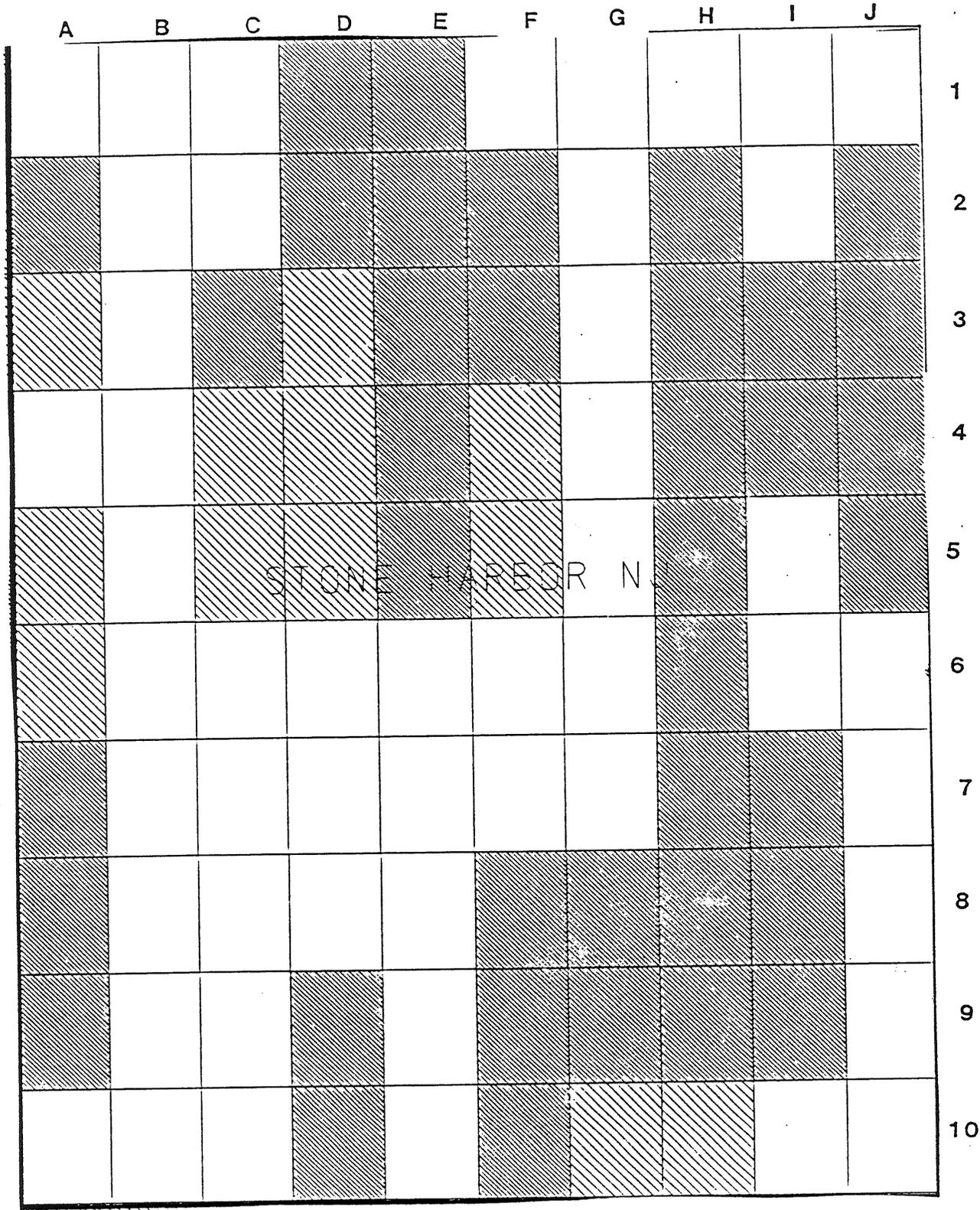
UPDATED SEMIANNUALLY

NATURAL HERITAGE DATA

GENERALIZED LOCATIONS FOR RARE & ENDANGERED ELEMENTS OF NATURAL DIVERSITY

 DOCUMENTED LOCATION
 KNOWN PRECISELY

 DOCUMENTED LOCATION
 KNOWN WITHIN 1.5 MI.



STONE HARBOR N.

NOTE: THIS IS NOT A COMPLETE MAP OF RARE AND ENDANGERED SPECIES HABITAT FOR THIS AREA. IT REFLECTS DATA ON KNOWN OCCURRENCES COMPILED AS OF THE ABOVE DATE. IT INCLUDES BOTH HISTORICALLY AND RECENTLY DOCUMENTED OCCURRENCES. ADDITIONAL OCCURRENCES MAY BE FOUND ON UNSURVEYED HABITAT. FOR MORE INFORMATION, CONTACT THE OFFICE OF NATURAL LANDS MANAGEMENT, CN-664, TRENTON NJ 08625.

MAY 1988

UPDATED SEMIANNUALLY

SUBSECTION II-E

Corridor Contamination Sites

NEW JERSEY DEPARTMENT OF TRANSPORTATION

M E M O R A N D U M

TO: Elkins Green

FROM: Robert Cebrick *RC*

SUBJECT: Route 55 Extension
Corridor Contamination Study
Cumberland & Cape May Counties

DATE: May 17, 1991

As requested, attached is the Corridor Contamination Study for the subject project.

If there are any questions relative to the content of the study, please contact Mathew Bahrami at 5-5361.

MB:aoc

attachment

**ROUTE 55 EXTENSION
CORRIDOR CONTAMINATION STUDY
CUMBERLAND AND CAPE MAY COUNTIES**

This study was conducted by the BEA's Hazardous Waste Group to identify environmental constraints within the Route 55 corridor. Areas of concern included: 1) superfund sites, 2) solid waste landfills/hazardous waste sites not classified as superfund, 3) known and suspected sites as identified by the New Jersey Department of environment protection (NJDEP) and 4) other sites which exhibited contamination characteristics during field investigations.

This study consisted of two subtasks, 1) a library research and 2) a field survey. Subtask one included a review of the following:

- A. National Priority List (NPL or Superfund) - The comprehensive Environmental Response, Compensation and Liability Act (CERCLA) commonly known as the Superfund, has been established by the USEPA in response to the dangers of uncontrolled or abandoned hazardous waste sites. Each of these catalogued sites is to be evaluated by EPA to determine whether any remedial action is actually required,
- B. Environment Information Inventory (EII) prepared by the NJDEP's Bureau of Solid Waste and Resource Recovery Planning. EII contains a compilation of two waste sites, 1) sanitary landfills, and 2) hazardous waste sites. The hazardous waste sites included in EII fall under two categories, 1) National Priority Sites, and 2) Interim Management Plan Sites, where cleanup is being pursued under the authority of the New Jersey Spill Compensation and Control Act.
- C. New Jersey Department of Environmental Protection's Compilation of Known and Suspected (K&S) sites prepared by the NJDEP's Division of Solid Waste Management. The K&S identified any sites which may or may not be covered by the NPL or EII but suspected of being contaminated and therefore may require major cleanup.

Excluded from this study were 1) reviews of environmental files maintained by the NJDEP and USEPA, and 2) a determination of potential applicability to the Environmental Cleanup Responsibility Act (ECRA) regulation for properties in the corridor area. The scope of this study did not allow for such reviews.

Project Description and Identification of Affected Properties

This project mainly explores the possibility of extending the existing Route 55 from the southern terminus in Cumberland County to the Garden State Parkway in Cape May. In addition to this alternative, improvements to existing Route 47/83 are to be investigated.

The results of the study are presented in items of USGS Quadrangle Sections. The location of each identified site is presented along with a brief description of the problem. Each site is given a number which corresponds to a location on the attached Quadrangle sheet.

Millville Quadrangle

NPL - No sites
EII - No sites
K&S - No sites

Five Points Quadrangle

NPL - No sites
EII - No sites
K&S - No sites

Dividing Creek Quadrangle

NPL - No sites
EII - NO sites
K&S - No sites

Port Elizabeth Quadrangle

NPL - No sites
EII - No sites
K&S - Site # 1 - Route 548, Maurice River Township.
An open pit with monitoring wells. Possibly
unregistered sanitary landfill.

Tuckahoe Quadrangle

NPL - No sites
EII - No sites
K&S - No sites

Marmora Quadrangle

NPL - No sites
EII - No sites
K&S - No sites

Meislerville Quadrangle

NPL - No sites
EII - No sites
K&S - No sites

Woodbine Quadrangle

NPL - No sites

EII - Site # 2 - Route 47, Dennis Township. J.M.C. Auto Salvage (G.J. Gibboni Corporation).

Site # 3 - Dennisville-Petersburg Road (Route 610), Upper Township and Woodbine Borough. Secure Sanitary Landfill, Cape May County Municipal Utility Authority.

Site # 4 - Kings Highway, South Seaville Avenue (Route 608), Dennis Township. Dennis Township Seaville Sanitary Landfill.

Site # 5 - Railroad Avenue, Dennis Township. Dennis Township Belleplaine Landfill.

Site # 6 - Belleplaine State Forest, Dennis Township. Belleplaine State Forest Sanitary Landfill.

Site # 7 - Calhune Street, Woodbine Borough. Attenbury's Sanitary Landfill.

Site # 8 - Fidler Hill Road, Woodbine Borough. Woodbine Sanitary Landfill

K&S - No sites

SEA Isle City Quadrangle

NPL - No sites

EII - No sites

K&S - No sites

Stone Harbor Quadrangle

NPL - No sites

EII - No sites

K&S - No sites

Remarks

Disruption of a sanitary landfill or an auto salvage yard would involve a major work effort requiring preparation of lengthy environmental studies. It is our recommendation that these sites be avoided. If this can not be done, a comprehensive site investigation of these facilities would have to be conducted by a qualified hazardous waste consultant. While BEA currently has limited information available concerning the identified facilities, based on our experiences with other similar facilities costs associated with the required studies would run from \$100,000 to \$500,000. Furthermore, the remediation costs could be expected to exceed several million dollars.

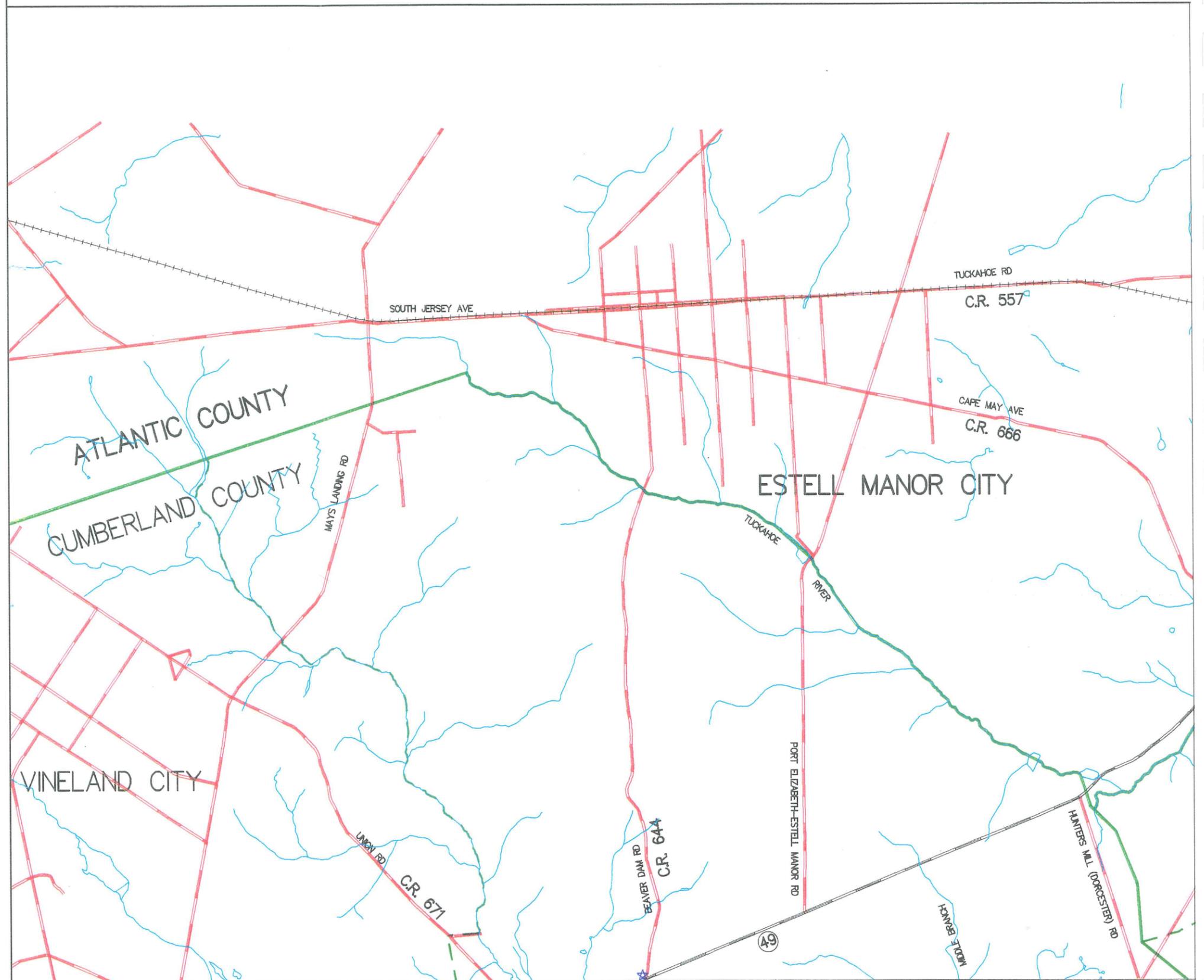
HISTORIC ARCHITECTURE

-  COUNTY BOUNDARY
-  CITY AND/OR TOWNSHIP BOUNDARY
-  PRIMARY ROADS
-  PRIMARY ROADS BEING CONSIDERED FOR ROUTE ALTERNATIVES
-  STREAMS, LAKES, PONDS
-  RAILROAD
-  OLD RAILROAD GRADE

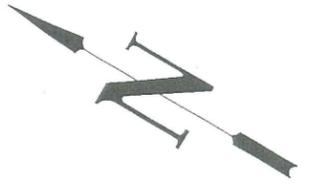
-  BUILDING OR STRUCTURE OF INTEREST IDENTIFIED BY NJDOT FIELD SURVEY
-  0106-L9 NJHPO SURVEY DESIGNATION - 9TH PROPERTY LISTED
-  NR NATIONAL REGISTER PROPERTY
-  0507-153 ON-SYSTEM BRIDGE WITH STRUCTURE NUMBER

-  NR NATIONAL REGISTER HISTORIC DISTRICT
-  BUILT-UP AREA NOT SURVEYED ON A BUILDING-BY-BUILDING BASIS

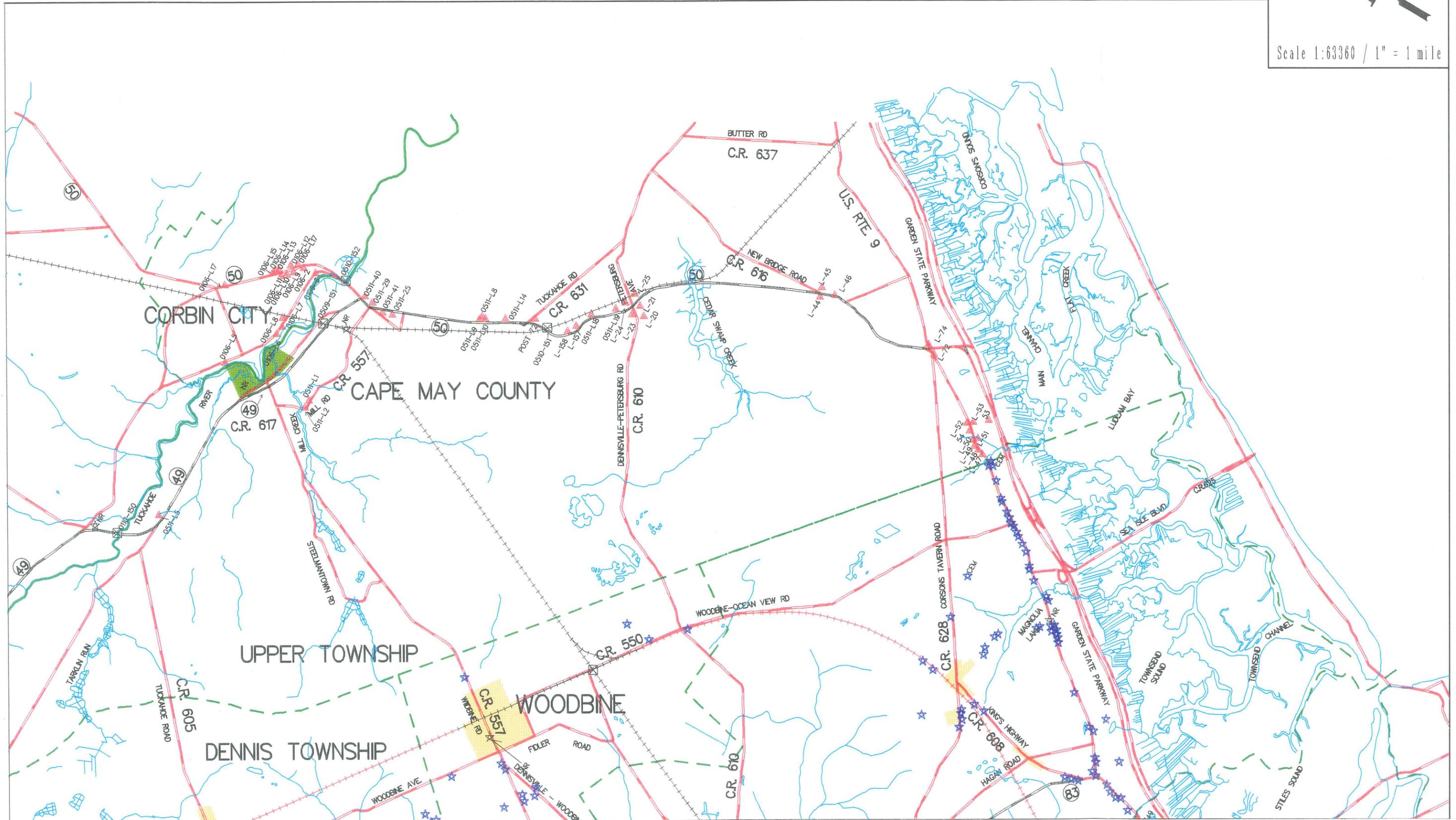
NOTE: BOUNDARIES OF INDIVIDUAL SITES HAVE NOT BEEN DETERMINED. HISTORIC BUILDINGS MAY HAVE ASSOCIATED ARCHAEOLOGICAL FEATURES.



ROUTE 55 EXTENSION STUDY ENVIRONMENTALLY SENSITIVE AREAS MAP



Scale 1:63360 / 1" = 1 mile



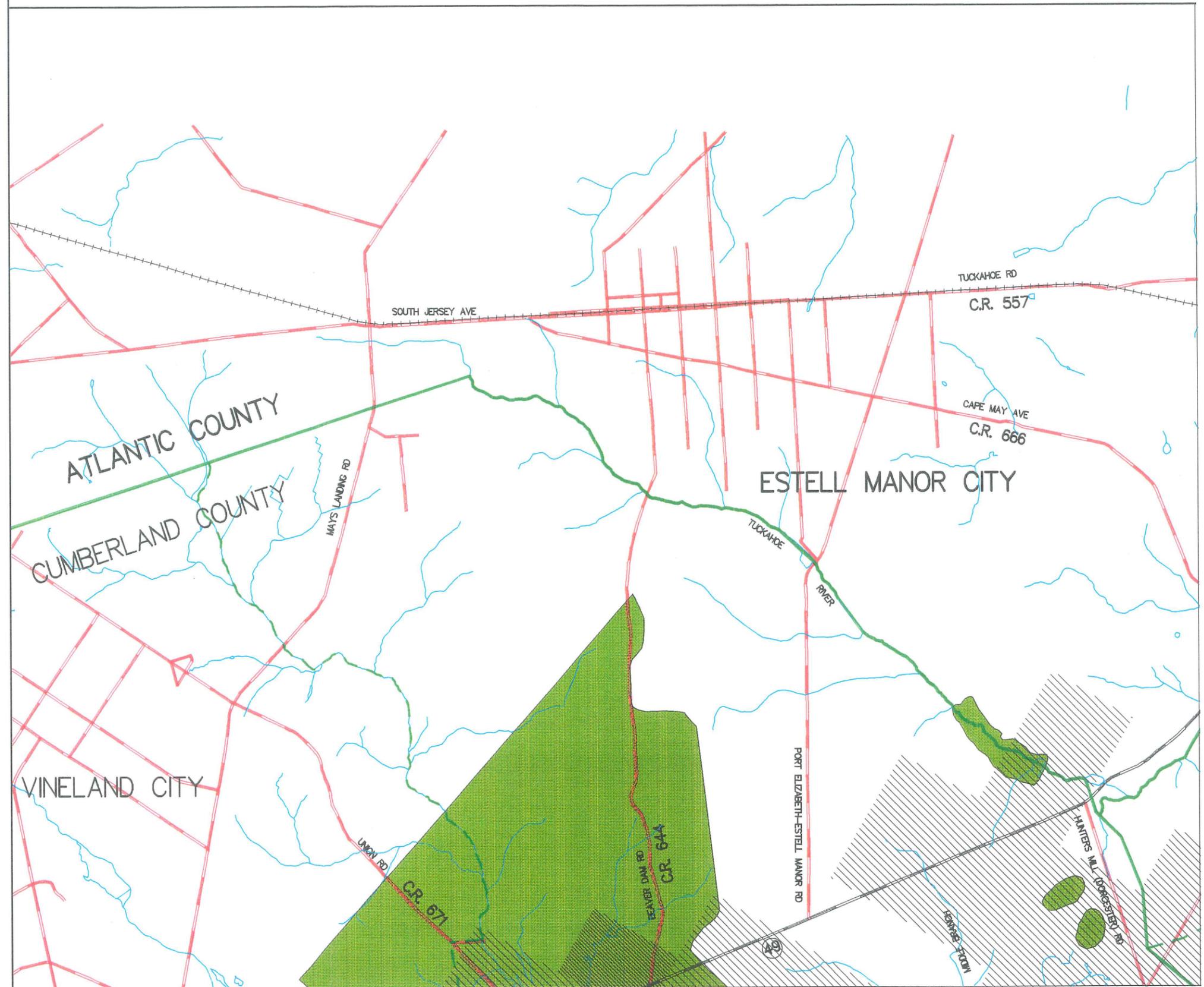
ENDANGERED SPECIES

-  COUNTY BOUNDARY
-  CITY AND/OR TOWNSHIP BOUNDARY
-  PRIMARY ROADS
-  PRIMARY ROADS BEING CONSIDERED FOR ROUTE ALTERNATIVES
-  STREAMS, LAKES, PONDS
-  RAILROAD
-  OLD RAILROAD GRADE

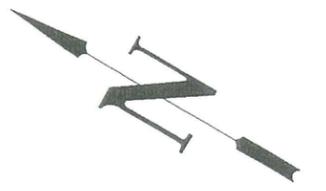
 NATURAL HERITAGE PRIORITY SITE FOR THE PRESERVATION OF BIOLOGICAL DIVERSITY

 DOCUMENTED LOCATION OF A THREATENED OR ENDANGERED SPECIES IS KNOWN PRECISELY

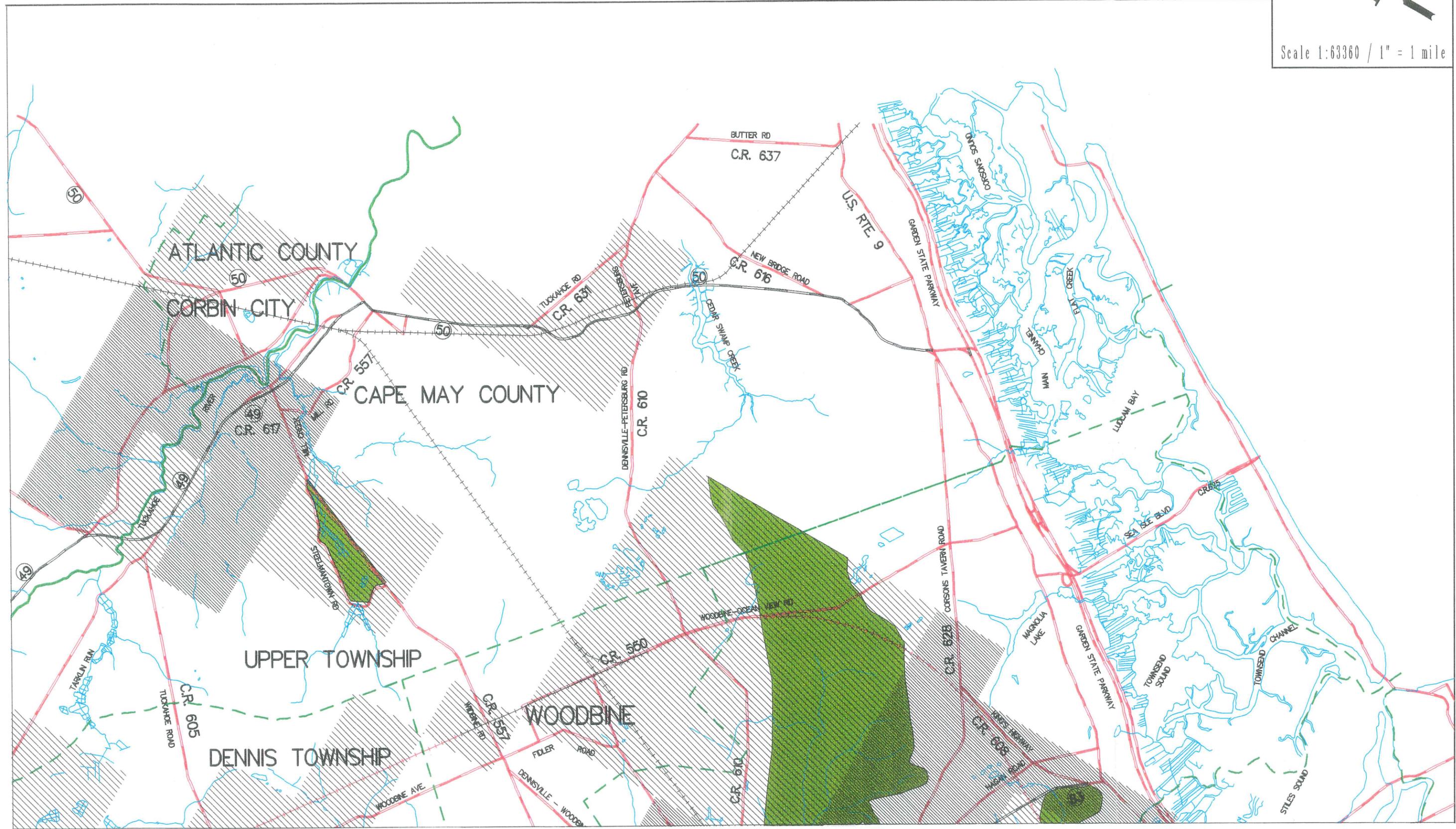
 DOCUMENTED LOCATION OF A THREATENED OR ENDANGERED SPECIES IS KNOWN WITHIN 1.5 MI...

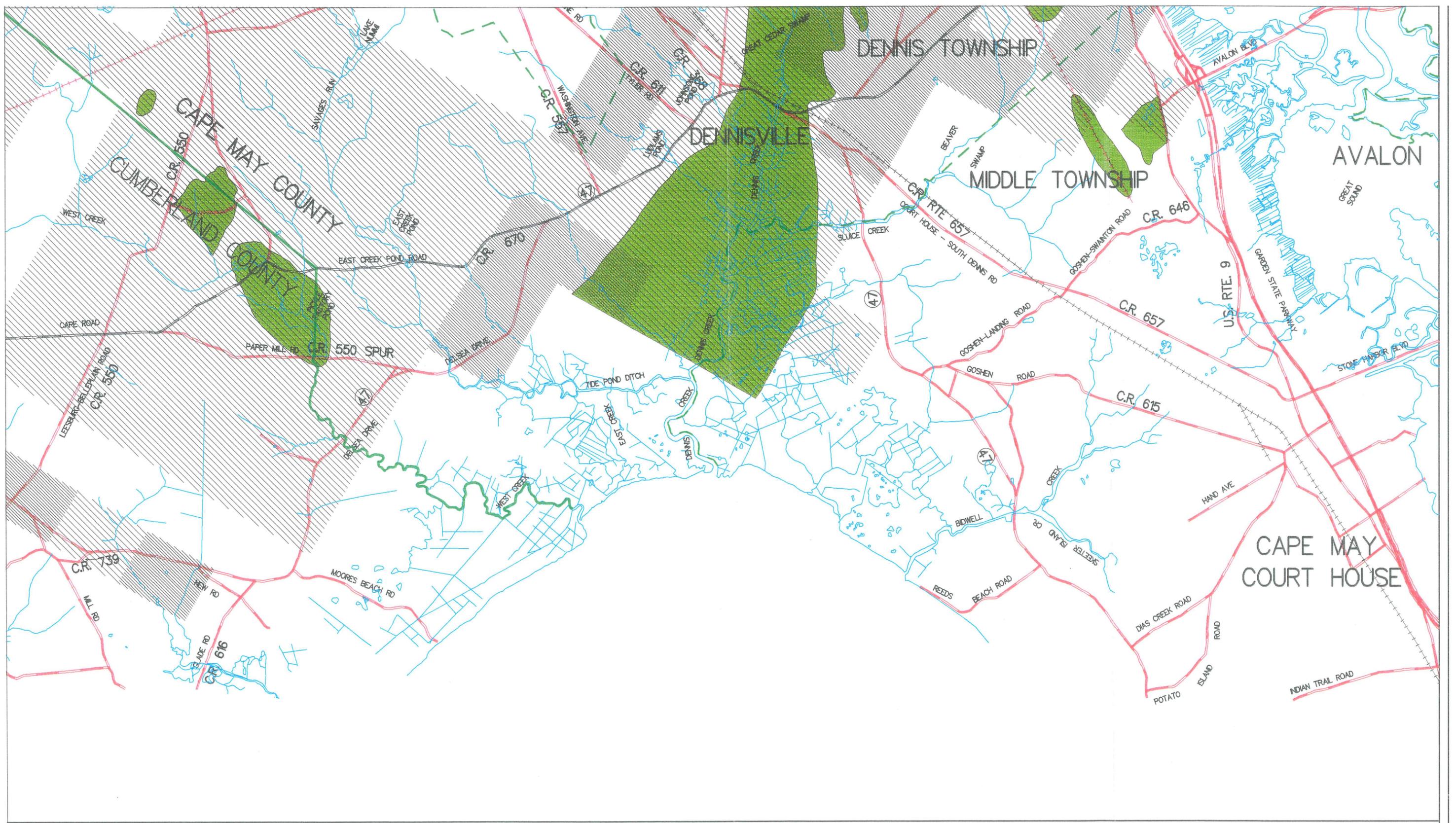


ROUTE 55 EXTENSION STUDY ENVIRONMENTALLY SENSITIVE AREAS MAP



Scale 1:63360 / 1" = 1 mile



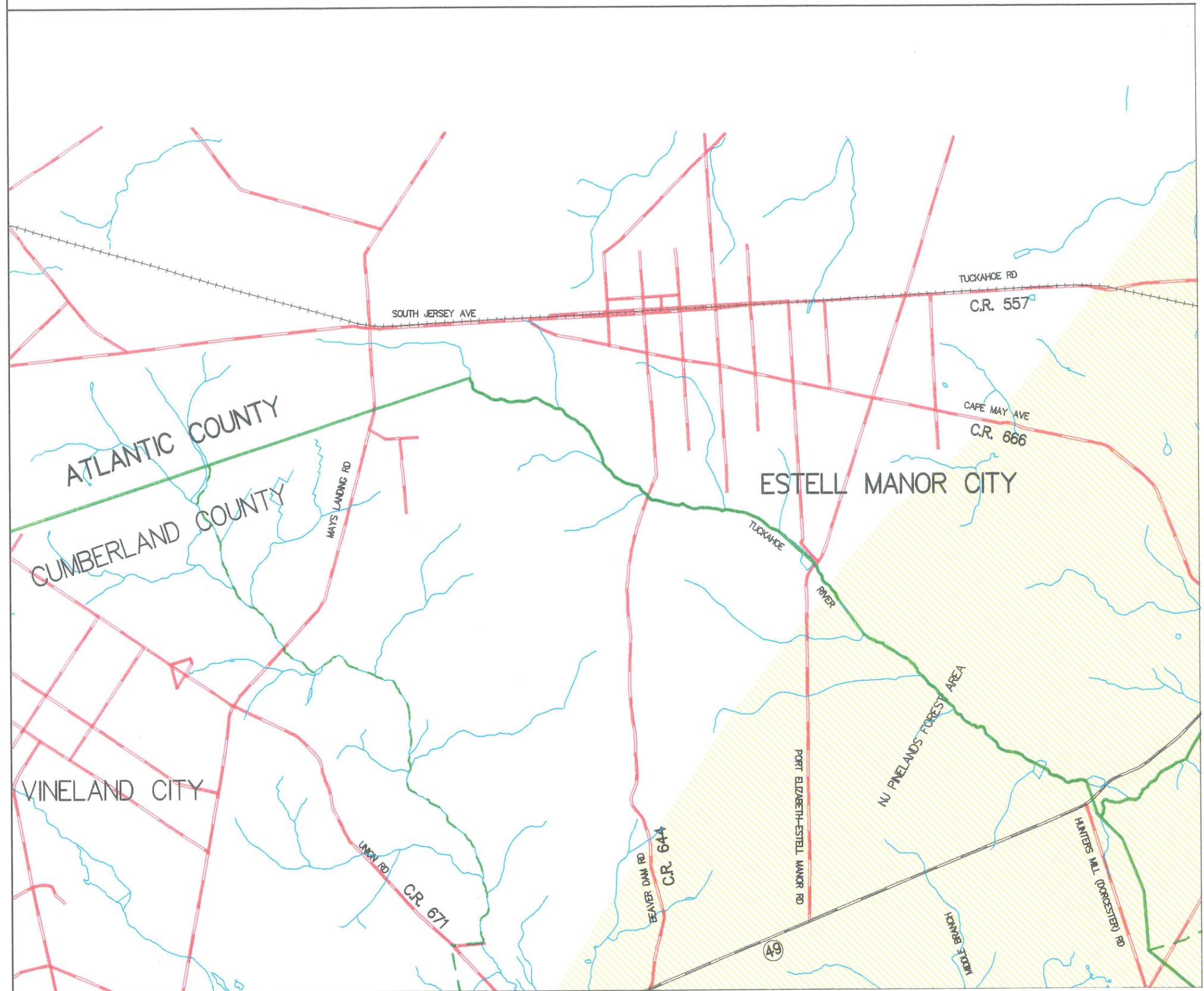


ROUTE 55 EXTENSION STUDY
ENVIRONMENTALLY SENSITIVE AREAS MAP

CAFRA AND PINELANDS

-  COUNTY BOUNDARY
-  CITY AND/OR TOWNSHIP BOUNDARY
-  PRIMARY ROADS
-  PRIMARY ROADS BEING CONSIDERED FOR ROUTE ALTERNATIVES
-  STREAMS, LAKES, PONDS
-  RAILROAD
-  OLD RAILROAD GRADE
-  NJ PINELANDS - RURAL DEVELOPMENT AREA
-  NJ PINELANDS - WILD AND SCENIC CORRIDOR
-  NJ PINELANDS VILLAGE

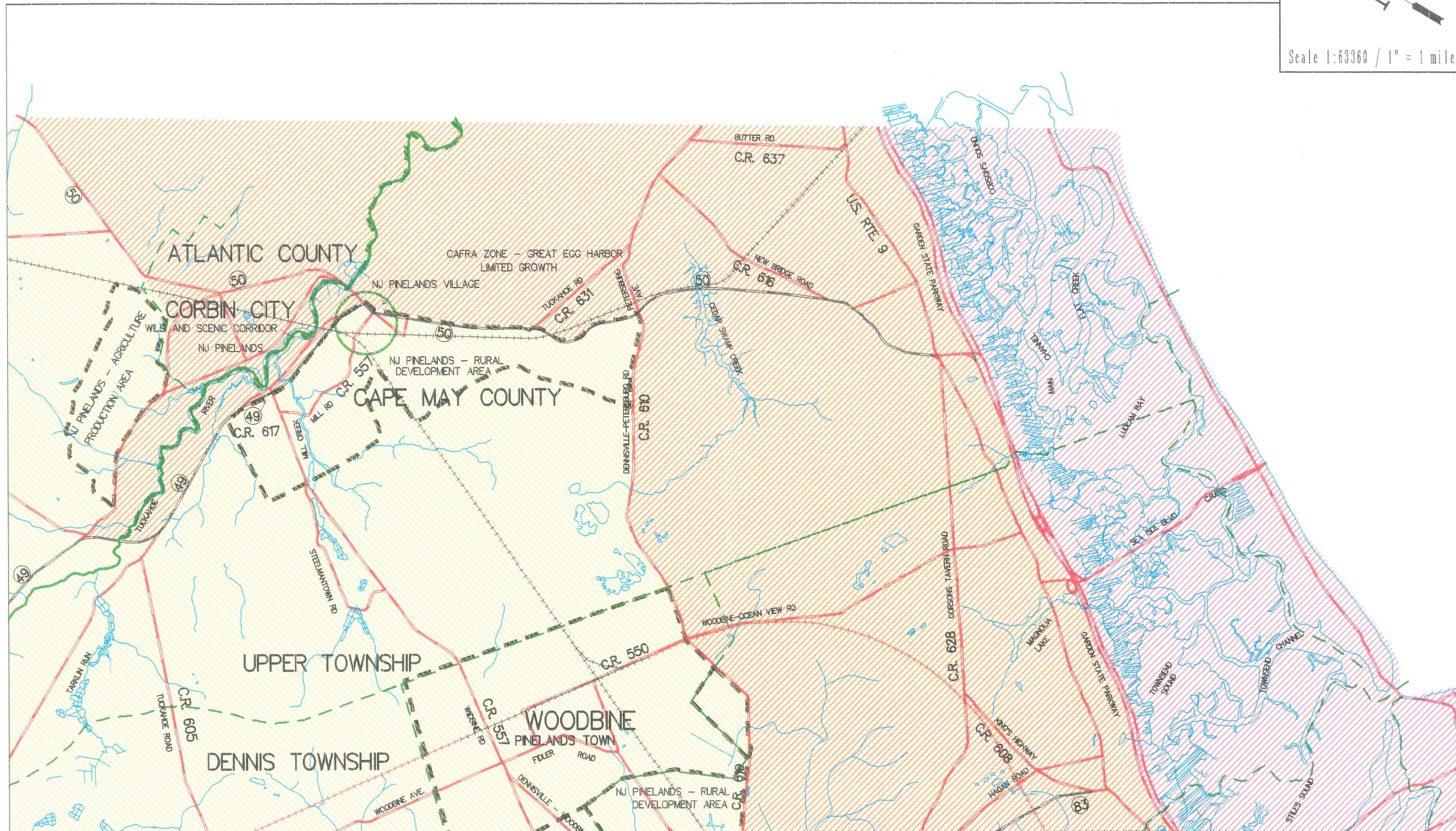
-  CAFRA ZONE
-  NJ PINELANDS
-  OVERLAP OF CAFRA ZONE AND NATIONAL PINELANDS RESERVE



ROUTE 55 EXTENSION STUDY ENVIRONMENTALLY SENSITIVE AREAS MAP



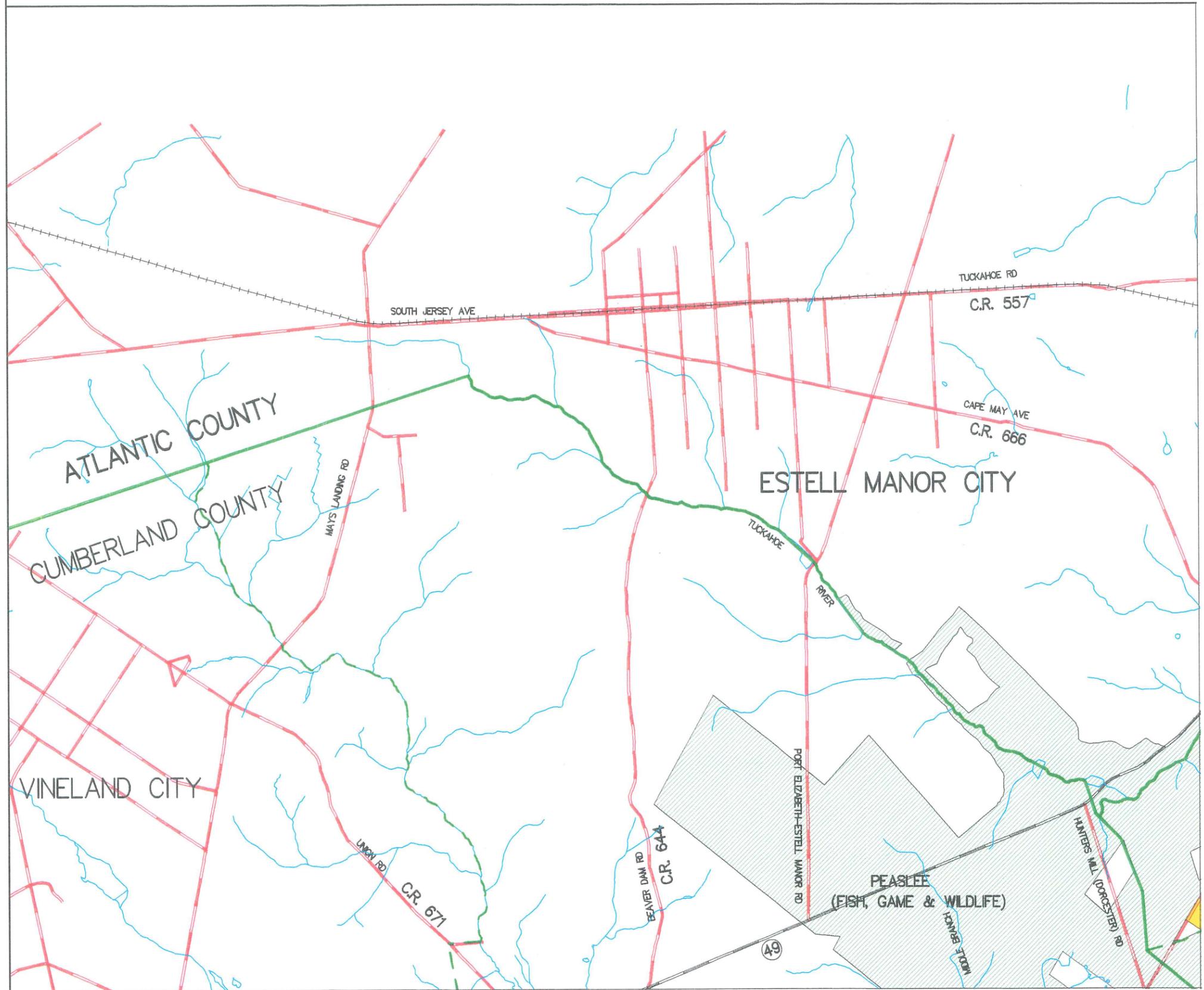
Scale 1:63360 / 1" = 1 mile

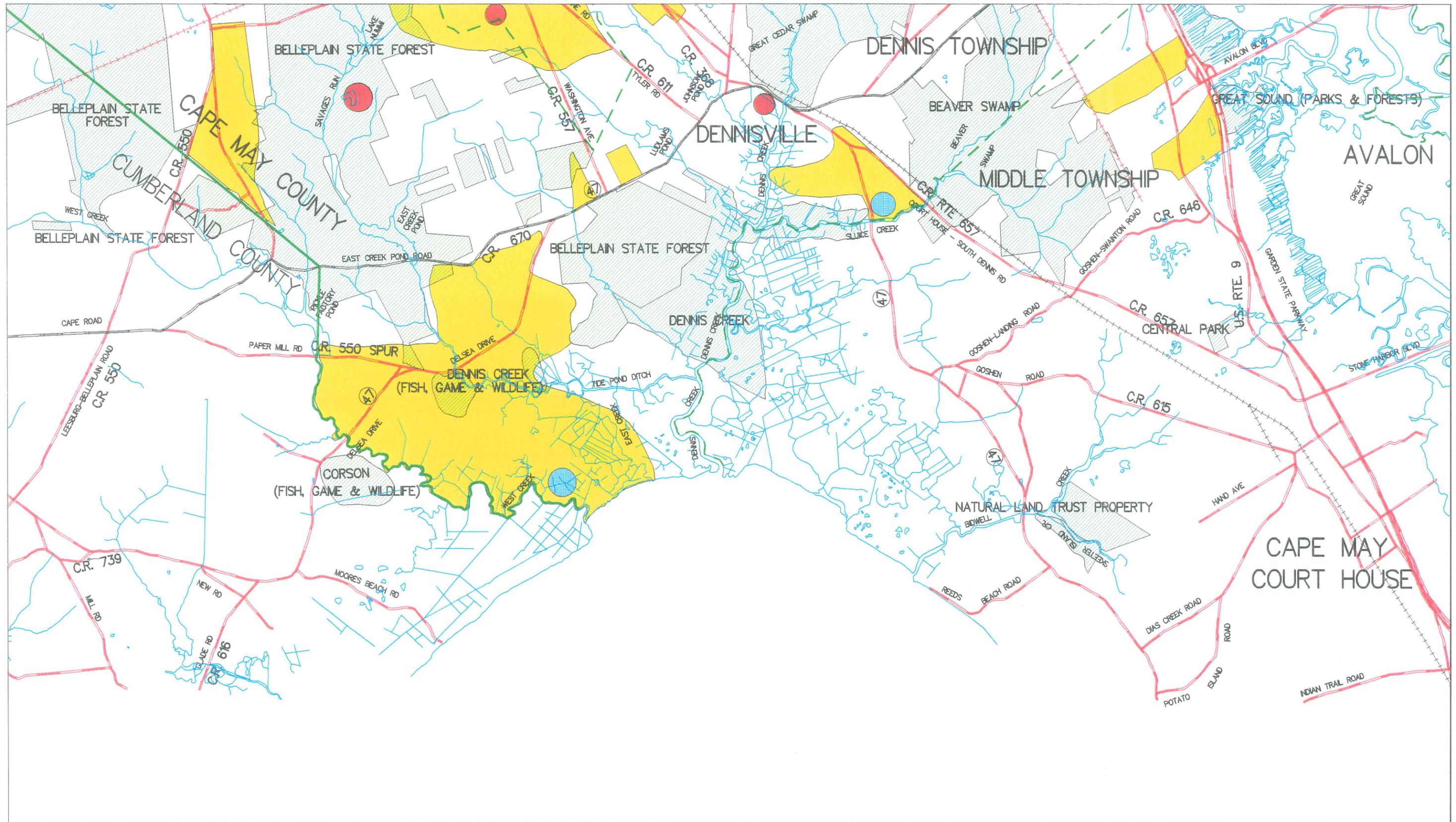


PARKS, FORESTS AND GAME LANDS

- COUNTY BOUNDARY
- CITY AND/OR TOWNSHIP BOUNDARY
- PRIMARY ROADS
- PRIMARY ROADS BEING CONSIDERED FOR ROUTE ALTERNATIVES
- STREAMS, LAKES, PONDS
- RAILROAD
- OLD RAILROAD GRADE

- COUNTY AGRICULTURE DEVELOPMENT AREAS (ADA's)
- PARKS, FOREST, GAMELANDS
- PROPOSED DEVELOPMENT SINGLE FAMILY UNITS
- FARMSTEADS ENROLLED IN 8 YEAR PRESERVATION PROGRAM
- AREAS DESIGNATED AS HIGH FOR POTENTIAL CONTAMINATION
- PARKS, FORESTS, GAMELANDS, AND PROPOSED DEVELOPMENT SINGLE FAMILY UNITS
- PARKS, FORESTS, GAMELANDS, AND COUNTY AGRICULTURE DEVELOPMENT AREAS



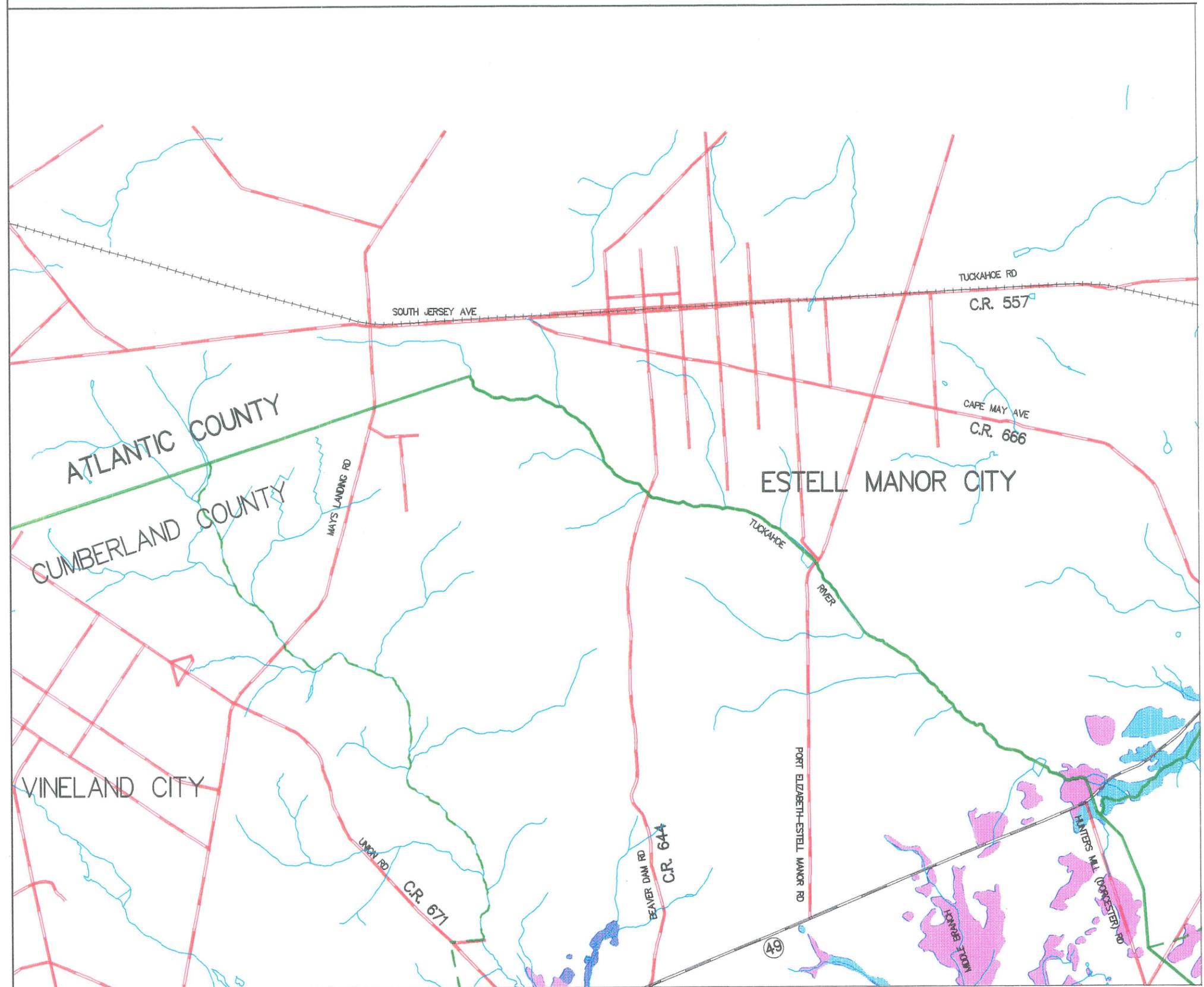


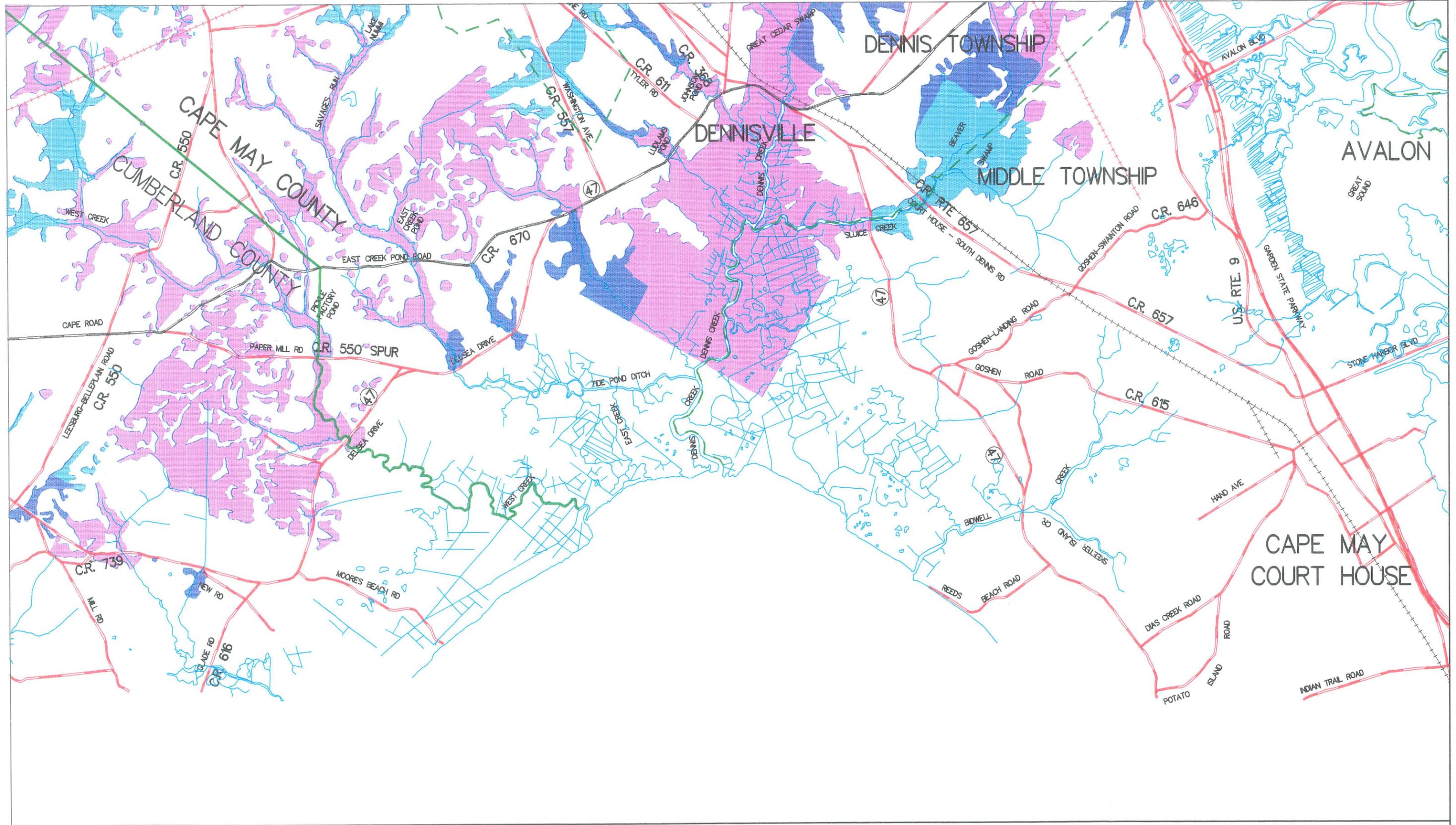
ROUTE 55 EXTENSION STUDY
ENVIRONMENTALLY SENSITIVE AREAS MAP

WETLAND EMPHASIS

-  COUNTY BOUNDARY
-  CITY AND/OR TOWNSHIP BOUNDARY
-  PRIMARY ROADS
-  PRIMARY ROADS BEING CONSIDERED FOR ROUTE ALTERNATIVES
-  STREAMS, LAKES, PONDS
-  RAILROAD
-  OLD RAILROAD GRADE

-  HIGH QUALITY WETLAND
There is a very large possibility that a threatened or endangered species is associated with these wetlands.
-  MEDIUM QUALITY WETLAND
There is a possibility that a threatened or endangered species is associated with these wetlands.
-  AVERAGE QUALITY WETLANDS
There is little possibility that a threatened or endangered species is associated with these wetlands.

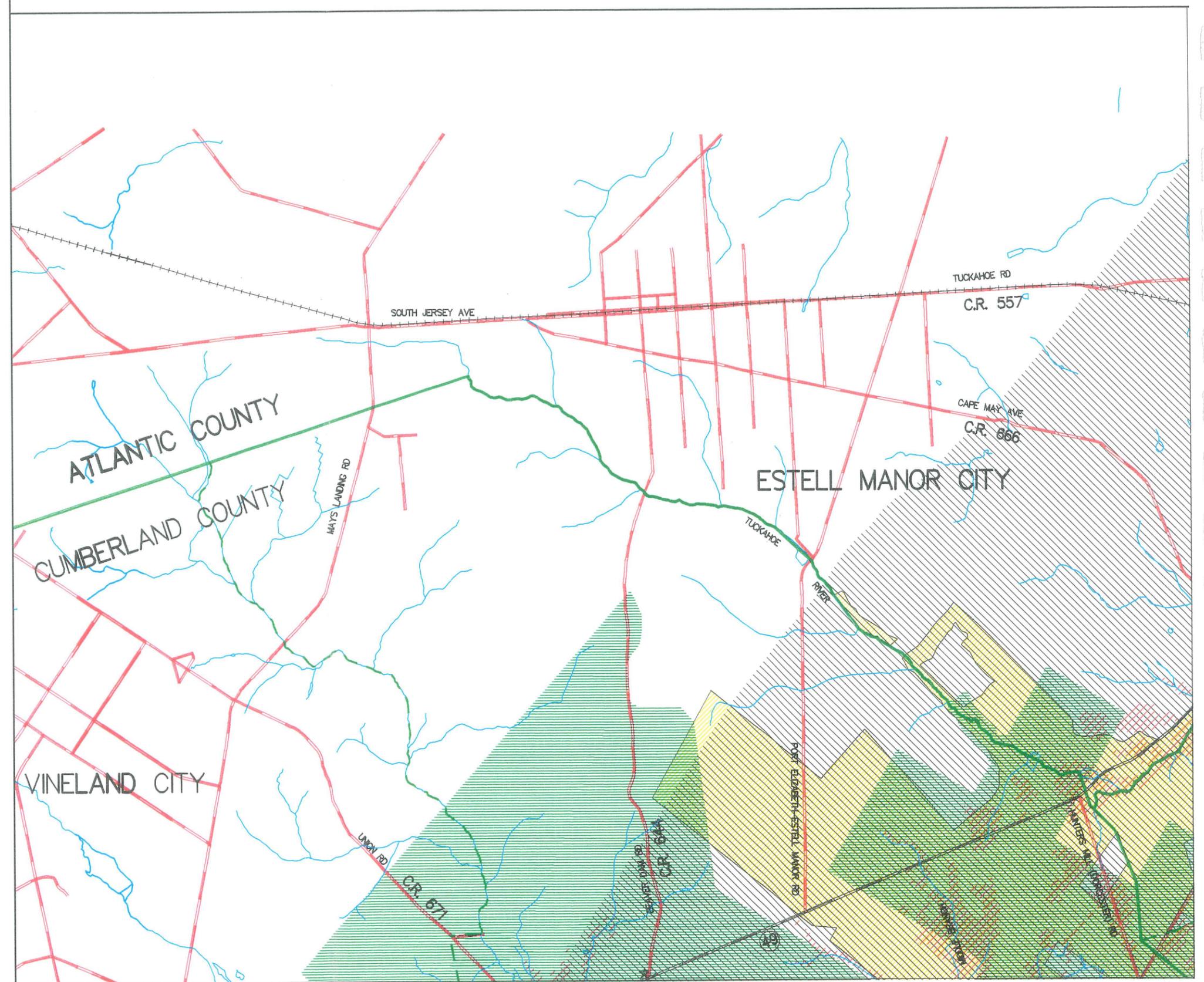




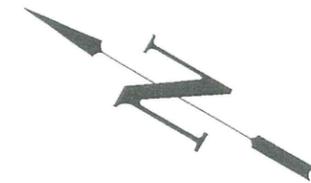
ROUTE 55 EXTENSION STUDY
ENVIRONMENTALLY SENSITIVE AREAS MAP

COMPOSITE OVERLAY

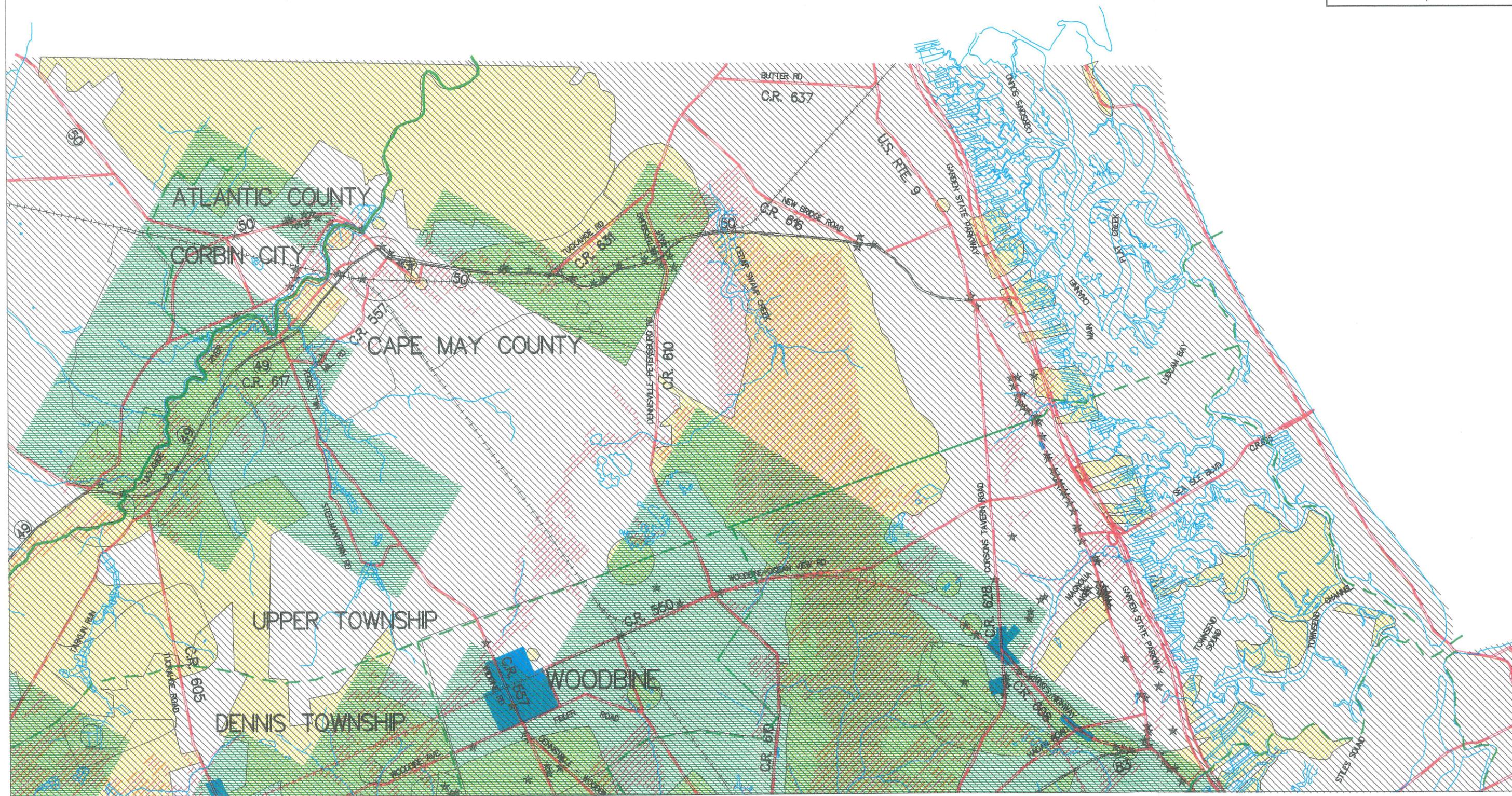
-  COUNTY BOUNDARY
-  CITY AND/OR TOWNSHIP BOUNDARY
-  PRIMARY ROADS
-  PRIMARY ROADS BEING CONSIDERED FOR ROUTE ALTERNATIVES
-  STREAMS, LAKES, PONDS
-  RAILROAD
-  OLD RAILROAD GRADE
-  ARCHITECTURAL POINT OF INTEREST
-  PARKS
-  WETLANDS
-  CAFRA AND PINELANDS
-  ENDANGERED SPECIES KNOWN & APPROXIMATELY KNOWN LOCATIONS
-  ARCHITECTURAL POINTS OF INTEREST

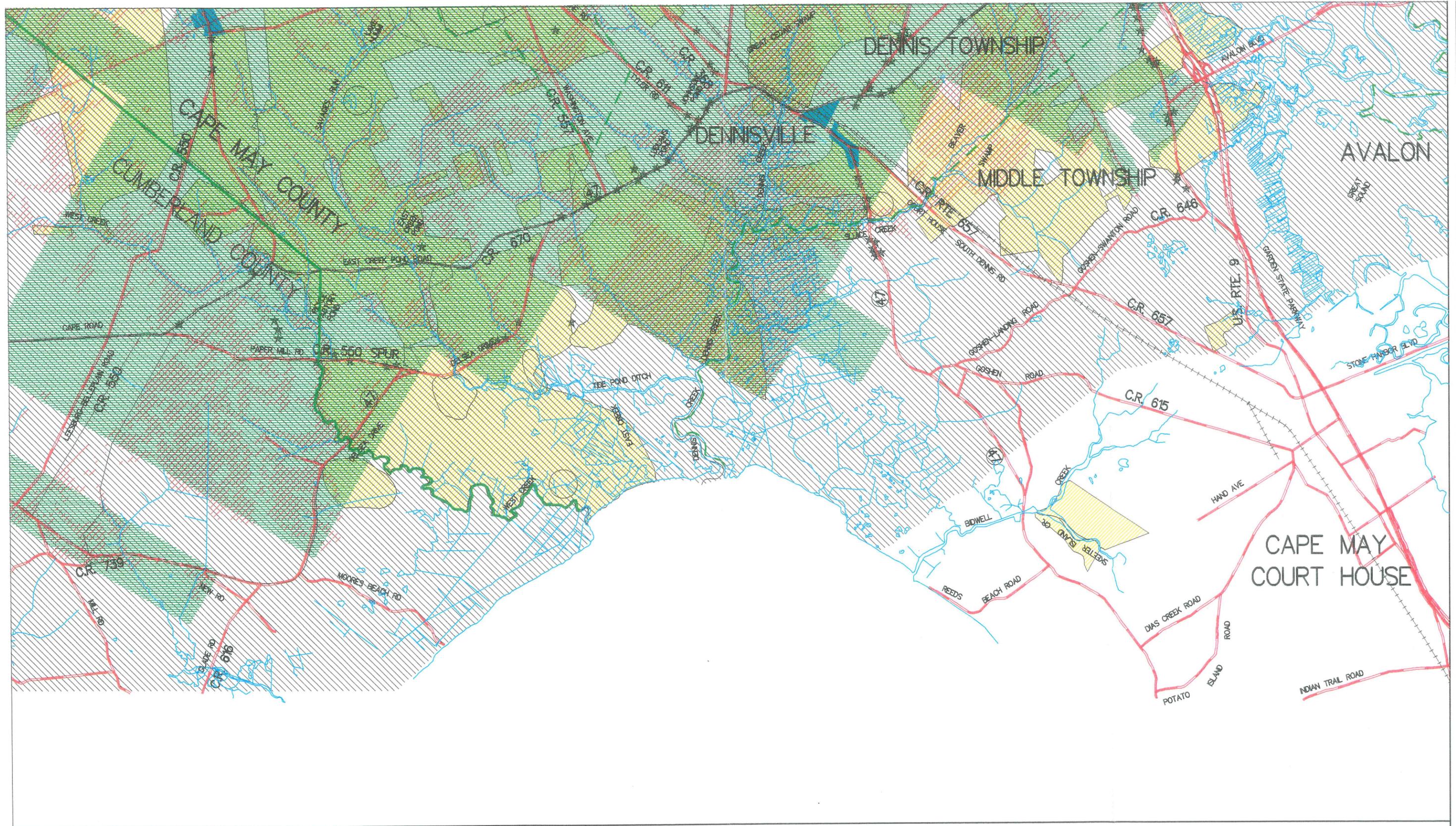


ROUTE 55 EXTENSION STUDY ENVIRONMENTALLY SENSITIVE AREAS MAP



Scale 1:63360 / 1" = 1 mile





ROUTE 55 EXTENSION STUDY
ENVIRONMENTALLY SENSITIVE AREAS MAP