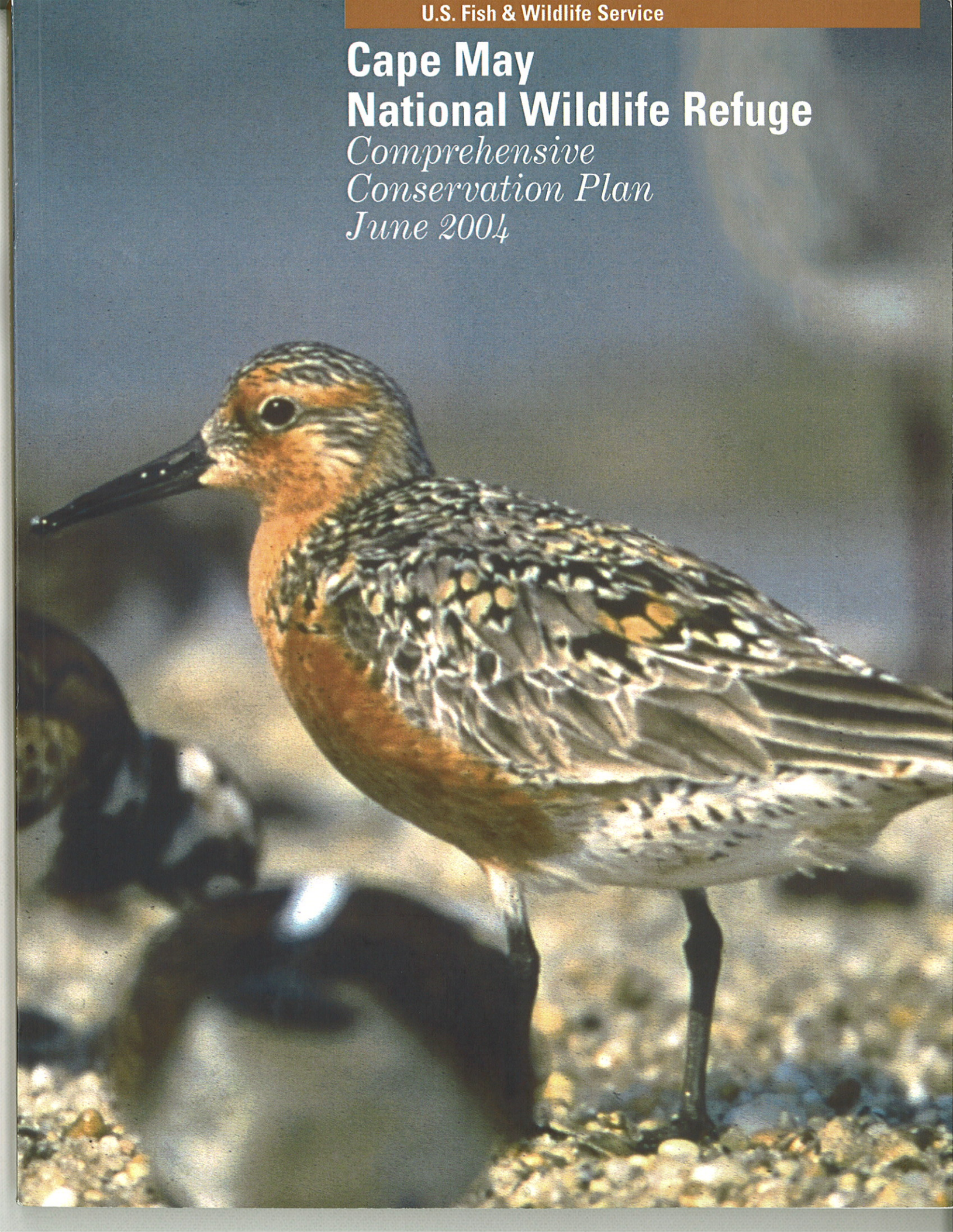
U.S. Fish & Wildlife Service

Cape May National Wildlife Refuge

Comprehensive Conservation Plan

June 2004



Cape May National Wildlife Refuge

Comprehensive Conservation Plan

June 2004

Prepared by
U.S. Fish and Wildlife Service
Region 5

Division of Planning
300 Westgate Center Drive
Hadley, MA 01035

Cape May National Wildlife Refuge
24 Kimbles Beach Road
Cape May Court House, NJ 08210

Approved : _____ **Date:** 6/18/04
Regional Director, Region 5

Implementation of this Comprehensive Conservation Plan and its management actions and programs have been assessed consistent with requirements of the National Environmental Policy Act (42 U.S.C. 4321 et seq.). The Finding of No Significant Impact (FONSI) was signed by Regional Director Mamie Parker on September 30, 2002. Director Steve Williams approved the Land Protection Plan on September 26, 2002. This final printing signifies completion of the administrative record for Cape May National Wildlife Refuge Comprehensive Conservation Plan.

Cape May National Wildlife Refuge
Comprehensive Conservation Plan Approval
U.S. Fish and Wildlife Service, Region 5

Submitted by:

Howard Schlegel
Refuge Manager
Cape May National Wildlife Refuge

June 8, 2004
Date

Concur:

Dick Dyer
Refuge Supervisor

June 10, 2004
Date

Anthony D. Leger
Regional Chief
National Wildlife Refuge System

June 14, 2004
Date

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Chapter 1. Introduction and Background

The Purpose of and Need for Action

Development of a Comprehensive Conservation Plan (CCP) is vital to the future management of Cape May National Wildlife Refuge (Cape May Refuge) and it's new Two Mile Beach Unit. The purpose of the CCP is to provide strategic management direction over the next 15 years by:

- Providing a clear statement of desired future conditions for habitat, wildlife, visitor services, and facilities;
- Providing a clear understanding of the reasons for management actions;
- Ensuring Refuge management reflects the policies and goals of the National Wildlife Refuge System (Refuge System) and our other legal mandates;
- Ensuring the compatibility of current and future public use;

e. Providing long-term continuity and direction for Refuge management;

f. Providing direction for staffing, operations, maintenance, and the development of budget requests.

The need to develop a CCP is two-fold. First, the National Wildlife Refuge System Improvement Act of 1997 (Refuge Improvement Act) requires that all National Wildlife Refuges have a CCP in place within 15 years to help fulfill the new mission of the Refuge System.

Second, there is currently no master plan establishing priorities and ensuring consistent and integrated management for Cape May Refuge. A vision statement and goals, objectives, and management strategies are needed to effectively manage natural resources. Persistent issues related to non-wildlife dependent public use, beach access, wilderness management, and management for threatened and endangered species must be resolved with public and partner involvement.

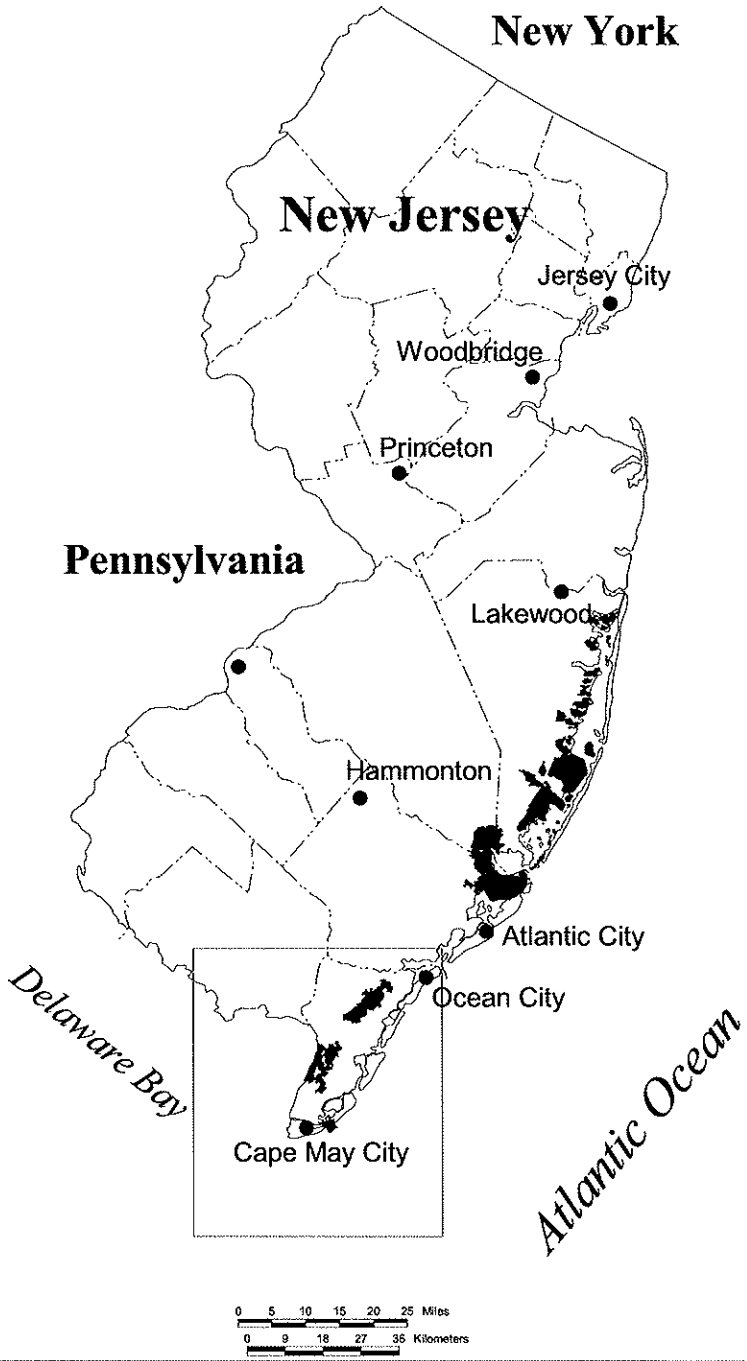
Cape May Refuge

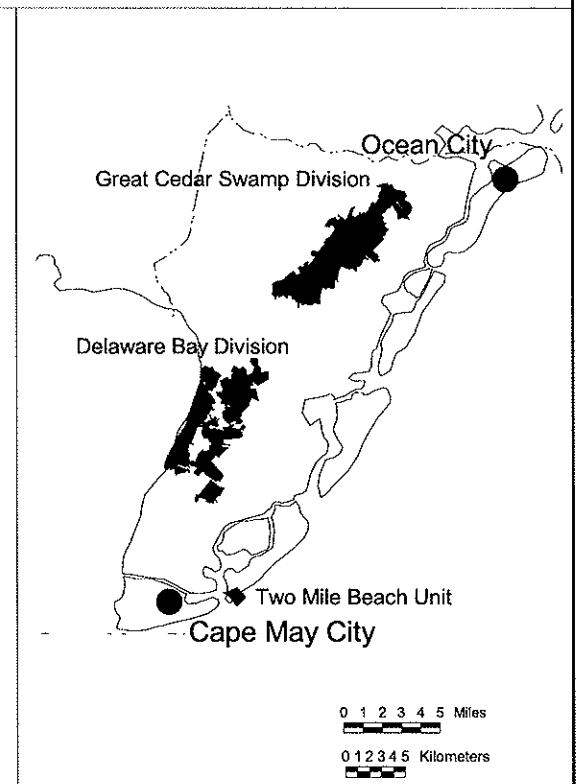
Cape May Refuge is located in Cape May County, and includes the Delaware Bay Division, the Great Cedar Swamp Division, and the Two Mile Beach Unit. (See Map 1.) The Refuge was established in 1989. The approved acquisition boundary for the Refuge encompasses 21,200 acres. As of September 26, 2002, the Service owned 11,025 acres within the approved Refuge acquisition area.

In the past seven years, several studies or plans that involved the vicinity of the Refuge have been initiated or completed. These studies demonstrate the importance of this area. The Refuge acquisition area is within the New Jersey Coastal Area Facilities Review Act (CAFRA) zone and within the Service's Twin Capes Project area (Cape May, NJ and Cape Charles, VA). It is partially within the Pinelands National Reserve, the Great Egg Harbor National Scenic and Recreational River, and the Cape May Migratory Bird Stopover Project. Delaware Bay wetlands within the Refuge are designated as Wetlands of International Importance under the Ramsar Convention. There are only 17 designated Wetlands of International Importance in the United States.

Map 1

Cape May National Wildlife Refuge





Data Sources:
USGS 1:100,000 counties.
USFWS refuge boundaries.

Map prepared for Jersey Coast Refuges Comprehensive Conservation Plan, January 2001.
This map is for planning purposes only

Shading represents both owned land and areas approved for acquisition.

N

Two Mile Beach Unit

The United States Coast Guard declared a major portion of its Electronic Engineering Center (EECEN) in Lower Township, Cape May County, excess to its needs in 1997. (See Map 2.) The northernmost 490 acres of the former EECEN were transferred from the Coast Guard to the Service on October 22, 1999 as the Two Mile Beach Unit of Cape May Refuge under the Transfer of Certain Real Property for Wildlife Conservation Purposes Act. Of the 490 acres, 221 acres are above mean high tide. Of these 221 acres, 90 acres are upland habitat and 131 acres are wetland habitat. The Coast Guard retained the remaining 530 acres of the former EECEN for its Long Range Aid to Navigation (LORAN) Support Unit (LSU) and the north dune antenna tower. The LSU will remain in operation indefinitely.

The eighteen acre parcel of land bounded by LSU along the southern boundary line, Ocean Drive along the northeastern boundary line and the Cape May Inlet along the western boundary line was purchased in August 2003 and added to the Cape May Refuge as part of the Two Mile Beach Unit. The entire property is considered wetland habitat.

Purposes of Cape May Refuge

Lands within the Refuge System are acquired and managed under a variety of authorities. These authorities usually have one or more purposes for which land can be transferred or acquired. Appendix A lists the authorities for acquisition and management of National Wildlife Refuges.

The purposes of Cape May Refuge are:

- "...use as an inviolate sanctuary, or for any other management purpose, for migratory birds...." The Migratory Bird Conservation Act (16 U.S.C. §715d);

- "...the development, advancement, management, conservation, and protection of fish and wildlife resources...." The Fish and Wildlife Act of 1956 (16 U.S.C. §742f(a)(4);

- "...the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations(regarding migratory birds)... " The Emergency Wetlands Resources Act of 1986 (16 U.S.C. §3901(b), 100 Stat. 3583).

The purpose of Cape May Refuge's Two Mile Beach Unit is:

- "...particular value in carrying out the national migratory bird management program" The Transfer of Certain Real Property for Wildlife Conservation Purposes Act, 1972, as amended (16 U.S.C. §667b-667d; 62 Stat. 240).

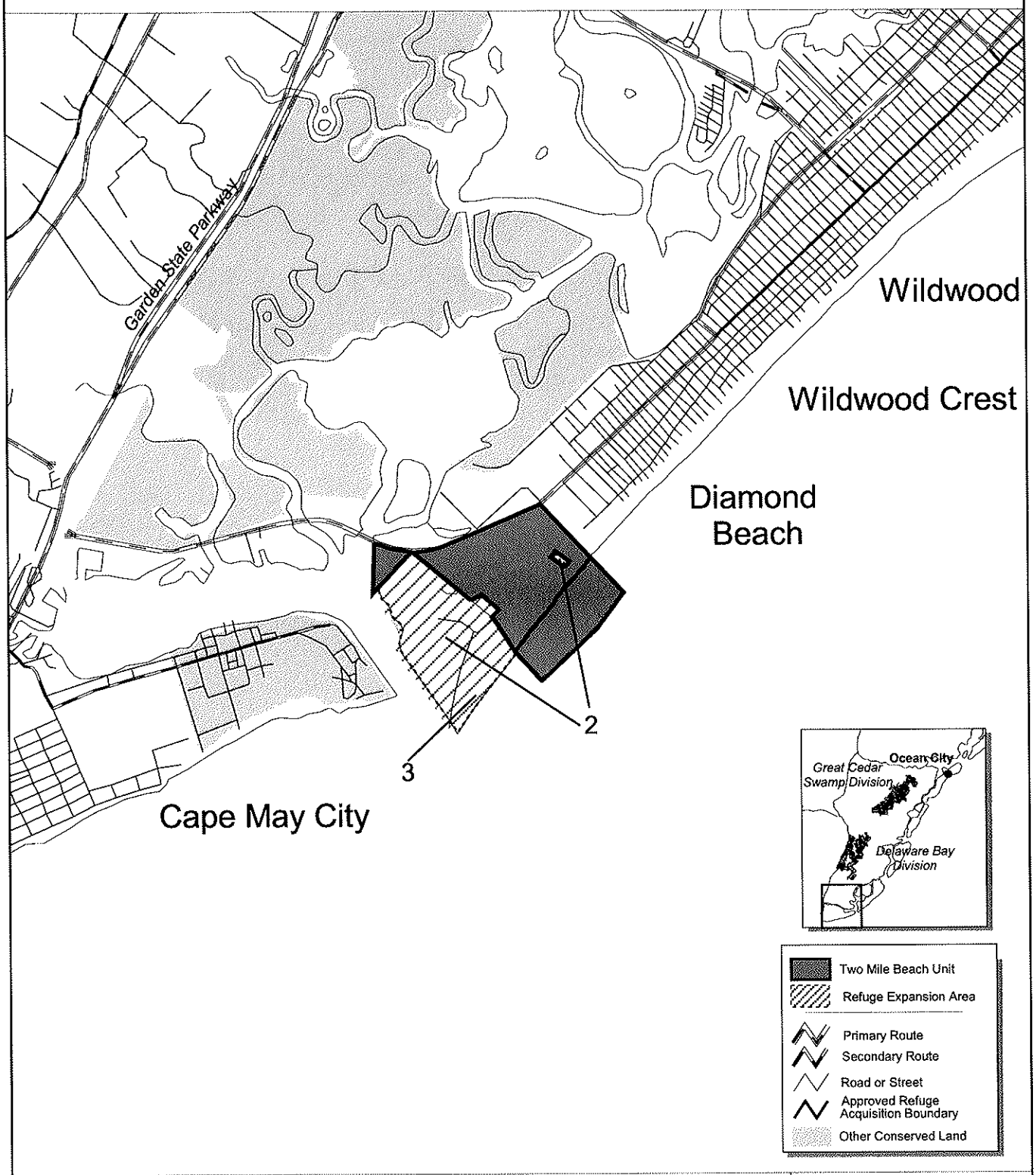
Refuge Vision

The following statement was developed to describe the desired future status of Cape May Refuge.

> "*Cape May National Wildlife Refuge will continue to contain some of the most important migratory bird habitat in the National Wildlife Refuge System. It will continue to be focal points for the protection, management, restoration, and enjoyment of migratory birds and other Federal Trust Resources in coastal New Jersey. The Refuge will provide stop-over and wintering habitats of sufficient size and quality to assist in maintaining migrating birds on the Atlantic Flyway.*

Refuge Expansion Areas

Cape May National Wildlife Refuge, Two Mile Beach Unit,
Lower Township, Cape May County, New Jersey



Data Sources:
USGS 1:100,000 roads & hydro.
New Jersey - other protected land.
USFWS refuge boundaries & other refuge information.

Map prepared for Jersey Coast Refuges Comprehensive Conservation Plan, November 2001.
This map is for planning purposes only.

0 0.5 1 1.5 2 Miles

0 0.3 0.6 0.9 1.2 1.5 Miles

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The Refuge will expand its role in land protection efforts by acquiring additional habitat along the coast and inland watersheds, and working with all interested parties to promote conservation efforts on non-refuge lands. The Refuge will preserve important plant and animal populations, ecological communities, and the integrity of the landscape by protecting lands from development, restoring fire to the upland habitats, and restoring wetlands. It will play a critical role in preserving biodiversity locally, regionally and within the Refuge System.

The Refuge will build alliances with State, county and local governments, other organizations and local communities to promote the ecological integrity of the landscape, ecotourism and the historical and cultural attractions of the region. The Refuge will provide wildlife-dependent recreational opportunities for hunting, fishing, wildlife observation and photography, environmental education and interpretation on Refuge lands. The Refuge will help assure the sustainable economic viability of the area, and supplement and promote the values which attracted people and wildlife to the Jersey Shore in the first place."

National and Regional Mandates

This section presents hierarchically, from the national-level to the local-level, highlights of legal mandates, Service policy, and existing resource plans which directly influenced development of this CCP.

The U.S. Fish and Wildlife Service and its Mission

National Wildlife Refuges are managed by the Service, part of the Department of the Interior. The mission of the Service is:

"*...working with others, to conserve, protect and enhance fish, wildlife and plants and their habitats for the continuing benefit of the American people.*"

National resources entrusted to the Service for conservation and protection are: migratory birds, endangered species, interjurisdictional fish, wetlands, and certain marine mammals. The Service also manages the Refuge System and national fish hatcheries, enforces federal wildlife laws and international treaties on importing and exporting wildlife, assists with state fish and wildlife programs, and helps other countries develop wildlife conservation programs.

The National Wildlife Refuge System and its Mission

The Refuge System is the world's largest collection of lands and waters set aside specifically for the conservation of wildlife and ecosystem protection. Over 520 National Wildlife Refuges are part of the national network today. Refuges occur in every state and a number of U.S. Territories, encompassing over 92 million acres nationwide. Over 34 million visitors annually hunt, fish, observe and photograph wildlife, or participate in environmental education and interpretive activities on Refuges.

In 1997, the National Wildlife Refuge System Improvement Act (Refuge Improvement Act) was passed. This legislation established a unifying mission for the Refuge System, a new process for determining compatible activities on Refuges, and the requirement to prepare CCPs for each Refuge. The Act states that above all else, wildlife comes first in the National Wildlife Refuge System. The Act does this by establishing that wildlife conservation is the principal mission of the Refuge System; by requiring that we maintain the biological integrity, diversity, and environmental health of each refuge and the Refuge System; and by mandating that we monitor the status and trends of fish, wildlife, and plants on each refuge. The Act

further states that the national mission, coupled with the purpose(s) for which each Refuge was established, will provide the principal management direction for each Refuge.

The mission of the Refuge System is:

> "*...to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.*" *(National Wildlife Refuge System Improvement Act of 1997, Public Law 105-57)*

The Refuge Improvement Act declares that all existing or proposed public uses must be "compatible" with the purposes for which each refuge was established. Six wildlife-dependent public uses were highlighted in the legislation as priorities to evaluate in CCPs. The six uses are: hunting, fishing, wildlife observation and photography, environmental education and interpretation. "Compatibility" is determined by the Refuge Manager after evaluating the activities' potential impact on Refuge resources.

Other Legal and Policy Mandates

While the Refuge System Mission and the purposes for which each refuge was established provide the foundation for management, National Wildlife Refuges are also governed by other federal laws, executive orders, treaties, interstate compacts, and regulations pertaining to the conservation and protection of natural and cultural resources. Appendix A provides a summary of some of the most important Federal laws related to management of National Wildlife Refuges.

Service policies providing guidance on planning and the day-to-day management of a Refuge are contained within the Refuge System Manual and the Service Manual.

Fulfilling the Promise, The National Wildlife Refuge System: Visions for Wildlife and Habitat, People, and Leadership

This report (USFWS, March 1999) resulted from the first-ever Refuge System Conference held in Keystone, Colorado in October 1998, and attended by every Refuge manager in the country, other Service employees, and leading conservation organizations. The report contains 42 recommendations dealing with Wildlife and Habitat, People, and Leadership. This CCP deals with all three of these major topics, and we have looked to the 42 recommendations for guidance throughout the project.

North American Waterfowl Management Plan: Atlantic Coast Joint Venture

This Plan (USFWS, 1986) documents the strategy among the United States, Canada, and Mexico to restore waterfowl populations through habitat protection, restoration, and enhancement. The Plan includes ten regional habitat "Joint Ventures" that are partnerships involving federal, state and provincial governments, tribal nations, local businesses, conservation organizations, and individual citizens. Cape May Refuge lies within the Atlantic Coast Joint Venture. Seven focus areas, totaling more than 90,400 acres, have been identified for protection in New Jersey. Both wetlands and adjacent uplands are part of the focus areas.

The goal for the Atlantic Coast Joint Venture is:

> "*Protect and manage priority wetland habitats for migration, wintering, and production of waterfowl, with special consideration to black ducks, and to benefit other wildlife in the joint venture area.*"

In addition to the ten regional habitat joint ventures, there are two species joint ventures: Arctic Goose and Black Duck. Since black ducks winter in New Jersey, the goals and objectives of the Black Duck Joint Venture apply to management of Cape May Refuge. The coastal salt marsh habitats along the mid-upper Atlantic coast have been identified by the Black Duck Joint Venture as the most important habitat for wintering black duck.

Partners In Flight Land Bird Conservation Plan: Mid-Atlantic Coastal Plain (Physiographic Area #44)

The Partners in Flight Program is developing a plan for the Mid-Atlantic Coastal Plain Physiographic Area (USFWS, April 1999). Habitat loss, land bird population trends, and vulnerability of species and habitats to threats are all factors used in the priority ranking of species. Further, the plan will identify focal species for each habitat type from which population and habitat objectives and conservation actions will be determined. This list of focal species, objectives and conservation actions will help direct land bird management on Cape May Refuge.

The draft plan ranks species and habitats on the basis of overall conservation priority. The following first tier priority land birds breed on the Refuge:

- piping plover;
- salt marsh sharp-tailed sparrow;
- seaside sparrow;
- American black duck;
- eastern wood-pewee;
- clapper rail;
- American oystercatcher.

The first-tier is "high overall (global) priority," which indicates high vulnerability of a species throughout its range.

Furthermore, more than 15 additional second-tier priority land birds breed on Cape May Refuge. The second-tier is "high physiographic area priority."

Also, seven of the eight priority habitat types identified in the plan are found currently or historically on the Refuge:

- pine savannah;
- barrier and bay islands;
- salt marsh;
- forested wetland;
- mixed upland forest;

- early succession old field and shrub/scrub;
- fresh/brackish emergent wetland.

Regional Wetlands Concept Plan - Emergency Wetlands Resources Act, Northeast Region

In 1986, Congress enacted the Emergency Wetlands Resources Act to promote the conservation of our nation's wetlands. The Act directed the Department of the Interior to develop a National Wetlands Priority Conservation Plan identifying the location and types of wetlands that should receive priority attention for acquisition by federal and state agencies using Land and Water Conservation Fund appropriations. In 1990, the Service's Northeast Region completed a Regional Wetlands Concept Plan (USFWS, October 1990) to provide more specific information about wetlands resources in the Northeast. The Regional Plan identifies a total of 850 wetland sites that warrant consideration for acquisition, and also identifies wetland values, functions, and potential threats for each site. The Plan identifies one site within Cape May Refuge: Great Cedar Swamp.

The Nature Conservancy Delaware Bay Project

The Nature Conservancy is a nonprofit conservation organization. Its mission is to preserve plants, animals and natural communities that represent the diversity of life on earth by protecting lands and waters they need to survive. The Nature Conservancy joins forces with communities and public and private organizations to pioneer conservation programs around the world.

The Nature Conservancy has targeted the Delaware Bayshore for protection and has established the Delaware Bayshore Ecosystem Project, which includes Cape May and Cumberland Counties in New Jersey. Through the project the Nature Conservancy hopes to identify techniques to balance conservation needs with the need to develop sustainable economic uses. The Conservancy hopes to improve stewardship of private and public land. The Conservancy seeks to promote better coordination between public agencies, private landowners, citizens and nonprofit organizations active in the area. The Conservancy stresses the importance of biological diversity and the unique characteristics which enables the Delaware Bayshore to serve as an important reservoir of our natural heritage.

Relevant Ecosystem and Species Recovery Plans

Throughout the last decade, the Service has been putting more emphasis into defining and protecting entire ecosystems. To this end, the Service has initiated new partnerships with private landowners, state and federal agencies, corporations, conservation groups, and volunteers. Implementing an Ecosystem Approach to Fish and Wildlife Conservation is a top national priority for the Service. Fifty-two Ecosystem teams were formed across the country, typically using large river watersheds to define ecosystems. Individual Ecosystem Teams are comprised of both the Service and our partners, who work together to develop goals and priorities for research and management.

Cape May Refuge lies within both the Hudson River/New York Bight Ecosystem and the Delaware River/Delmarva Coastal Ecosystem.

Hudson River/New York Bight Ecosystem Plan

The following resource priorities from this plan (USFWS, September 1994) are relevant to Cape May Refuge:

- Protect and restore migratory birds, threatened and endangered species, and species of special concern associated with native grasslands and forest habitats.

- Protect, restore and enhance populations of beach-dependent plants and animals, with emphasis on threatened and endangered species, and species of special concern.

- Increase populations of colonial nesting water birds, shorebirds, waterfowl, and inter-jurisdictional fish requiring shallow water, salt marshes, adjacent uplands, and coastal lagoons and rivers.

Delaware River/Delmarva Coastal Ecosystem

The following resource priorities for the Delaware River/Delmarva Coastal Ecosystem are relevant to Cape May Refuge:

- Protect, restore and enhance migratory bird habitat and populations, with emphasis on the coastal migration corridor.

- Protect, restore, and enhance wetland habitats, with emphasis on Service-owned wetlands and other areas of exceptional value.

- Protect and enhance populations of threatened, endangered, and candidate species and their habitats.

- Protect and enhance populations of inter-jurisdictional fish and their habitats.

- Protect, restore, and manage Trust Resources on Service-owned lands.

Piping Plover (Charadrius melodus), Atlantic Coast Population, Revised Recovery Plan

The primary objective of the revised recovery plan (USFWS, May 1996) is to remove the Atlantic coast piping plover population from the List of Endangered and Threatened Wildlife and Plants by:

- Achieving well-distributed increases in numbers and productivity of breeding pairs;

- Providing for long-term protection of breeding and wintering plovers and their habitat.

The Revised Recovery Plan describes detailed "Recovery Tasks" needed to meet the recovery objective, including:

- Monitoring to identify limiting factors;

- Control of feral animals and predators;

- Erect exclosures for protection from predators.

Recovery Plans for Other Federally Listed or Recovered Threatened or Endangered Species

Where the following federally listed threatened or endangered species occur on Cape May Refuge, we will follow the management goals and strategies laid out in their respective recovery plans: peregrine falcon, bald eagle, seabeach amaranth, and swamp pink. This list will change as new species are listed, delisted, or discovered on Refuge lands.

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Chapter 2. Planning Process

The Comprehensive Conservation Planning Process

The effort to prepare a Comprehensive Conservation Plan (CCP) for Cape May Refuge began in the summer of 1996. It was part of a joint effort including both Edwin B. Forsythe and Cape May National Wildlife Refuges, collectively know as the Jersey Coast Refuges. The Service's action followed President Clinton's signing of Executive Order 12996, on the Management and General Public Use of the National Wildlife Refuge System. In recognition of the Order's four guiding principles, the Service focused its planning efforts on:

- Conserving and enhancing the quality and diversity of fish and wildlife habitat within the Refuges;
- Providing opportunities for compatible wildlife-dependent recreational activities involving hunting, fishing, wildlife-observation and photography, environmental education and interpretation;
- Establishing partnerships with other Federal agencies, State agencies, tribes, organizations, industry and the general public;
- Increasing opportunities for public involvement in the planning of refuge land protection and management activities.

This effort continued and was enhanced following passage of the Refuge Improvement Act in 1997. The Act states that the Service shall:

- Propose a CCP for each refuge or related complex of refuges;
- Publish a notice of opportunity for public comment in the Federal Register on each proposed CCP;
- Issue a final CCP for each refuge consistent with the provisions of this Act and, to the extent practicable, consistent with fish and wildlife conservation plans of the State in which the refuge is located;
- Not less frequently than 15 years after the date of issuance of a CCP, and every 15 years thereafter, revise the CCP as may be necessary.

Initially, we focused on collecting information on natural resources and public use. In addition, we developed a vision statement and preliminary goals for the Jersey Coast Refuges, as well as the preliminary issues to be addressed in this planning effort. A mailing list of organizations and individuals was also compiled to insure that we were contacting a wide array of interested publics.

In November and December 1996 a series of eleven public scoping meetings were held in:

- Ocean County--the Townships of Brick, Dover, Lacey, Stafford, and the Boroughs of Long Beach and Tuckerton;
- Atlantic Count--the Township of Galloway;
- Cape May County--the Townships of Upper, Dennis, Middle, and Lower.

We announced the location, dates, and times for these meetings in local newspapers and through special mailings. We also briefed local members of Congress on the upcoming meetings. More than 280 people attended the meetings, which were held to let people know what the Service was doing to manage the Jersey Coast Refuges, and to elicit their input on topics of interest to them.

We also distributed an "Issues Workbook"to help collect the public's ideas, concerns, and suggestions on important issues associated with managing the Jersey Coast Refuges. We distributed the workbook to everyone on our mailing list, those who attended the public meetings, and anyone who subsequently requested one. Nearly 1,000 copies were distributed. Through the workbook, we asked for public input on the issues and possible action options, the things people valued most about the New Jersey coast, their vision for the future, and the Service's role in helping to conserve, protect, and enhance fish and wildlife and their habitats. More than 150 copies of the workbook were completed and returned.

In February 1997 we distributed a "Planning Update" which summarized the responses received in the "Issues Workbook". Responses from the workbooks and meetings were influential in helping us formulate the issues related to resource protection and public use.

In April 1997 we also held an Alternatives Workshop. Twenty-five individuals, representing local and State conservation agencies and organizations, participated in the daylong workshop. The participants reviewed and discussed the issues and concerns identified in the "Issues Workbook" and were asked to answer three questions:

1) What should be done?

2) Where should it be done?

3) Who should help the Service do it?

Input obtained from the public meetings, workbooks and workshop was used to identify a reasonable range of alternatives and prepare a Draft Comprehensive Conservation Plan and Environmental Assessment (CCP/EA) in compliance with the National Environmental Policy Act of 1969 (NEPA). This Draft CCP/EA was released for 45 days of public review and comment in May 1999. Over 200 people attended the three public meetings held in July 1999 at the following locations: Middle Township Municipal Building in Cape May County; Galloway Township Library in Atlantic County; and Stafford Township Municipal Building in Ocean County.

We also received over 1,600 individual comment letters. There were a great many duplicate comments received, since many people sent copies to both the Forsythe Refuge headquarters in Oceanville, New Jersey and our Regional Office in Hadley, Massachusetts. A summary of the public comments received and the disposition of the concerns expressed in those comments can be found in Appendix B. This summary also notes where we have changed the draft CCP/EA or why we did not make such changes.

On July 2, 2000 a Revised Draft CCP/EA for the Jersey Coast Refuges was released for 30 days of public review and comment. A formal public hearing was held July 19, at the Absegami High School in Galloway Township, Atlantic County, New Jersey. Some 80 people were in attendance. The majority of the speakers, including a legislative staff member representing Congressman Jim Saxton, were opposed to the proposed year-round beach closure to motor vehicles at the Holgate Unit of Forsythe National Wildlife Refuge. Most also spoke in opposition to the proposed seasonal beach closure at the Two Mile Beach Unit of Cape May National Wildlife Refuge.

During the comment period we received over 1,700 written comments. Of these, 1,159 opposed and 543 supported the proposed beach closures. Many of the latter comments also urged that we petition the State

Tidelands Council to close the State owned intertidal area (i.e., the lands below the mean high tide line) on the Holgate Peninsula to motorized vehicle use. Following the 30-day public review period, we compiled and responded to the comments received. A summary of the public comments received and the disposition of the concerns expressed in those comments can be found in Appendix C.

This CCP, reflecting the Service's Proposed Action for Cape May Refuge found in the Revised Draft CCP/EA, is supported by a Finding of No Significant Impact (FONSI), which may be found in Appendix D. With the signing of this FONSI by our Regional Director, implementation of the CCP can begin. This CCP will be monitored annually and revised when necessary.

Figure 1 describes the steps of the Service's CCP process and how it is integrated with the NEPA process.

Planning Issues

Together with the Refuge Vision Statement (page 3) and Refuge goals (beginning on page 31), the following key issues for Cape May Refuge, and the range of options on how to resolve them, formed the basis for the preparation of the Draft CCP/EA.

Managing habitats and wildlife populations

This issue was identified as being very important by the public at our scoping meetings, in the workbook and at the workshop. A number of different management activities were suggested, including: habitat manipulation and restoration (e.g., burning, water level control, planting, mowing), wildlife population management, baseline surveys of wildlife species and ecological communities, population and habitat monitoring, and research. Other activities suggested include working with partners on cooperative efforts for habitat restoration and management on private lands.

Some members of the public requested that we provide furbearer trapping opportunities at Cape May Refuge. They noted that trapping is a necessary and important wildlife management tool. Other people objected to trapping.

Trapping is often used on National Wildlife Refuges to protect endangered and threatened species from predators, to protect refuge infrastructure, and to maintain furbearer populations at levels consistent with refuge objectives.

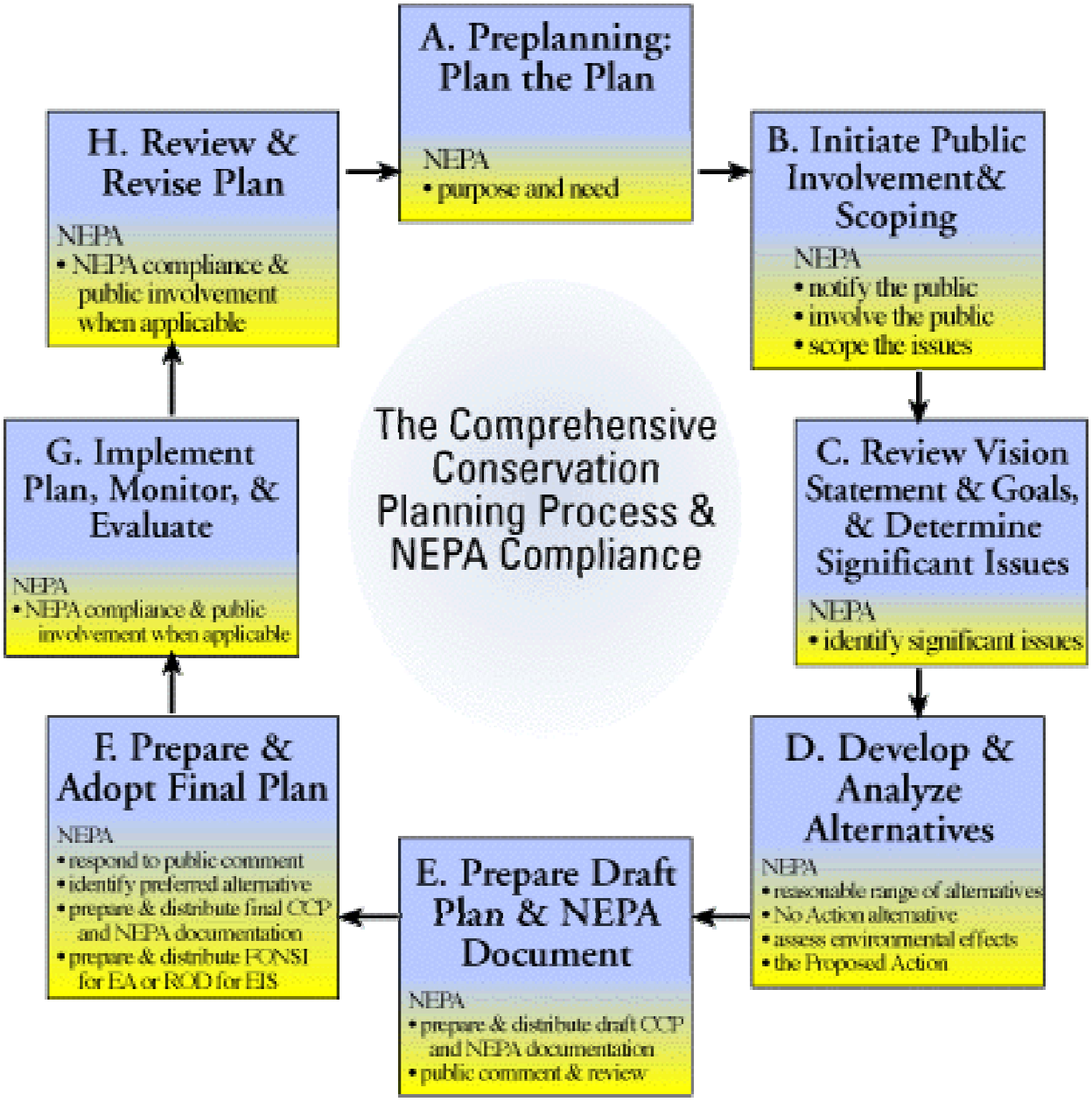
The protection and management of wildlife populations and habitats is the fundamental mission of the Refuge System and Cape May Refuge. Special emphasis is placed on federal trust resources, including: endangered species, migratory birds, interjurisdictional fish, marine mammals, and wetlands.

Controlling invasive and overabundant species

Dealing with this issue is not only a national initiative for the Service, but was also deemed very important by the public at the meetings, in the workbook and at the workshop. The methods used to control these species are also of great concern.

Cape May Refuge has significant problems involving invasive species, which impact native species directly, displacing or killing individuals, destroying habitats, and disrupting ecological communities. Invasive species requiring control are mostly exotics not native to the New Jersey landscape (e.g., Japanese

Figure 1. The Comprehensive Conservation Planning Process and NEPA Compliance.



honeysuckle, European bittersweet, autumn olive).

Wildlife species may be deemed overabundant for various management objectives. Overabundant species (e.g., white-tailed deer), may degrade habitat quality or the overall integrity of an ecological community, or in the case of species like raccoon, displace or prey upon other species that are actively being restored. Other species (e.g., mosquitos), because of their numbers, may pose a human health risk, (**Mosquito control**, page 18). Deer and furbearer control activities are discussed below under **Increased opportunities for hunting** and **Managing habitats and wildlife populations**, page 13.

The effects of pesticides on fish, wildlife and plants

The public identified the presence of pesticides and chemicals in the environment as an important issue. Chemicals and pesticides from activities taking place on the Refuge or from off-refuge sources may impact fish, wildlife and plants found on Cape May Refuge. Such chemicals may be transported to the Refuge by wind, water or other mechanisms, or picked up off-refuge by fish and wildlife during their migrations. Many people encouraged us to minimize our use of chemicals and pesticides on the Refuge.

One of the major uses of pesticides in Cape May County is to control mosquitos. Integrated Pest Management (IPM) is an overall strategy to reduce pesticide use. IPM for mosquito control includes Open Marsh Water Management (OMWM). Because of OMWM done on the Refuge by the Cape May County Mosquito Control Commission, no mosquito control pesticides have been used on the Refuge in several years.

Increasing opportunities for hunting

Many people identified hunting on the Refuge as an important issue during the public scoping meetings, in the workbook and at the workshop. Some voiced concern over the Service's policy of restricting access to lands that were historically available for hunting. Others felt that hunting should not be permitted on the Refuge, often citing safety concerns and impacts on wildlife.

Hunting has long been a traditional activity in coastal New Jersey. Local residents have hunted much of the land within the current and proposed boundaries of the Refuge in the past.

At Cape May Refuge, deer hunting is allowed on most of the Refuge. Upland game hunting is not allowed. Migratory game bird hunting is allowed in designated areas. Some people called for upland game hunting opportunities on the Refuge. Others called for additional opportunities to hunt migratory game birds on the Refuge.

Because hunting is one of the six priority general public uses of the Refuge System, it "...shall receive priority consideration in refuge planning and management." (National Wildlife Refuge System Improvement Act). Refuge hunt programs must consider public safety, disturbance and other harm to wildlife, harm to habitat, and conflicts between different user groups.

Increasing opportunities for fishing

Many people identified fishing on the Refuge as an important issue during the public scoping meetings, in the workbook and at the workshop.

The Service does not have management or law enforcement authority over fishing from boats in tidal waters within Refuge boundaries. Cape May Refuge is currently not open to fishing. Refuge beaches below mean high tide are under the jurisdiction of the New Jersey Tidelands Council, with the exception of Cape May Refuge's Two Mile Beach Unit.

Because fishing is one of the six priority general public uses of the Refuge System, it "...shall receive priority consideration in refuge planning and management." (National Wildlife Refuge System Improvement Act). Refuge fishing programs must consider public safety, disturbance and other harm to wildlife, harm to habitat, and conflicts between user groups.

Increasing opportunities for wildlife observation and photography

There was a great deal of interest expressed in expanding wildlife observation and photography opportunities on the Refuges at the public scoping meetings, in the workbook and at the workshop.

The fact that Cape May peninsula is a world-renowned destination for bird watchers is reflected in the high number of visitors and the diversity of their hometowns. As hundreds of thousands of migratory birds use the Refuge each year, so tens of thousands of visitors come each month to observe them.

Because wildlife observation and photography are two of the six priority general public uses of the Refuge System, they "...shall receive priority consideration in refuge planning and management." (National Wildlife Refuge System Improvement Act). Refuge wildlife observation and photography programs must consider public safety, disturbance and other harm to wildlife, harm to habitat, and conflicts between different user groups.

Increasing opportunities for environmental education and interpretation

There was more interest in expanding environmental education and interpretation opportunities at the Refuge than any of the other priority public uses. In fact, there was great interest in increasing outreach efforts to local schools and communities as well. Quite often people expressed an interest in promoting more environmentally friendly recreational activities while expressing concern for minimizing impacts on the resources. Many encouraged the Refuge to place special emphasis in education and interpretation efforts on: the impacts of public use on wildlife and how those impacts can be reduced; how the public can help wildlife both at the Refuge and in their own back yards; and the importance of refuges in conserving wildlife and their habitats.

Because environmental education and interpretation are two of the six priority general public uses of the Refuge System, they "...shall receive priority consideration in refuge planning and management." (National Wildlife Refuge System Improvement Act). Refuge environmental education and interpretation programs must consider public safety, disturbance and other harm to wildlife, harm to habitat, and conflicts between different user groups.

Increasing opportunities for land protection

During the public scoping meetings, in the workbooks and at the workshop, people expressed a great deal of support for the protection of additional fish and wildlife habitat, and suggested that this occur not only through an expanded land acquisition program at Cape May Refuge, but also by working cooperatively with others to protect non-refuge lands as well. There is considerable interest in increasing land protection efforts at the Refuge, especially lands supporting federal trust species. The location of Cape May Refuge on the peninsula makes it particularly important to the successful migration of birds in the Atlantic flyway.

Increasing resource protection and visitor safety

People identified resource protection and visitor safety as a concern during the public scoping meetings, in the workbook and at the workshop.

New Jersey is the most densely populated state in the nation. Development in both Atlantic and Cape May Counties has increased markedly since the birth of the Atlantic City casino industry in the 1980's. Refuge law enforcement is not limited to wildlife related violations, but include a broad spectrum of violations, for example, vandalism, trespass, and controlled substances. Posting new Refuge properties remains a constant logistical problem. Public use is expected to increase rapidly as more of Atlantic City's 35 million annual visitors and the Cape May County millions of summer visitors discover Cape May Refuge.

The current staff of one full-time Park Ranger is insufficient to adequately patrol the Refuge and enforce Refuge and other Federal regulations.

Improving Refuge buildings and facilities

The existing buildings and facilities at Cape May Refuge are woefully inadequate and need to be replaced. This is especially important if the Refuge is to adequately accommodate work space for not only their current staff, but also any future increases in staffing levels that would be required to implement the actions and strategies in the Refuge CCP. Additional laboratory and equipment storage space is also needed.

New facilities would help increase the Service's visibility in coastal New Jersey and improve the visitor services, including providing opportunities for environmental education and interpretation.

Use of the existing buildings at the Two Mile Beach Unit

A number of groups expressed interest in using the former Coast Guard buildings located at the Two Mile Beach Unit. There was also interest in seeing these buildings removed and restoring the habitat. The Two Mile Beach Unit habitat is considered the best remaining piece of maritime forest found on the New Jersey coast and an area critical to migrating birds. It is also within the 100-year floodplain.

In 2002 all but three buildings were demolished and the former building sites were restored to native maritime habitat. The remaining buildings are planned to be used for a visitor contact/office complex, and two maintenance facilities, one of which is currently being used by the Coast Guard.

Public access to the Two Mile Beach Unit

Some people expressed concern at the public scoping meetings, in the workbook and at the workshop, about the possibility that the Service would close the beach during the piping plover breeding season.

Although the Coast Guard never officially sanctioned public access to the beach, they did allow people to walk along the beach surf line and by that route to access the jetty at Cold Spring Inlet, a popular fishing location. In the past, this beach has supported nesting piping plovers and the least tern. The Service enforced an annual beach closure during the breeding season starting in 2000. Piping plovers and least terns have nested on the beach since 2000 for the first time since 1994 and 1988, respectively.

Issues Outside the Scope of the CCP/EA

These issues do not fall within the scope of The Purpose of and Need for Action and the Decision to be Made in the CCP/EA. Issues within this category will not be further addressed. The Service will, however, pursue other courses of action, often in cooperation with other interested parties, to resolve them.

Protecting sensitive areas from personal water craft use

Many people expressed concern over the use of personal water craft at the public scoping meetings, in the workbook and at the workshop.

Personal water craft use in the State-managed waters surrounding or adjacent to lands of the Refuge has risen dramatically. The Refuge does not have jurisdiction over these activities in these waters.

Personal water craft have made previously inaccessible Refuge areas susceptible to adverse habitat and wildlife impacts. Their use has increased wildlife-human interactions, involving disruption of roosting, foraging, and nesting birds over large areas of the Refuge.

The Service will increase its education and outreach efforts regarding the responsible use of personal water craft, and will work closely with the State to seek solutions for resolving this perplexing problem.

Mosquito control

Several species of mosquitos found in coastal New Jersey are important vectors of potentially lethal diseases, including Eastern Equine Encephalitis and West Nile Virus. The Service is striving to responsibly address risks to public health and safety and to protect trust resources from mosquito borne diseases and the impacts of pesticides on wildlife and the ecosystem. The Service and the mosquito control agencies in New Jersey and Delaware are working to develop new strategies for mosquito control, with appropriate NEPA compliance. The public will have the opportunity to review and comment on the proposed strategies before they are finalized.

Chapter 3. Summary Refuge and Resource Descriptions

Cape May Refuge

Physical Environment

Climate

Cape May National Wildlife Refuge (Cape May Refuge) is within the New Jersey coastal weather station zone (Sandy Hook, Long Branch, Atlantic City, and Cape May weather stations). The ocean moderates the State's continental climate within the coastal weather zone. The average monthly temperature is 35°F in January, the coldest month of the year, and 75°F in July, the hottest month of the year. The growing season for the Refuge is 255 days. The growing season is the period of the year in which the average temperature is 43°F or more. The average annual precipitation in the coastal zone is 42.6 inches. Precipitation is distributed fairly evenly through the year, with slightly more in July and August, and less in February.

Geology, Topography and Soils

The Cape May Refuge is within the Outer Coastal Plain, which consists of sedimentary deposits dating from the Tertiary Period. Elevations in Cape May County range between sea level and 55 feet above mean sea level. The interior of Cape May County consists of low rolling hills and poorly drained depressions. The ocean side of the County consists of broad tidal marsh areas fronted by barrier islands. There are well developed sand dunes in some places on the ocean barrier islands and along the shore of Delaware Bay in the southwestern part of the County.

The major soil series in the Great Cedar Swamp Division of Cape May Refuge are Barryland and Mullica-Manahawkin Association and Transquaking-Appoquinimink-Mispillion-Pawcatuck Association. The major soils series in the Delaware Bay Division are Barryland and Mullica-Manahawkin Association and Transquaking-Appoquinimink-Mispillion-Pawcatuck Association, Downer-Ingleside-Swainton Association, and Hammonton Association. The soil series on the Two Mile Beach Unit are Transquaking-Appoquinimink-Mispillion-Pawcatuck Association and Urban land-Psamments-Beaches Association.

Hydrology

The Cape May Refuge is located within the New Jersey Coastal Plain with the underling aquifers consisting of the Kirkwood-Cohansey aquifer system and the Atlantic City 800-foot sand. The Cape May Peninsula is surrounded on three sides by salt water and the groundwater recharge areas for the aquifers are not as large as farther north along the coast. Because of these two factors, saltwater intrusion into the Choansey aquifer is a substantial problem in the area. The City of Cape May has constructed a $5 million desalination plant, because it can no longer extract suitable freshwater from some of its five wells. The plant's capacity is two million gallons of water per day. The estimated operating and maintenance costs are $500,000 per year.

Cape May Refuge has both tidal and non-tidal surface waters. Non-tidal waters include marshes, bogs, ponds, creeks, and seasonally flooded forests. Tidal waters include ponds, salt and fresh marshes, creeks and old ditches, coves, bays, and inlets. Most of the salt marsh is tidally inundated daily, with the greatest inundation occurring at new and full moons.

The Great Cedar Swamp Division is drained by Cedar Creek and Dennis Creek; the Delaware Bay Division is drained by Bidwell Creek, Dias Creek, Green Creek, and Fishing Creek. These streams display low

runoff, about half the volume of other streams in the State, which indicates a high infiltration rate. The Bidwell's Creek drainage basin has been identified by the County as one of the region's most important groundwater recharge areas. Other major groundwater recharge areas in the County are near Cape May Court House and Cold Spring.

Contaminants

The Service collected sediments, mummichogs, and fiddler crabs at 25 locations in and adjacent to the Cape May Refuge in 1992 to determine baseline contamination. The 25 locations included all major drainages and selected tidal creeks. The Service analyzed the sediments and mummichogs for trace metals, organochlorine pesticides and polychlorinated biphenyls (PCB's); the fiddler crabs were analyzed only for organochlorines (USFWS, 1994b).

The sediment trace metal concentrations were considered to be typical for sediments in southern New Jersey and probably represent site-specific background levels. Although low, the concentrations of arsenic, beryllium, cadmium, chromium, copper, iron, lead, mercury, nickel, and zinc at one or more sample locations exceeded sediment "effects range-low" levels developed by the National Oceanic and Atmospheric Administration, and freshwater sediment "lowest effects" levels developed by the Ontario Ministry of the Environment. Because sediment trace metal concentration levels did not exceed more severe effects levels, the potential for adverse effects on benthic organisms exposed to the contaminants is low to non-existent. The mean trace metal levels found in mummichogs and fiddler crabs were at the low end of ranges typically observed in New Jersey. The maximum trace metal levels found in mummichogs and fiddler crabs appeared to be well below levels of concern for fish and wildlife.

None of the twenty organochlorine tested for were detected in the sediment samples (average detection limit = 0.04 ppm dry weight). The only organochlorine detected in the mummichogs and fiddler crabs were the DDT breakdown products, DDD and DDE. The average combined DDD and DDE concentrations were comparable to background levels for New Jersey. The maximum combined DDD and DDE level found (0.18 ppm wet weight in mummichogs and 1.04 ppm wet weight in fiddler crabs), however, were greater than the background levels. Organochlorine concentration levels in Cape May Refuge area mummichog and fiddler crab populations are low and are not expected to adversely affect the organisms or their immediate predators.

Although low, the concentrations of DDD and DDE did not appear to decline significantly since 1989–the last previous sampling. Although the use of the parent compound DDT ceased in the mid-1960's, it is possible that weathered material continues to enter the estuarine ecosystem as previously contaminated areas are disturbed through dredging or erosion.

Biological Environment

There is an extensive description of the plant and animal communities in the Cape May Refuge area in "Significant Habitats and Habitat Complexes of the New York Bight Watershed" (USFWS, 1997). The most important biological features of the locality include the estuaries associated with Delaware Bay and the Atlantic coast, the transition between southern and northern species assemblages, and the unique and critical role the peninsula plays as a staging area and corridor for bird migration.

Threatened, Endangered, Recovered and Rare Species

There are 12 species in and around Cape May Refuge that are Federally-listed endangered, threatened, recovered, or species of concern, formerly called candidate species (Appendix E). The listed species for which the most information is available are the peregrine falcon and bald eagle. Fall raptor surveys conducted at Cape May Point by the Cape May Bird Observatory since 1976 have demonstrated a dramatic increase in observations of both species. Over the past 10 years, peregrine falcon 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 forest edge habitats for roosting. The Dennis Creek Marsh is one of the most heavily used raptor sites in New Jersey. The Great Cedar Swamp is an historic nesting site for bald eagles. Although eagles now only roost in the swamp, the area is a potential nesting site.

A number of the other listed species have been documented on Cape May peninsula. There is a strong potential for their occurrence on lands currently owned by the Refuge, or proposed for acquisition.

Vegetation and Habitat Types

About half of the Refuge land at the Cape May Refuge is wetland and about half is upland. Forests (combining upland and wetland types) represent the largest single habitat type for the Refuge.

Most of the wetlands in the Cape May Refuge are dominated by woody vegetation (swamps) not emergent vegetation (marshes). Salt marsh makes up about 15% of the Refuge land, forested wetlands make up 30%, shrub/scrub wetlands and bogs make up about 4%, and open water makes up less than 1%.

Most of the salt marshes were either impounded earlier in the century to create meadows for salt hay production or grid ditched for mosquito control. Most of the impounded areas have been reopened by tidal action or human intervention.

Forested uplands make up about 42% of the Service-owned property at the Cape May Refuge. Upland forests range from deciduous to coniferous dominated overstory composition, with tree species including: pitch pine *(Pinus rigida)*, oaks (e.g., white oak - *Quercus alba*, chestnut oak - *Q. prinus*, black oak - *Q. velutina*, scarlet oak - *Q. coccinea*), black cherry *(Prunus serotina)*, and sweet gum *(Liquidambar styraciflua)*. Fire played a prominent role in defining the composition and structure of upland plant communities, both historically and prehistorically (Little, 1998). There are still some nearby State lands in the Pine Barrens that receive regular fire treatment (both prescribed and wild), but fire on Refuge lands has been suppressed for decades. Other upland habitats include shrub/scrub uplands which make up about 3%, and grassland/old fields uplands which make up about 3%. Beaches make up less than 1% of the Service-owned property.

Unique to the peninsula and present on the Cape May Refuge is the Cape May lowland swamp, a deciduous forest swamp with an unusually high species diversity and found in headwaters areas.

Wildlife Resources

Migratory Birds: The Cape May Peninsula has long been renowned for its spectacular concentrations 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. Facing a 12-mile open water crossing, migrants may rest and feed in the area until favorable winds allow them to either cross Delaware Bay or head back north, up and around the Bay. In addition, the peninsula's extensive marshes attract large numbers of waterfowl, particularly wintering black

ducks, while the bay's narrow beaches attract major assemblages of shorebirds in the spring. Over 360 species of birds can be observed in Cape May County during the year.

The upland shore edge of Delaware Bay is well recognized as a critical fall migratory bird corridor. The wetlands of the Delaware Bay Estuary, which include the Delaware Bay wetlands in the Cape May Refuge, are classified as Wetlands of International Importance under the Ramsar Convention, one of only 17 sites so designated in the United States.

The coastal wetlands of New Jersey, including the Delaware Bay marshes, are of international importance to wintering waterfowl, annually wintering 34% of the entire Atlantic Flyway black duck (Anas rubripes) 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 cause them to remain ice-free when the remainder of the marsh has iced over. These marshes also provide important black duck breeding habitat. Nesting surveys conducted by the New Jersey Division of Fish and Wildlife have found high nest densities in the Delaware Bay Division.

In addition to black duck, Cape May Refuge also supports large numbers of other migrating waterfowl, many of which remain throughout the winter: wood duck *(Aix sponsa)*, blue-winged teal *(Anas discors)*, green-winged teal *(A. crecca)*, American wigeon *(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)*, and Canada goose *(Branta canadensis)*.

Many marsh and water birds use the Refuge. The most common include great blue heron (*Ardea herodias*), great egret (*Casmerodious albus*), snowy egret (*Egretta thula*), black-crowned night heron (*Nycticorax nycticorax*), glossy ibis (*Plegadis falcinellus*) and cattle egret (*Bubulcus ibis*). Herons and egrets nest on or near the Refuge, frequently foraging in the salt marshes, streams, and ponds.

The Delaware Bay shoreline is a major shorebird staging area in North America, second only to the Copper River Delta in Alaska. Delaware Bay is a hemispherically important shorebird site. Hundreds of thousands of shorebirds, nearly 80% of some populations, stop to rest and feed here during their spring migration from South America to their breeding grounds in the Arctic. The arrival of over 20 species of shorebirds, primarily red knots, ruddy turnstones, sanderlings, and semipalmated sandpipers coincides with the peak horseshoe crab spawning season. Horseshoe crab eggs provide an abundant source of food for these shorebirds to replenish their energy reserves.

There is substantial raptor migration through Cape May Refuge, with large numbers of 15 species observed. Each year since 1976, an average of 75,000 hawks have been recorded by the Cape May Bird Observatory. Because these birds are hesitant to cross wide expanses of water, most species migrate along the length of the Bay coast, utilizing the Bayshore upland edge as a migratory corridor.

Notable raptor species include sharp-shinned hawk, Cooper's hawk *(A. cooperii)*, red-tailed hawk, broad-winged hawk, red-shouldered Hawk, northern harrier *(Circus cyaneus)*, American kestrel *(Falco sparverius)*, and merlin *(F. columbarius)*.

Large numbers of owls also migrate through the Cape May Refuge. Typical species include the common barn-owl, northern saw-whet owl *(Aegolius acadicus)*, and long-eared owl *(Asio otus)*. The thick cedar groves and woodlands of the expansion area are important to wintering populations of owls, including long-eared owl, short-eared owl, and northern saw-whet owl.

American woodcock concentrate in large numbers on the Cape May peninsula during the fall migration. The birds utilize the field/forest edge and old field habitats. Cape Charles, Virginia, is the only other area along the Atlantic coast that concentrates woodcock in comparable numbers.

During the fall migration, nearly 100 species of songbirds pass through the County, utilizing a variety of habitat types. An abundance of songbirds also breeds in the field/forest edge habitat of the cedar swamps and salt marsh. Cape May Refuge also provides nesting habitat for regionally and nationally significant species such as rails, Neotropical migrants, and raptors.

Mammals: Over 30 species of mammals occur on the Refuge, in assemblages characteristic of the Mid-Atlantic coastal communities. Forest species include red fox (*Vulpes vulpes*), grey fox (*Urocyon cinereoargenteus*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), long-tailed weasel (*Mustela frenata*), short-tailed weasel (*Mustela erminea*), striped skunk (*Mephitis mephitis*), opossum (*Didelphis virginiana*), white-tailed deer (*Odocoileus virginianus*), grey squirrel (*Sciurus carolinensis*), red squirrel (*Tamiasciurus hudsonicus*), chipmunk (*Tamias striatus*), white-footed mouse (*Peromyscus leucopus*), red-backed vole (*Clethrionomys gapperi*), pine vole (*Microtus pinetorum*), masked shrew (*Sorex cinereus*), short-tailed shrew (*Blarina brevicauda*), eastern mole (*Scalopus aquaticus*), and a variety of bat species. Shrubland and grassland species of mammals include the meadow vole (*Microtis pennsylvanicus*), meadow jumping mouse (*Zapus hudsonius*), woodchuck (*Marmota monax*), eastern cottontail (*Sylvilagus floridanus*), and several of the forest and wetland species. Mammals associated with wetlands include mink (*Mustela vison*), river otter (*Lutra canadensis*), muskrat (*Ondatra zibethicus*), meadow vole, southern bog lemming (*Synaptomys cooperi*), least shrew (*Cryptotis parva*), and marsh rice rat *(Oryzomys palustris)*.

Several species of bats occur in forested habitat types during the summer breeding season. Forest openings are common foraging areas for this group. A number of other migrating bat species probably pass through southern New Jersey during migration, while others would use caves for hibernacula (not found locally). Very little research has been done on bats in the vicinity.

Reptiles and Amphibians: The reptiles and amphibians known to occur on the Refuge represent two major assemblages – Pine Barrens and coastal estuarine environment. Important species from the Pine Barrens group include wood turtles *(C. insculpta)*, Cope's gray and pine barrens treefrog *(Hyla chrysoscelis and H. andersonii)*, ambystomid salamaders *(Ambystoma spp.)*. An important estuarine ecosystem species is the northern diamondback terrapin *(Malaclemys t. terrapin)*.

Fish: The estuarine habitat at Cape May Refuge hosts a wide variety of fish species. Some species, like the mummichog *(Fundulus heteroclitis)*, a common prey species for many larger fish and for wading birds, depend on salt marsh as their primary habitat. Other species depend on the estuary for only a portion of their life cycle. Important commercial and recreational finfish and shellfish species that utilize the estuary during a portion of their life cycle include horseshoe crab *(Limulus polyphemus)*, weakfish *(Cyonscion regalis)*, summer flounder *(Paralichthys dentatus)*, bluefish *(Pomatomus saltatrix)*, black sea bass *(Centropristis striata)*, blue crab *(Callinectes sapidus)*, and hardshell clam *(Mercenaria mercenaria)*. The horseshoe crab is particularly noteworthy. The Delaware Bay hosts the largest concentration of horseshoe crabs, and many birds depend on horseshoe crab eggs for food. (See ***Migratory Birds*** above.)

Archaeological and Historical Environment

Prehistoric Period

The Cape May Refuge and the surrounding area was the subject of an archaeological field school sponsored by Rutgers University and Stockton College from 1995 through 1998. Several prehistoric sites were

discovered, most notably a large site or group of sites on a tidal marsh island that is rapidly eroding. In addition to the expected shellfish and mammal remains, a substantial amount of turtle bone from a variety of species was identified here.

There is a proposal to study the paleoecology of the adjacent marshland, to determine the biological resources available at the time the site was occupied. While the field school was not designed specifically as a planning study to identify archaeological sites in the Refuge, its findings show that the highly varied and changing mix of upland and wetland supported Native American populations in the area for an apparently unbroken period covering the last 12,000 years.

Historic Period

Historic period settlement on the Refuge appears to have been limited. Most of the area was marshland, woodland, or farmland, with little recorded settlement on Refuge property, and apparently few landing areas to provide opportunities for maritime sites. A mill location on one of the streams within the Refuge is one of the few recorded sites. There are no standing historic structures on the Refuge, however there is a family cemetery.

Socioeconomic Environment

As is the case along the rest of the New Jersey coast, tourism is the number one industry in Cape May County. Cape May County is ranked as the second best birding hotspot in all of North America (Konrad, 1996). A recent study estimated that the 100,000 birders who annually visit Cape May County bring more than $31 million into the local economy (Kerlinger, 1997).

There is also a substantial commercial fishing industry in southern New Jersey. Fishing is the second largest industry after tourism in Cape May County. There is an increase in shellfish aquaculture, especially oysters. Bait fish, eel, and horseshoe crabs are also a major component of the industry.

Over the last 20 years, casino development in Atlantic City has spurred a large influx of people to Cape May County. As farther north along the New Jersey coast, this has spurred a rapid construction of housing and support infrastructure (e.g., roads, malls, plazas, and utility towers). The increase in human density and associated uses have caused considerable strains on the ecosystem from the following factors:

1. Habitat loss - direct conversion of natural habitat types to developed types.

2. Habitat fragmentation - conversion of large contiguous tracts of natural habitat types to a mosaic of discontinuous, smaller habitat type relicts; or erecting barriers that cause direct lethal impacts to fish, wildlife and plants (e.g., roads, towers, dams).

3. Habitat degradation - partial deterioration of habitat due to pollution (siltation, nutrients, pesticides, metals), exotic and pest species (phragmites, house cats), incompatible uses (all-terrain vehicles, personal watercraft).

4. Water consumption - reducing subsurface and surface waters due to irrigation, home consumption, and industrial applications.

In addition to these environmental-economic connections, there are others. A study conducted in Minnesota determined that there is a statistically significant positive relationship between the amount of wetland acres in an area and residential property values (Lupi, et al., 1991). The authors were not able to identify which

values were captured (i.e., open space, view, habitat, etc). A study conducted in Maine outlines the economic benefits of open space to local communities (American Farmland Trust, 1992).

Beyond the economic factors in land use planning there are ethical considerations. Is the land a commodity that belongs to us? Or is land a community to which we belong? Are we the masters of the land or are we stewards of the land?

Two Mile Beach Unit

Physical Environment

The "Draft Environmental Assessment for the Closure of Electronic Engineering Center (EECEN)" (USCG, 1996) and the Environmental Baseline Survey Report EECEN (ABB, 1997) contain an extensive description of the Physical, Biological, and Socioeconomic environments of the Electronic Engineering Center.

Originally, the Two Mile Beach Unit (Unit) consisted of 491 acres, 221 of which are above the mean high tide line. Of this acreage, upland habitat makes up 90 acres and wetland habitat the remaining 131. An additional 18 acre parcel of wetland habitat joining the Two Mile Beach Unit was purchased in August 2003 as part of the Unit.

Almost all of Unit is within the 100-year flood plain; the entire Unit is within the 500-year flood plain. The 100-year flood, or intermediate regional tide, would have an elevation of 10.0 feet above mean sea level. The 500-year flood, or standard project tide, would have an elevation of 14.0 feet above mean sea level. The September 1944 hurricane that struck New Jersey had a tide 8.0 feet above mean sea level.

In a 100-year flood, or intermediate regional tide, all of the Unit would be flooded, except for a narrow strip along the top of the barrier dunes. In a 500-year flood, or standard project tide, all of the Unit, including the protective barrier dunes, would be underwater. In either event virtually all the buildings at EECEN would be destroyed or severally damaged (USCG, 1996).

Biological Environment

Threatened, Endangered, Recovered and Rare Species

The piping plover has historically used the beaches as nesting grounds, up to three nesting pairs recorded in a given year. Peregrine falcons stop over before heading for the north coast of South America in the fall, and the American bald eagle has been documented in the area.

Vegetation and Habitat Types

The lands above mean high tide consist of coastal beach and dune habitat and salt marsh habitat.

The beach community is composed of sparse vegetation, including American searocket *(Cakile edentula)*, coast-blite goosefoot *(Chenopdium rebrum)* and beach-heather *(Hudsonia tomentosa)*. The beach dunes are densely vegetated. The dominant dune vegetation includes beachgrass *(Panicum amarum)*, bitter panic grass *(Panicum amarulum)*, American beachgrass *(Ammophila breviligulata)*, American wormseed *(Chenopodium ambrosioides)*, and seaside goldenrod *(Solidago sempervirens)*, bayberry *(Myrica pennsylvanica)*, and black cherry *(Prunus serotina)*. The site is an excellent example of a maritime forest.

Common salt marsh species include saltmarsh cordgrass *(Spartina alterniflora)*, saltmarsh camphor-weed *(Pluchea purpuranscens)*, Carolina sealavender *(Limonium carolinianum)*, salt-meadow grass *(Spartina patens)*, saltmarsh rush *(Juncus gerardii)*, marsh elder *(Iva fructescens)*, and common reed *(Phragmites australis)*.

Wildlife Resources

Migratory birds: Common species include mallard *(Anas platyrhynchos)*, common merganser *(Mergus merganser)*, American coot *(Fulica americana)*, killdeer *(Charadrius vociferus)*, herring gull *(Larus argentatus)*, turkey vulture *(Cathartes aura)*, northern harrier *(Circus cyaneus)*, Cooper's hawk *(Accipiter cooperii)*, red-tailed hawk, American kestrel *(Falco sparverius)*, mourning dove *(Zenaida macrourra)*, eastern screech-owl *(Otus asio)*, belted kingfisher *(Ceryle alcyon)*, northern flicker *(Colaptes aurarus)*, hairy woodpecker *(Picoides villosus)*, downy woodpecker *(Picoides pubescens)*, and purple martin *(Progne subis)*.

Mammals: Many of the mammal species found in dune and tidal wetlands communities of Cape May County occur on the Unit.

Reptiles and Amphibians: Reptile species common in the area include the eastern box turtle *(Terrapene carolina)*, diamond back terrapins, eastern fence lizard *(Sceloporus undulatus)*, and common garter snake *(Thamnophis sirtalis)*. Amphibian species common in the area include eastern newt *(Notophthalmus viridescens)*, grey treefrog *(Hyla versicolor)*, and bullfrog *(Rana catesbeiana)*.

Fish: Fish occurring at Unit would be grouped into two major types: estuarine and near-shore marine. The estuarine systems have already been described above under Cape May Refuge.

Archaeological and Historical Environment

Prehistoric Period

No archaeological surveys have been done at Unit, but the property has potential for prehistoric archaeological sites, especially in areas of wetland edge environments. Several late prehistoric sites have been found nearby in similar settings.

Historic Period

Although Cape May was settled by the middle of the 17th century, there is no record of historic occupation of this property until 1870, when a lifesaving station was built on or near it. Many remains of shipwrecks have been reported in the area, and there may be some evidence of these in the beachfront portion of the property. There are no standing historic structures on this property. The Coast Guard facility was established in the late 1940's, and its buildings are typical modern construction.

Socioeconomic Environment

See **Socioeconomic Environment** section for Cape May Refuge.

Chapter 4. Management Direction

Refuge Management Policies and Guidelines

Compatibility Determinations

Federal law, regulation and policy provide the direction and planning framework to protect the National Wildlife Refuge System (Refuge System) from incompatible or harmful human activities and to insure that current and future Americans can enjoy Refuge System lands and waters. The National Wildlife Refuge System Administration Act of1966, as amended by the National Wildlife Refuge System Improvement Act of 1997 (Refuge Improvement Act), is the key legislation on managing public uses and compatibility.

Before activities or uses are allowed on a National Wildlife Refuge, the uses must be found to be a compatible use. A compatible use is a use, ...that will not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuge. Wildlife-dependent recreational uses may be authorized on a refuge when they are compatible and not inconsistent with public safety. Except for consideration of consistency with State laws and regulations as provided for in section (m), no other determinations or findings are required to be made by the refuge official under this Act or the Refuge Recreation Act for wildlife-dependent recreation to occur. (Refuge Improvement Act)

A number of compatibility determinations have been prepared over the years covering a variety of uses currently taking place on Cape May National Wildlife Refuge (Cape May Refuge). These compatibility determinations remain in effect and are being re-certified as part of this effort to prepare a Comprehensive Conservation Plan (CCP) for the Refuge.

Pre-acquisition Compatibility Determinations

A pre-acquisition compatibility determination assesses the compatibility of an existing priority general public use during the period from the time we first acquires a parcel of land to when a formal long-term management plan for the parcel is prepared and adopted. Pre-acquisition compatibility determinations for Cape May Refuge have been completed for the six priority general public uses of the System listed in the Refuge Improvement Act, hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation. (See Table 1on page 28.) The pre-acquisition compatibility determination for Cape May Refuge may be found in Appendix F. The Act defines these six priority general public uses as wildlife-dependent recreation and wildlife-dependent recreational use.

The pre-acquisition compatibility determinations for Cape May Refuge cover the existing priority general public uses occurring within the Land Protection Focus Areas (Focus Areas) described in this CCP. (See **Land Protection Focus Areas** on page 29, Map 2 on page 4, and Maps 3a and b beginning on page 43.) These Focus Areas are lands that have been added to the approved Refuge acquisition boundary.

Several of the six priority general public uses occur on lands within these Focus Areas. The current levels of hunting, fishing, wildlife observation and photography, environmental education and interpretation taking place on these lands do not seem to be negatively impacting fish, wildlife, or plant resources.

Current levels of the six priority general public uses occurring within these Focus Areas would be compatible with the mission of the Refuge System and the purposes for which Cape May Refuge was established. The Focus Areas have little estuarine habitat important to the Atlantic Brant, black ducks or rails, or important estuarine feeding and resting habitat for ducks or brant. The Refuge would allow the

Table 1. *Pre-acquisition Compatibility for Wildlife-dependent Recreational Activities at Cape May Refuge.*

Wildlife-dependent Recreational Activities	Existing Use?	Compatible Use?	Use Allowed?
Hunting	Yes	Yes	Yes
Fishing from bank	Yes	Yes	Yes
Fishing from boat	Yes	Yes	Yes
Wildlife Observation	Yes	Yes	Yes
Wildlife Photography	Yes	Yes	Yes
Environmental Education	No	Yes	Yes
Interpretation	No	Yes	Yes

current levels of hunting, fishing, wildlife observation and wildlife photography to continue in the interim. The Refuge will monitor impacts of these uses and adjust levels and locations as appropriate through the adoption of long-term management plans.

Walking, hiking and bicycling done for exercise and enjoyment of the outdoors occur on lands within these Focus Areas. To eliminate conflicts between user groups, the Refuge will terminate bicycling on property within the Focus Areas as soon as the Service acquired and posted a property within these areas. Walking and hiking would be allowed to continue at their current levels in the interim. We would monitor impacts of these uses and adjust levels and locations as appropriate through the adoption of long-term management plans.

All terrain vehicle (ATV), dirt bike, and mountain bike riding occurs on some lands in these Focus Areas. These activities negatively impact physical and biological resources, and are therefore not compatible with the purposes for which Cape May Refuge was established. To eliminate negative impacts, the Refuge will terminate these activities on property within the Focus Areas as soon as the Service acquired and posted a property within these areas.

Potential Land Protection Methods

The land protection efforts will be focused on lands adjacent to Service-owned lands within existing Refuge boundaries, and also to larger contiguous tracts. Funding for land acquisition will come from the Land and Water Conservation Fund and the Migratory Bird Conservation Fund. Known hazardous waste sites or contaminated areas will be excluded from consideration. All land transactions are subject to contaminant surveys.

The Service's land acquisition policy is to obtain the minimum interest necessary to satisfy Refuge objectives. Conservation easements can sometimes be used in this context, when they can be shown to be a cost-effective method of protection. In general, any conservation easement must preclude destruction or degradation of habitat, and allow Refuge staff to adequately manage uses of the area for the benefit of wildlife. Because development rights must be included, the cost of purchasing conservation easements often approaches that of fee title purchase, thus rendering this method less practical. Nevertheless, donations of easements or voluntary deed restrictions prohibiting habitat destruction would be encouraged. In addition, the Service could negotiate management agreements with local and State agencies, and accept conservation easements on upland tracts.

Land Acquisition Areas

The Service has identified 3,591 acres for acquisition to provide long-term protection to the numerous species of shorebirds, neotropical migratory land birds, waterfowl, long-legged waders, woodcock, raptors, finfish and shellfish, and threatened and endangered species that use Cape May Peninsula. (See Maps 3a and b beginning on page 43 and Appendix M on page 129.) Our objectives are to protect:

- Known sites of threatened or endangered species and communities;
- Areas important to the ecological health of lands already owned (ensure intact ecosystem processes, such as, protecting the quality and quantity of water for wetlands, providing habitat corridors between existing conservation lands, or sufficient size of contiguous areas to protect viable populations);
- Areas important for priority wildlife species (e.g., critical stopover habitat for migrating birds);
- Areas identified as priority sites for protection by other conservation organizations;
- Areas still viable for conservation protection (i.e., not already developed).

We will also work with interested agencies to identify additional areas needing protection and provide technical assistance if needed.

Property Taxes, Refuge Revenue Sharing, Relocation, and Landowner Rights

The Refuge Revenue Sharing Act of June 15, 1935, as amended, provides annual payments to taxing authorities, based on acreage and value of Refuge lands located within their jurisdiction. In 2003, the Service paid $132,957 to Cape May County communities.

Money for these payments comes from the sale of oil and gas leases, timber sales, grazing fees, and the sale of other Refuge System resources and from Congressional appropriations. The Congressional appropriations are intended to make up the difference between the net receipts from the Refuge Revenue Sharing Fund and the total amount due to local taxing authorities. The actual Refuge Revenue Sharing Payment does vary from year to year, because Congress may or may not appropriate sufficient funds to make full payment. The actual payments made in 2003 were 48.48% of full payment.

The Refuge Revenue Sharing Payments are based on one of three different formulas, whichever results in the highest payment to the local taxing authority. In New Jersey, the payments are based on three-quarters of one percent of the appraised fair market value. The purchase price of a property is considered its fair market value until the property is reappraised. The Service reappraises the value of Refuge lands every five years.

On wetlands and formerly farmland-assessed properties in New Jersey, the full entitlement Refuge Revenue Sharing Payments sometimes exceed the real estate tax. However, Refuge Revenue Sharing payments are more often less than the real estate tax.

The fact that Refuges put little demand on the infrastructure of a municipality, must be considered in assessing the financial impact on the municipality. For example, there is no extra demand placed on the school system, roads, utilities, police and fire protection, etc. There is a substantial body of literature that shows that development, especially residential development, actually costs a community more in schools, roads, sewers and other services than the tax revenue generated by the development (Land Trust Alliance, 1994).

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, provides certain relocation benefits to home owners, businessmen, and farm operators who are displaced as a result of Federal land acquisition. The law provides benefits to eligible owners and tenants for reimbursement of reasonable moving expenses, replacement of housing payments under certain conditions, relocation assistance services, and reimbursement of certain expenses incurred in selling real property to the Government.

The owner of land adjacent to Refuge land or within an approved Refuge acquisition boundary or a Refuge Focus Area, retains any and all the rights, privileges, and responsibilities of private land ownership. This includes the right of access, hunting, vehicle use, control of trespass, right to sell to any party, and the obligation to pay real estate taxes. The Refuge controls uses only on the properties it owns.

Ecosystem Services

Refuge lands provide substantial value to society through ecosystem services. These services (e.g., nutrient cycling, erosion control and sediment retention, water supply) represent benefits human populations derive, directly or indirectly, from ecosystem functions. Ecosystem services consist of the flow of material and energy from natural capital stocks (i.e., vegetation, minerals, the atmosphere) which combine with manufactured and human capital services to produce human welfare. Ecosystem services and the natural capital stocks that produce them are critical to the functioning of the earth s life support system. Appendix G lists 17 ecosystem services, the related ecosystem functions, and examples of how society benefits from them.

Accessibility

Cape May Refuge will operate its programs or activities so that when viewed in its entirety, it is readily accessible to and useable by disabled persons. The Rehabilitation Act of 1973, as amended, requires that programs and facilities be, to the highest degree feasible, readily accessible to and useable by all persons who have a disability.

Protection and Management of Cultural Resources

The Service has a legal responsibility to consider the effects its actions have on archeological and historic resources. In implementing this CCP, the Service will comply with Section 106 of the National Historic Preservation Act before conducting any ground disturbing activities. Compliance may require any or all of the following: State Historic Preservation Records survey, literature survey, or field survey.

The Comprehensive Conservation Plan

Cape May Refuge

Summary Statement

Under this CCP, staffing and funding levels at Cape May Refuge would be increased and the Refuge would initiate new wildlife population, habitat, and ecosystem management activities; provide new compatible wildlife-dependent recreational opportunities; increase land protection efforts; and construct new office and visitor facilities to support the goals and objectives of the Refuge.

The Service will seek to increase Refuge staffing and funding levels and initiate new wildlife population, habitat, and ecosystem management activities; provide new compatible wildlife-dependent recreational opportunities; increase land protection efforts; and construct new office and visitor facilities to support the goals and objectives of the Refuge.

The Refuge will place special emphasis on the six priority general public uses defined in the Refuge Improvement Act, i.e., hunting, fishing, wildlife observation and photography, environmental education and interpretation. Public use surveys, along with wildlife and habitat monitoring, will provide neccesary information in estimating the volume and impacts of public use, and in adapting the management strategies for that use.

Refuge Goals, Objectives and Strategies

This section presents long-term guidance for the Refuge in the form of goals, objectives and strategies. Refuge goals are qualitative statements that define what the Refuge must be to satisfy the Refuge purposes, legal mandates, and the needs of citizens and agencies having a vital interest in what and how the Refuge performs. These goals highlight specific elements of our vision statement which will be emphasized in future management. Objectives provide quantitative bench marks that indicate progress toward achieving Refuge purposes and goals. Strategies are specific actions or projects that will lead to the accomplishment of our objectives.

Goal 1. Protect and enhance Federal trust resources and other species and habitats of special concern.

Objective 1. Manage the Refuge to protect the swamp pink, a Federally listed threatened species.

Strategies

a. Protect and monitor the swamp pink.

b. Implement management techniques to improve habitat quality or increase population size or vigor.

Objective 2. Expand our threatened and endangered species efforts on the Refuge.

Strategies

a. Survey all Refuge lands for currently and potentially occurring threatened and endangered species (Federal and State-listed).

b. Protect and manage newly discovered occurrences to maintain or expand those populations.

c. Conduct a feasibility assessment for sites where a species does not currently occur, but could potentially be restored. Attempt to restore species at sites with a reasonable chance of success.

Objective 3. Inventory, map and monitor Refuge wildlife and habitats.

Strategies

a. Conduct comprehensive baseline flora and fauna surveys of plants, invertebrates, fish, amphibians, reptiles, birds, and mammals.

b. From the baseline surveys (including song bird point counts, frog call surveys, and Monitoring Avian Production Survivorship banding stations), establish a long-term monitoring program (e.g., sample a group for five years, every 15 years).

c. Implement species monitoring before and after major habitat management projects, and expand use of Geography Information Systems (GIS) to document and model species and habitat.

d. Develop a computer archive of data and publications to ensure access to information for staff, partners, and the public.

e. Use the results of baseline surveys, project evaluation surveys, and monitoring to develop, evaluate, and revise management objectives for wildlife populations, habitat, and public use.

f. Encourage research not only by identifying needs, but in co-developing research proposals and pursuing funding through Service and non-Service sources. New research would include the:

- impact of mosquito control techniques, such as pesticide applications and Open Marsh Water Management (OMWM), on habitat and wildlife;
- impact of different kinds and levels of public use on habitat and wildlife;
- impact of public use on the dynamics of beach and shoreline environment;
- impact of watershed development on water quality/quantity and wetland resources;
- impact of restoring pre-colonial ecology of the southern New Jersey coastal landscape (e.g., role of fire, plant and animal community composition);
- assessment of ecological integrity of the landscape based upon proposed land protection and management.

g. Conduct a Wilderness Review of all Refuge by 2010 to determine if any Refuge lands should be recommended for designation as part of the National Wilderness Preservation System.

Objective 4. Expand efforts to protect and enhance other species and habitats of special concern.

Strategies

a. Provide technical assistance to local communities and partners, on wildlife-related issues (e.g., wildlife and habitat monitoring; contaminant spill planning/response).

b. Initiate efforts to restore colonial nesting birds. Initiate research, if necessary, to determine limiting factors to successful restoration of bird colonies.

c. Initiate efforts to identify and manage critical habitat on the Refuge for interjurisdictional fish. This would be covered in a step-down Wildlife Population Management Plan.

d. Provide public trapping opportunities for raccoon, fox, muskrat, coyote and beaver, under Refuge special use permits, on Refuge lands north of Highway 550. (See Map 4 on page 45.)

Goal 2. Maintain and/or restore natural ecological communities to promote healthy, functioning ecosystems.

Objective 1. Complete a step-down Habitat Management Plan for the Refuge by 2005.

Strategies

a. Use existing preliminary habitat prescriptions for all currently owned Refuge lands as the basis for the step-down plan. These prescriptions were developed to provide habitat management objectives that characterize a desired physiognomic condition (major vegetative structure, e.g., forest, grassland, brush, marsh) and hydrologic regime (e.g., upland, tidal wetland, non-tidal wetland). (See Maps 5a and b beginning on page 46.)

b. Consider habitat requirements for endangered or other high priority trust resources (e.g., piping plover) and ecological communities with special emphasis (e.g., Atlantic white cedar swamps) in establishing site specific prescriptions.

c. Implement the following guiding principles in developing specific habitat prescriptions:

- restore salt marshes to pre-grid-ditched hydrology;
- maximize grasslands or fields for open land character;
- maximize forests for interior character;
- maintain scrub/shrub between forest and grassland to create soft boundaries;
- buffer sensitive areas;
- use only native plant species and local genotypes in restoration projects;
- favor low maintenance habitat strategies, taking advantage of driving systems processes;

- use pre-colonial baseline to define native species, community composition, and landscape configuration;

- use natural regeneration to convert or restore habitat types, unless there are no seed sources, there are threats from exotic species, or physical stabilization is required.

d. Develop and implement a private lands habitat restoration plan in cooperation with other agencies and organizations that have private lands programs, such as the Service s Ecological Services Division, and the U.S. Department of Agriculture s Natural Resource Conservation Service and Forest Service.

Objective 2. Manage 4,090 acres for Upland Forest by maintaining 3,775 acres of existing Upland Forest, converting 238 acres of Upland Brush and 56 acres of Crop-Pasture to regrow, and restoring 21 acres of Developed Land.

Objective 3. Maintain 2,346 acres as Wetland Forests. Additional research may indicate the need to restore Atlantic White Cedar in current Wetland Forest sites.

Objective 4. Maintain 1,345 acres as Salt Marsh.

Objective 5. Maintain 343 acres as Wetland/Bog Brush, generally in a complex with Cedar Swamp Forests.

Objective 6. Manage 167 acres as Grassland habitat (native grasses and forbs) by restoring five acres of Developed Land, 159 acres of Crop-Pasture, two acres of Upland Forest, and one acre of Upland Brush. Actively restore areas currently covered with grasses and forbs that are dominated by exotic and invasive species to native species.

Objective 7. Manage 104 acres of early succession Brushy Uplands by maintaining 11 acres in a brushy state through the use of mechanical or fire techniques, converting 71 acres of Crop-Pasture, Sand-Gravel Pit or Developed Land to brush by allowing it to regrow, and setting back 22 acres of Upland Forest to a brushy state.

Objective 8. Maintain 61 acres as Open Fresh Water, with a priority to remove any fish passage obstructions. Monitor non-Refuge navigable waters for water quality and fish and wildlife use in cooperation with the State.

Objective 9. Maintain 25 of existing Fresh Non-tidal Marsh.

Objective 10. Maintain or convert 37 acres to Dune-Beach habitat, the actual acreage will vary based on the highly dynamic shoreline changes. Restore five acres of Developed Land and four acres of Brush Upland to Dune-Beach habitat.

Objective 11. Allow eight acres of Upland Brush to succeed into Forest Island habitat in salt marshes and bays of the estuary.

Objective 12. Maintain 402 acres of as Cedar Swamp Forest and restore seven acres of Sand-Gravel Pit to Cedar Swamp Forest habitat.

Objective 13. One acre associated with offices and other Refuge facilities would remain Developed Land. Landscape this area with native plants and maintain it to support Refuge activities and reduce negative impacts on wildlife.

Objective 14. Complete revision of step-down Fire Management Plan and Burn Prescriptions in 2001 and apply prescribed fire to all of the upland habitats. (Note: The step-down Fire Management was completed and approved in May 2003.)

Strategies

a. Upland Forest - burn once every 8-15 years to reduce hazardous fuel, overstory stand density, understory density, increase heath or grass/forb density, and control invasive species.

b. Upland Brush - burn once every 5-15 years to reduce hazardous fuel, set back succession, and control invasive species.

c. Grassland - burn once every 1-3 years to reduce hazardous fuel, set back succession (woody growth), and control invasive species.

d. Refine burn frequency and prescriptions through research and monitoring.

Objective 15. Develop and implement an Integrated Pest Management (IPM) program with control strategies for phragmites and other exotic plant species by 2005.

Strategies

a. Survey invasive and exotic species on the Refuge.

b. Establish a monitoring program, in concert with habitat monitoring, to assess progress and identify additional problem species.

c. Research alternative methods of controlling certain species.

d. Offer technical assistance and support to restoration and control efforts on nearby public and private lands.

Objective 16. Reduce use of pesticides on the Refuge.

Strategies

a. Continue current reliance on Open Marsh Water Management on the Refuge to control mosquitos. No pesticides have been used on the Refuge for the past five years.

b. Complete renegotiation of the Cooperative Agreement with county mosquito control agencies and the State regarding mosquito control activities on the Refuge. Continue current mosquito control efforts on the Refuge until further planning prescribes other actions.

c. Aggressively pursue alternatives to pesticide use.

d. Offer technical assistance on IPM strategies to local communities for controlling common problem species.

Goal 3. Establish a land protection program to support species, habitat and ecosystem goals.

Objective 1. Acquire the remaining 10,175 acres of privately owned land within the currently approved 21,200 acre Refuge acquisition boundary. (See Maps 3a and b beginning on page 43.)

Strategies

a. Continue buying from willing sellers and focus our land acquisition efforts on developable upland properties first.

b. Obtain the $4.56 million in funding needed to acquire the remaining 7,600 acres of land within the approved Refuge acquisition area (average cost of $600 per acre). (The average annual Land and Water Conservation appropriation for this Refuge, based on the five-year period, FY-1995/1999, is $1,200,000.)

c. Maintain present level of participation in off-Refuge land use planning efforts with governmental and private partners (e.g., the Migratory Bird Stopover Project).

Objective 2. Work to protect 3,591 acres of wildlife habitat essential to the long-term ecological integrity of the Refuge. (See Map 2 on page 4, Maps 3a and b beginning on page 43, and Appendix M on page 135.)

Strategies

a. Acquire 3,591 acres, which were defined in cooperation with the State, local municipalities and our conservation partners.

b. Continue our policy of working with willing sellers.

c. Obtain the $8.6 million in funding needed to acquire all 3,591 acres (average cost of $2,400 per acre). (This would require increasing the average annual Land and Water Conservation Fund appropriation for the Refuge by about $550,000 for the next fifteen years. For the five-year period, FY-1995/1999, the average annual Land and Water Conservation funding for the Refuge was about $1.2 million.)

d. Expand our land planning efforts with municipalities, counties, and the State.

e. Expand our efforts to work with public and private landowners to implement wildlife habitat protection and restoration off Service-owned land.

f. Seek to acquire the Coast Guard's LORAN Support Unit (adjacent to the Two Mile Beach Unit), should it become excess to its needs, and the adjacent 17-acre privately owned parcel. (See Map 2 on page 4.) (Note: An additional 18 acre parcel of wetland habitat joining the Two Mile Beach Unit was purchased in August 2003 as part of the Unit.)

Goal 4. Provide opportunities for high-quality compatible, wildlife-dependent public use.

Objective 1. Continue to provide compatible big game hunting opportunities on the Refuge. (See Maps 6a and b beginning on page 48.)

Strategies

a. Continue to open almost all of the Refuge for all six of New Jersey's deer seasons, subject to Refuge and State regulations.

b. Continue to keep the two closed areas in Middle Township closed to all public uses.

c. Reduce big game hunting activities if we determine that incompatible levels of use are occurring.

Objective 2. Provide new compatible upland game hunting opportunities on the Refuge by 2002. (See Maps 7a and b beginning on page 50.)

Strategies

a. Initiate the Refuge's first upland game hunting opportunities on selected areas of the Refuge.

- Open Refuge lands west of Highway 47 in the Delaware Bay Division for hunting gray squirrel and cottontail rabbit.

- Open Refuge lands north of Highway 550 in the Great Cedar Swamp Division for hunting gray squirrel, cottontail rabbit, and turkey.

b. Weigh the following factors in expanding upland game hunting opportunities:

- the size and configuration of new Refuge-owned properties;

- the availability of public access;

- safety considerations including the State mandated 450-foot safety zone around buildings and playgrounds.

c. Reduce upland game hunting activities if the Refuge determines that incompatible levels of use are occurring.

Objective 3. Continue to provide compatible migratory bird hunting opportunities on the Refuge. (See Maps 8a and b beginning on page 52.)

Strategies

a. Continue to allow migratory game bird hunting west of NJ Route 47 in the Delaware Bay Division.

Objective 4. Expand compatible migratory bird hunting opportunities on the Refuge by 2002. (See Maps 8a and b beginning on page 52.)

Strategies

a. Open all lands north of County Route 550 in the Great Cedar Swamp Division to migratory game bird hunting, according to State and Refuge regulations.

b. Weigh the following factors in expanding migratory game bird hunting opportunities:

- the size and configuration of new Refuge-owned properties;

- the availability of public access;

- safety considerations including the State mandated 450-foot safety zone around buildings and playgrounds.

c. Reduce migratory game bird hunting activities if we determine that incompatible levels of use are occurring.

Objective 5. Open the entire Refuge to compatible fishing and crabbing by 2002, so as to simplify the regulations and provide maximum opportunities for the public to fish.

Strategies

a. These activities are functionally limited to just a few freshwater ponds and various tidally influenced creeks.

b. Reduce fishing and crabbing activities if the Refuge determines that incompatible levels of use are occurring.

Objective 6. Continue to provide compatible wildlife observation and photography opportunities on the Refuge. (See maps 9a and b beginning on page 54.)

Strategies

a. Continue to provide Refuge-wide opportunities for wildlife observation and interpretation, including those provided on the Woodcock Trail.

Objective 7. Expand compatible wildlife observation and photography opportunities on the Refuge. (See Maps 9a and b beginning on page 54.)

Strategies

a. Make the following planned improvements to ensure that the Refuge is much more accessible and enjoyable to the visitor:

- a universally accessible trail with a rolled and compacted surface of stone dust and numerous benches at the Refuge headquarters;
- a parking lot and kiosk in the area of Gracetown Road/Woodbine Blvd. in Dennis Township in conjunction with the proposed 35-mile trail on the former railroad bed running from Cape May to Manumuskin, Cumberland County. A portion of this trail would run through the Refuge. This trail would be open to hiking, bicycling, and horseback riding;
- improved hiking trails into the adjacent cedar swamp;
- a canoe landing and designated canoe route on Cedar Creek in Upper Township, to provide opportunities for wildlife observation in areas otherwise difficult to access;
- parking lots, kiosks, and other trail improvements at Peach Orchard Road in Upper Township, and the Stocker and Schellinger tracts in Middle Township, similar to what has already been done at the Woodcock Trail.

b. Reduce wildlife observation and photography activities if the Refuge determines that incompatible levels of use are occurring.

Objective 8. Continue to provide compatible environmental education and interpretation opportunities on and off the Refuge. (See maps 9a and b beginning on page 54.)

Strategies

a. Continue to maintain interpretive signs and distribute Refuge brochures at existing public use sites.

Objective 9. Expand compatible environmental education and interpretation opportunities both on and off the Refuge. (See maps 9a and b beginning on page 54.)

Strategies

a. Increase the Refuge's participation in local special events, and efforts to reach non-traditional audiences.

b. Place numerous interpretive signs along Refuge trails and in kiosks, some of which would be periodically changed to describe seasonal events, such as the spring shorebird/horseshoe crab phenomenon on Delaware Bay.

c. Schedule nature walks regularly, especially with the assistance of volunteers and partner organizations.

d. Produce a variety of Refuge brochures, maps, and fact sheets, highlighting Refuge programs and natural resources, Delaware Bay, and the south Jersey shore.

e. Develop teacher workshops and establish an outdoor classroom on the Refuge.

f. Establish a Friends Group and set up a Refuge Web site.

g. Reduce environmental education and interpretation activities if the Refuge determines that incompatible levels of use are occurring.

Objective 10. Expand our resource protection and visitor safety efforts on the Refuge.

Strategies

a. Hire one additional full-time and one additional seasonal Park Rangers to better protect resources and visitors.

Objective 11. Provide new headquarters and visitor facilities on the Refuge.

Strategies

a. Construct a new, larger office and visitor contact building at the Kimbles Beach Road headquarters site, along with a new storage building and maintenance building.

The Two Mile Beach Unit

Summary Statement

Under this CCP we would initiate a seasonal closure of the beach, above and below the mean high tide line, to benefit:

- beach nesting birds such as piping plover, least tern, and black skimmer;
- migratory shorebirds during spring and fall migration periods.

The closure would take place from April 1 to September 30, during which time, beach access would be allowed only during Refuge-scheduled bird/beach walks. This seasonal closure would be evaluated after two years to determine its effectiveness and to implement changes if necessary.

Motor vehicles, and non-wildlife dependent uses such as swimming, sunbathing and surfing would be prohibited at all times. We would evaluate the compatibility of surfing from October through March. The beach would be open for walking and surf fishing from October through March, accessible from the north boundary of the beach and at the location of the viewing platforms. Sand dunes would be closed to public access except at designated crossing points.

A visitor center would be established in building A-14 and environmental education and interpretation programs would be provided on a regular basis. We would also use building B-6 for Refuge administration, and all other buildings or improvements on the property would be removed, except those required for the Coast Guard LORAN Support Unit.

Goal 1. Protect and enhance Federal trust resources and other species and habitats of special concern.

Objective 1. Develop and implement a management plan for beach nesting birds and migrant shorebirds, including managing predators, and other techniques employed to attract and benefit beach nesting birds.

Strategies

a. Continue management actions to protect and enhance beach-nesting birds, especially Federal and State-listed endangered and threatened species.

- Annually close beach to public access from April 1st to September30th.
- Manage furbearer populations through a Refuge trapping program, but do not allow public trapping.

Objective 2. Inventory, map and monitor all species and habitats.

Strategies

a. Initiate a comprehensive wildlife inventory program, including bird abundance and distribution surveys, as well as surveys for reptiles, amphibians, small mammals, and invertebrates.

b. Study and monitor beach and sand dune dynamics.

c. Conduct vegetation surveys and mapping to refine habitat management activities.

d. Utilize and incorporate GIS in all surveys and studies.

e. Initiate a cooperative agreement to provide technical assistance for habitat management and wildlife surveys on Coast Guard lands at the Loran Support Unit and Training Center.

Goal 2. Maintain and/or restore natural ecological communities to promote healthy, functioning ecosystems.

Objective 1. Complete and implement a step-down Habitat Management Plan for the Unit by 2006, as part of the Refuge Plan.

Strategies

a. Emphasize stopover habitat for migratory birds, management for endangered species, and restoration of the Dune-Beach and Salt Marsh habitat types.

b. Remove buildings and restore disturbed areas by planting native vegetation. (Note: All buildings, except for the planned visitor contact/office facility, and two maintenance facilities, were demolished and habitat restored in 2002.)

c. Restore other disturbed areas using native vegetation.

d. Consider planting, prescribed burning, mowing, control of exotic or invasive species, or modifying the dune/beach structure in managing the Unit's habitats.

Objective 2. Develop and implement an Integrated Pest Management (IPM) program for the Unit by 2006, as part of the Refuge program.

Strategies

a. Survey invasive species.

b. Consider mechanical, biological, and chemical control of phragmites, mosquitos, and other invasive species.

Objective 3. Reduce use of pesticides on the Unit.

Strategies

a. Consider mechanical, biological, and chemical control of undesirable species, including phragmites and mosquitos.

Goal 3. Establish a land protection program to support of species, habitat and ecosystem goals.

Objective 1. Acquire appropriate adjacent lands as they become available. (See Map 2 on page 4.)

Strategies

a. Continue our policy of buying from willing sellers.

b. Seek to acquire the Coast Guard s LORAN Support Unit (adjacent to the Two Mile Beach Unit), should it become excess to its need, and the adjacent 17-acre privately owned tract, both of which are within the Focus Areas. (Note: An additional 18 acre parcel of wetland habitat joining the Two Mile Beach Unit was purchased in August 2003 as part of the Unit.)

Goal 4. Provide opportunities for high-quality compatible, wildlife-dependent public use.

Objective 1. Provide compatible fishing opportunities on the Unit.

Strategies

a. Offer seasonal surf fishing opportunities, when beach is open for public access from October 1 through March 31st.

b. Allow walk-in access only; no motor vehicles use on the beach.

c. Reduce fishing activities if the Refuge determines that incompatible levels of use are occurring.

Objective 2. Provide compatible opportunities for wildlife observation and photography on the Unit.

Strategies

a. Offer wildlife observation and photography opportunities on specific roads and trails.

b. Offer wildlife observation and photography opportunities on the beach from October through March.

c. Maintain selected trails and roads with improvements to provide visitors a quality experience, including signs, kiosks, universally accessible trails, and platforms.

d. Establish a wildlife observation platform, possibly utilizing the existing former radar platform.

e. Reduce wildlife observation and photography activities if the Refuge determines that incompatible levels of use are occurring.

Objective 3. Provide compatible environmental education and interpretation opportunities on the Unit.

Strategies

a. Take an active role in environmental education and interpretation.

b. Establish a visitor center, with displays, exhibits, and regular programs, in building A-14 by 2004, operated by Refuge staff and volunteers.

c. Provide regular programs and guided nature walks, especially during peak bird migration periods.

d. Have cooperating partners provide additional opportunities and programs.

e. Install various self-guiding interpretive signs and kiosks.

f. Reduce environmental education and interpretation activities if the Refuge determines that incompatible levels of use are occurring.

Objective 4. Remove all unnecessary buildings and structural improvements on the Unit located within the 100-year floodplain by 2007, in compliance with Executive Order 11988, Flood Plain Management. (Note: All buildings, except for the planned visitor contact/office facility, and two maintenance facilities, were demolished and habitat restored in 2002.)

Strategies

a. Use existing Buildings A-14 and B-6 and any other improvements necessary for Refuge maintenance, storage, law enforcement, administration, etc.

b. Renovate Building A-14, a new 5,000 square foot structure, to accommodate a visitor center, with displays, exhibits, and regular programs, and some office space by 2004.

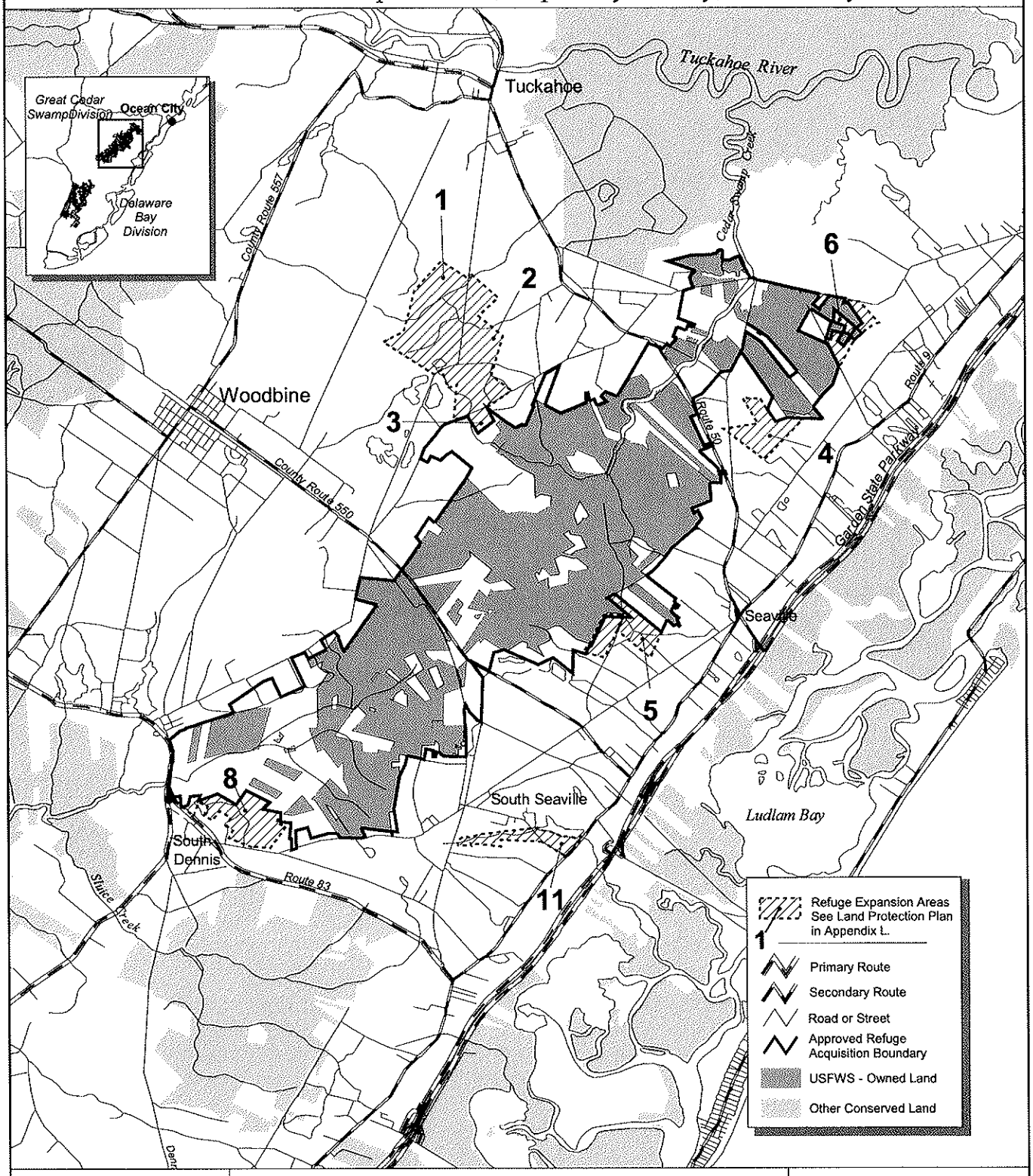
c. Remove all other buildings or improvements on the property, except those which must be maintained to assure continued utilities access for the Coast Guard LORAN Support Unit.

d. Explore the beneficial use of rubble resulting from the demolition of buildings and structures.

Refuge Expansion Areas

Cape May National Wildlife Refuge, Group A

Great Cedar Swamp Division, Cape May County, New Jersey



Data Sources:
USGS - 1:100,000 roads & hydro.
New Jersey - other protected land.
USFWS - refuge boundaries & other refuge information.

Map prepared for Jersey Coast Refuges Comprehensive Conservation Plan, August 2002.
This map is for planning purposes only.

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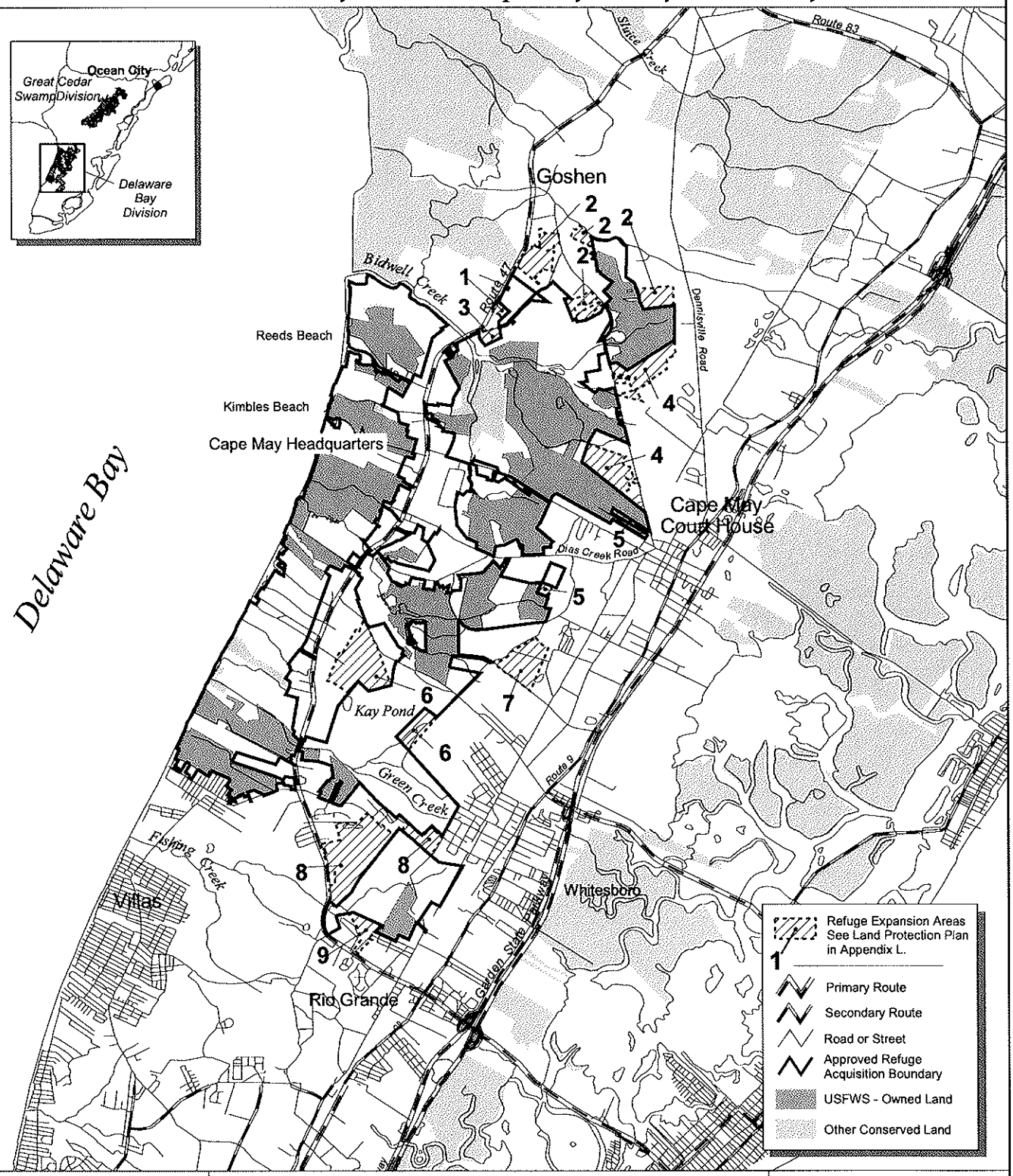
0 1 2 3 4 5 Kilometers

N

Refuge Expansion Areas

Cape May National Wildlife Refuge, Group B

Delaware Bay Division, Cape May County, New Jersey



Data Sources:
USGS - 1:100,000 roads & hydro.
New Jersey - other protected land.
USFWS - refuge boundaries & other refuge information.

Map prepared for Jersey Coast Refuges Comprehensive Conservation Plan, August 2002.
This map is for planning purposes only.

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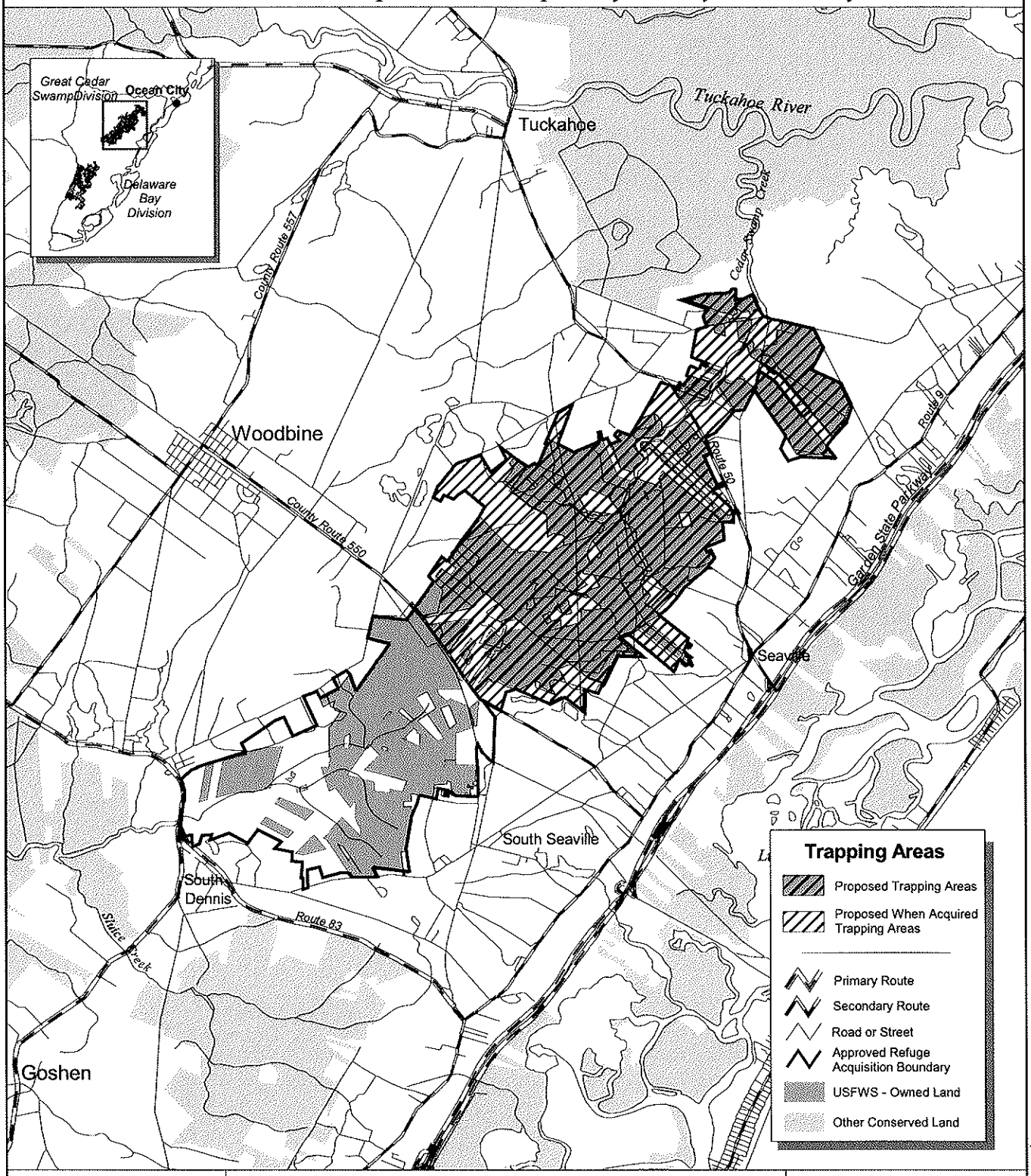
0 1 2 3 4 5 Kilometers

N

Trapping Areas

Cape May National Wildlife Refuge

Great Cedar Swamp Division, Cape May County, New Jersey



Data Sources:
USGS - 1:100,000 roads & hydro.
New Jersey - other protected land.
USFWS - refuge boundaries & other refuge information.

Map prepared for Jersey Coast Refuges Comprehensive Conservation Plan, January 2001.
This map is for planning purposes only.

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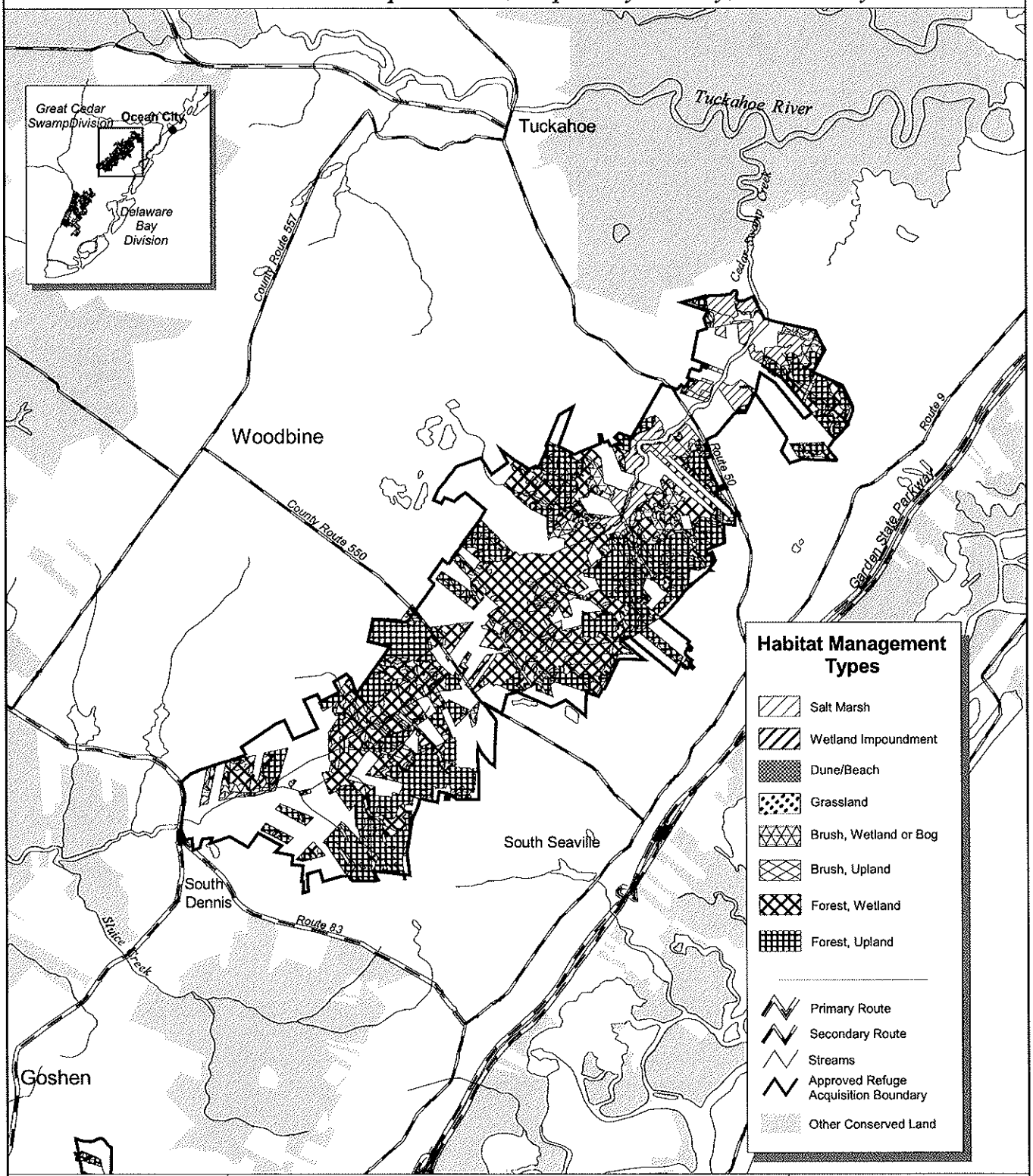
Map 5a

Habitat Management

Cape May National Wildlife Refuge

Great Cedar Swamp Division, Cape May County, New Jersey



Data Sources:
USGS - 1:100,000 roads & hydro.
New Jersey - other protected land.
USFWS - refuge boundaries & other refuge information.

Map prepared for Jersey Coast Refuges Comprehensive Conservation Plan, January 2001.
This map is for planning purposes only.

0 1 2 3 4 Miles

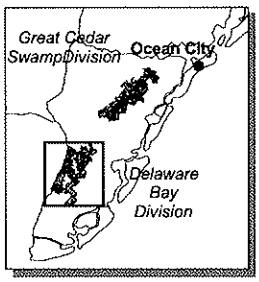
0 1 2 3 4 5 Kilometers

N

Habitat Management

Cape May National Wildlife Refuge

Delaware Bay Division, Cape May County, New Jersey



Goshen
Bidwell Creek
Route 47
Reeds Beach
Kimbles Beach
Cape May Headquarters
Delaware Bay
Dennisville Road
Cape May Court House
Dias Creek Road
Kay Pond
Green Creek
Fishing Creek
Villas
Rio Grande
Route 9
Garden State Parkway
Whitesboro
Shunce Creek
Route 83

Habitat Management Types

- Salt Marsh
- Wetland Impoundment
- Dune/Beach
- Grassland
- Brush, Wetland or Bog
- Brush, Upland
- Forest, Wetland
- Forest, Upland

- Primary Route
- Secondary Route
- Streams
- Approved Refuge Acquisition Boundary
- Other Conserved Land

Data Sources:
USGS - 1:100,000 roads & hydro.
New Jersey - other protected land.
USFWS - refuge boundaries & other refuge information.

Map prepared for Jersey Coast Refuges Comprehensive Conservation Plan, January 2001.
This map is for planning purposes only.

0 1 2 3 4 Miles

0 1 2 3 4 5 Kilometers

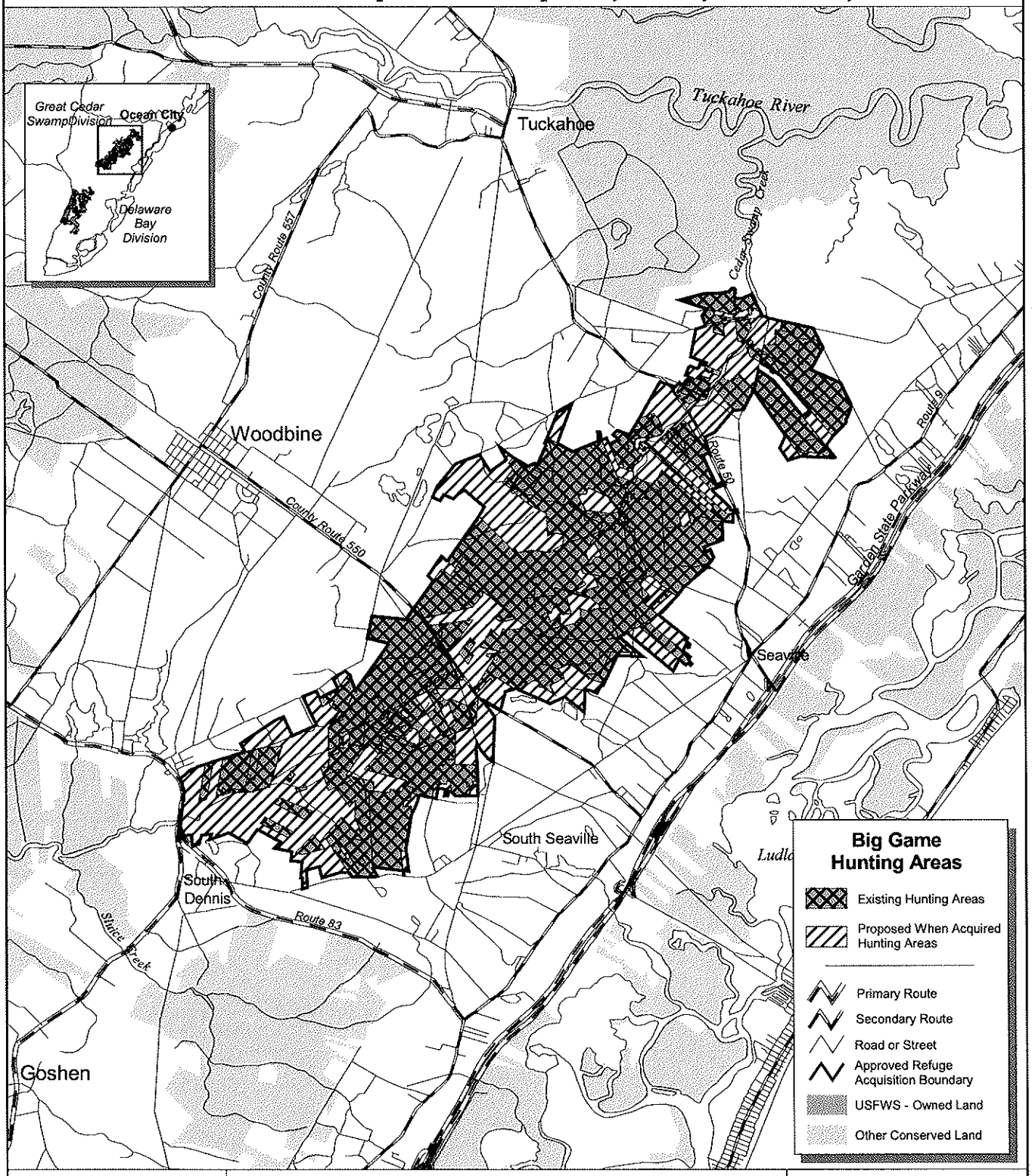
N

Map 6a

Big Game Hunting Areas

Cape May National Wildlife Refuge

Great Cedar Swamp Division, Cape May County, New Jersey



Data Sources:
USGS - 1:100,000 roads & hydro.
New Jersey - other protected land.
USFWS - refuge boundaries & other refuge information.

Map prepared for Jersey Coast Refuges Comprehensive Conservation Plan, January 2001.
This map is for planning purposes only.

0 1 2 3 4 Miles

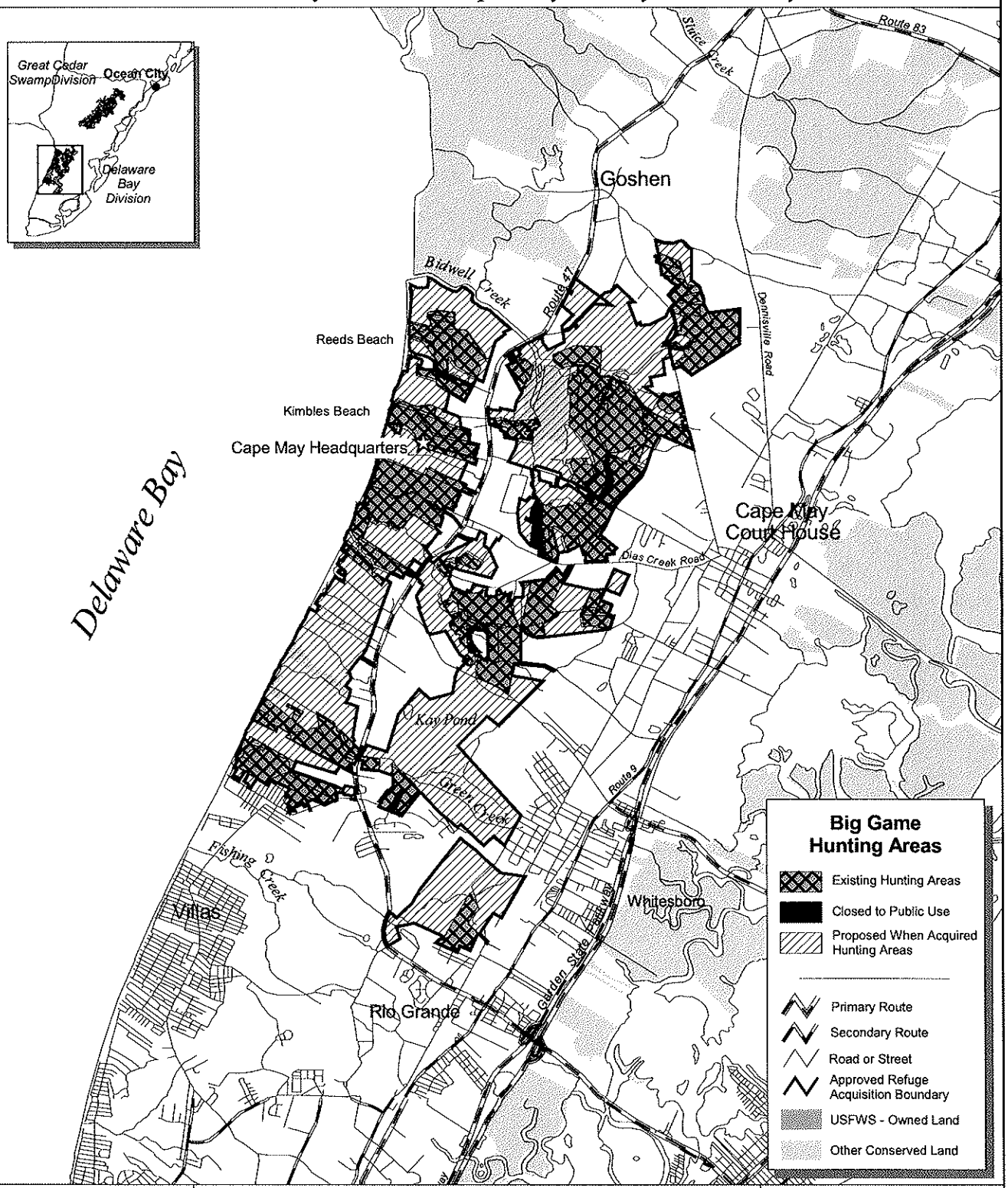
0 1 2 3 4 5 Kilometers

N

Big Game Hunting Areas

Cape May National Wildlife Refuge

Delaware Bay Division, Cape May County, New Jersey



Data Sources:
USGS - 1:100,000 roads & hydro.
New Jersey - other protected land.
USFWS - refuge boundaries & other refuge information.

Map prepared for Jersey Coast Refuges Comprehensive Conservation Plan, January 2001.
This map is for planning purposes only.

0 1 2 3 4 Miles

0 1 2 3 4 5 Kilometers

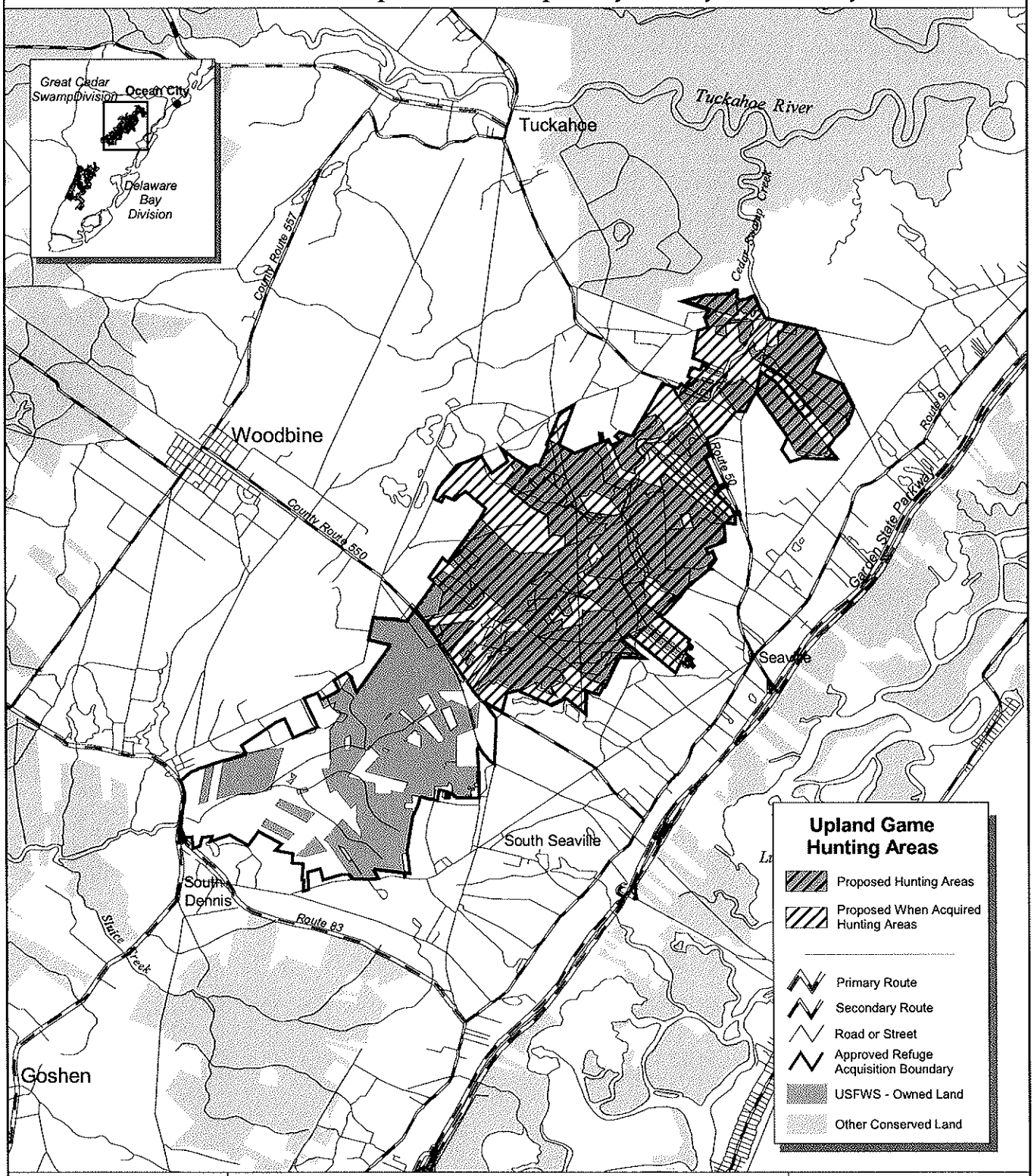
N

Map 7a

Upland Game Hunting Areas

Cape May National Wildlife Refuge

Great Cedar Swamp Division, Cape May County, New Jersey



Data Sources:
USGS - 1:100,000 roads & hydro.
New Jersey - other protected land.
USFWS - refuge boundaries & other refuge information.

Map prepared for Jersey Coast Refuges Comprehensive Conservation Plan, January 2001.
This map is for planning purposes only.

0 1 2 3 4 Miles

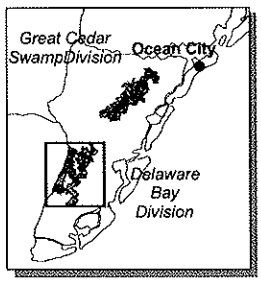
0 1 2 3 4 5 Kilometers

N

Upland Game Hunting Areas

Cape May National Wildlife Refuge

Delaware Bay Division, Cape May County, New Jersey



Goshen
Reeds Beach
Kimbles Beach
Cape May Headquarters
Cape May Court House
Delaware Bay
Villas
Rio Grande
Whitesboro
Kay Pond
Green Creek
Fishing Creek
Bidwell Creek
Dias Creek Road
Dennisville Road
Route 47
Route 9
Route 83
Garden State Parkway
Stites Creek

Upland Game Hunting Areas

- Proposed Hunting Areas
- Proposed When Acquired Hunting Areas
- Primary Route
- Secondary Route
- Road or Street
- Approved Refuge Acquisition Boundary
- USFWS - Owned Land
- Other Conserved Land

Data Sources:
USGS - 1:100,000 roads & hydro.
New Jersey - other protected land.
USFWS - refuge boundaries & other refuge information.

Map prepared for Jersey Coast Refuges Comprehensive Conservation Plan, January 2001.
This map is for planning purposes only.

0 1 2 3 4 Miles

0 1 2 3 4 5 Kilometers

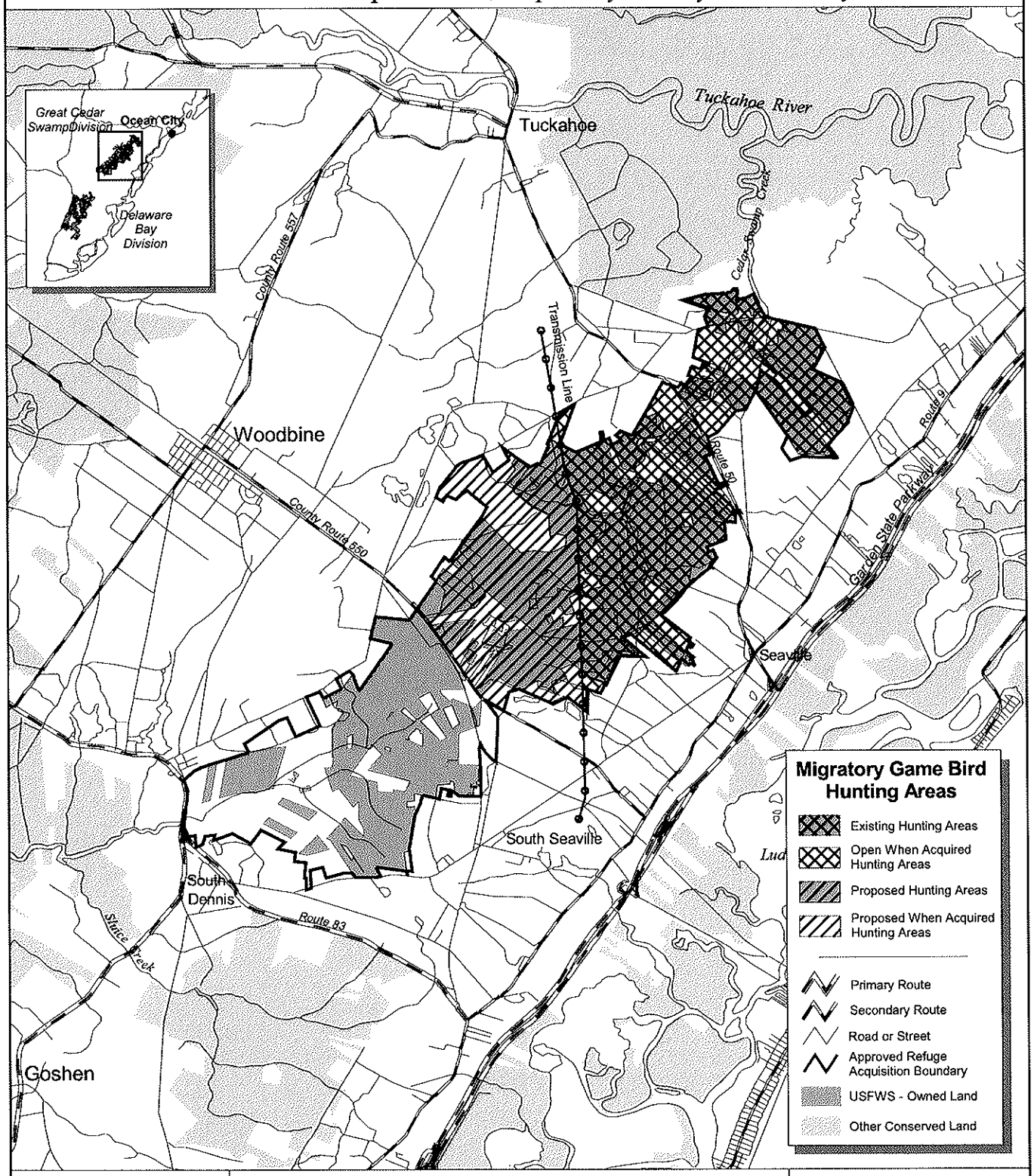
N

Map 8a

Migratory Game Bird Hunting Areas

Cape May National Wildlife Refuge

Great Cedar Swamp Division, Cape May County, New Jersey



Data Sources:
USGS - 1:100,000 roads & hydro.
New Jersey - other protected land.
USFWS - refuge boundaries & other refuge information.

Map prepared for Jersey Coast Refuges Comprehensive Conservation Plan, March 2000.
This map is for planning purposes only.

0 1 2 3 4 Miles

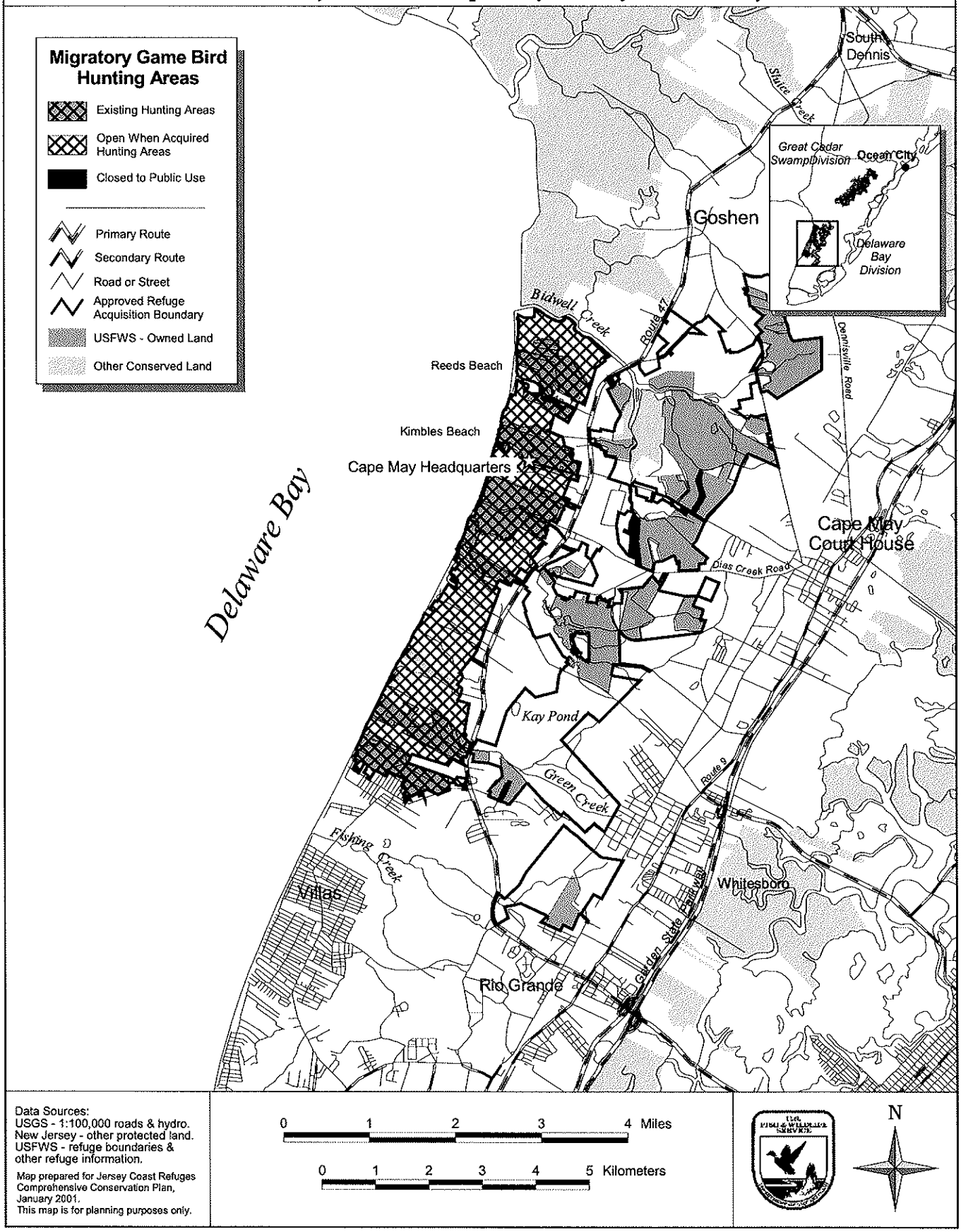
0 1 2 3 4 5 Kilometers

N

Migratory Game Bird Hunting Areas

Cape May National Wildlife Refuge

Delaware Bay Division, Cape May County, New Jersey



Data Sources:
USGS - 1:100,000 roads & hydro.
New Jersey - other protected land.
USFWS - refuge boundaries & other refuge information.

Map prepared for Jersey Coast Refuges Comprehensive Conservation Plan, January 2001.
This map is for planning purposes only.

0 1 2 3 4 Miles

0 1 2 3 4 5 Kilometers

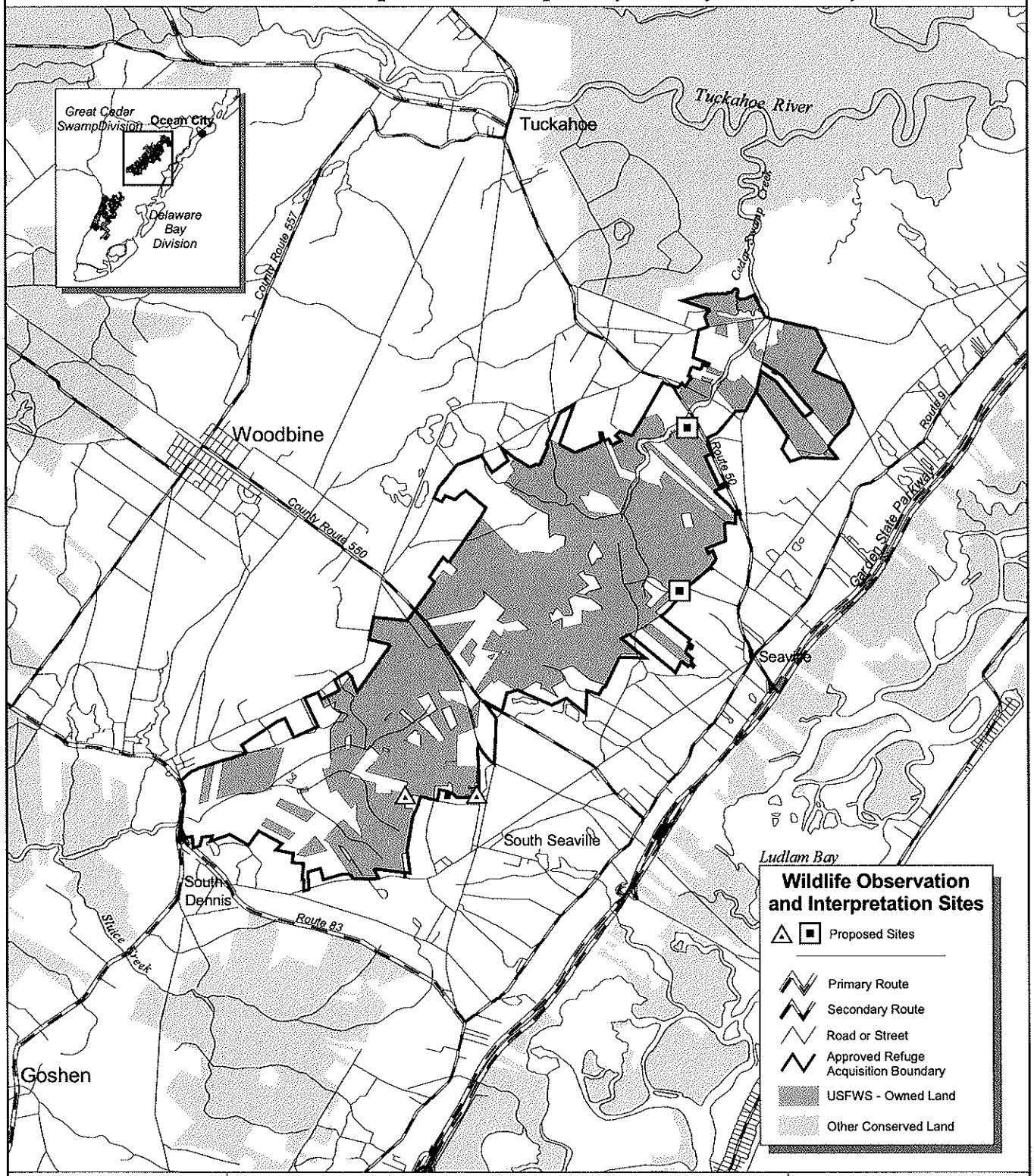
N

Map 9a

Wildlife Observation & Interpretation Sites

Cape May National Wildlife Refuge

Great Cedar Swamp Division, Cape May County, New Jersey



Data Sources:
USGS - 1:100,000 roads & hydro.
New Jersey - other protected land.
USFWS - refuge boundaries & other refuge information.

Map prepared for Jersey Coast Refuges Comprehensive Conservation Plan, January 2001.
This map is for planning purposes only.

0 1 2 3 4 Miles

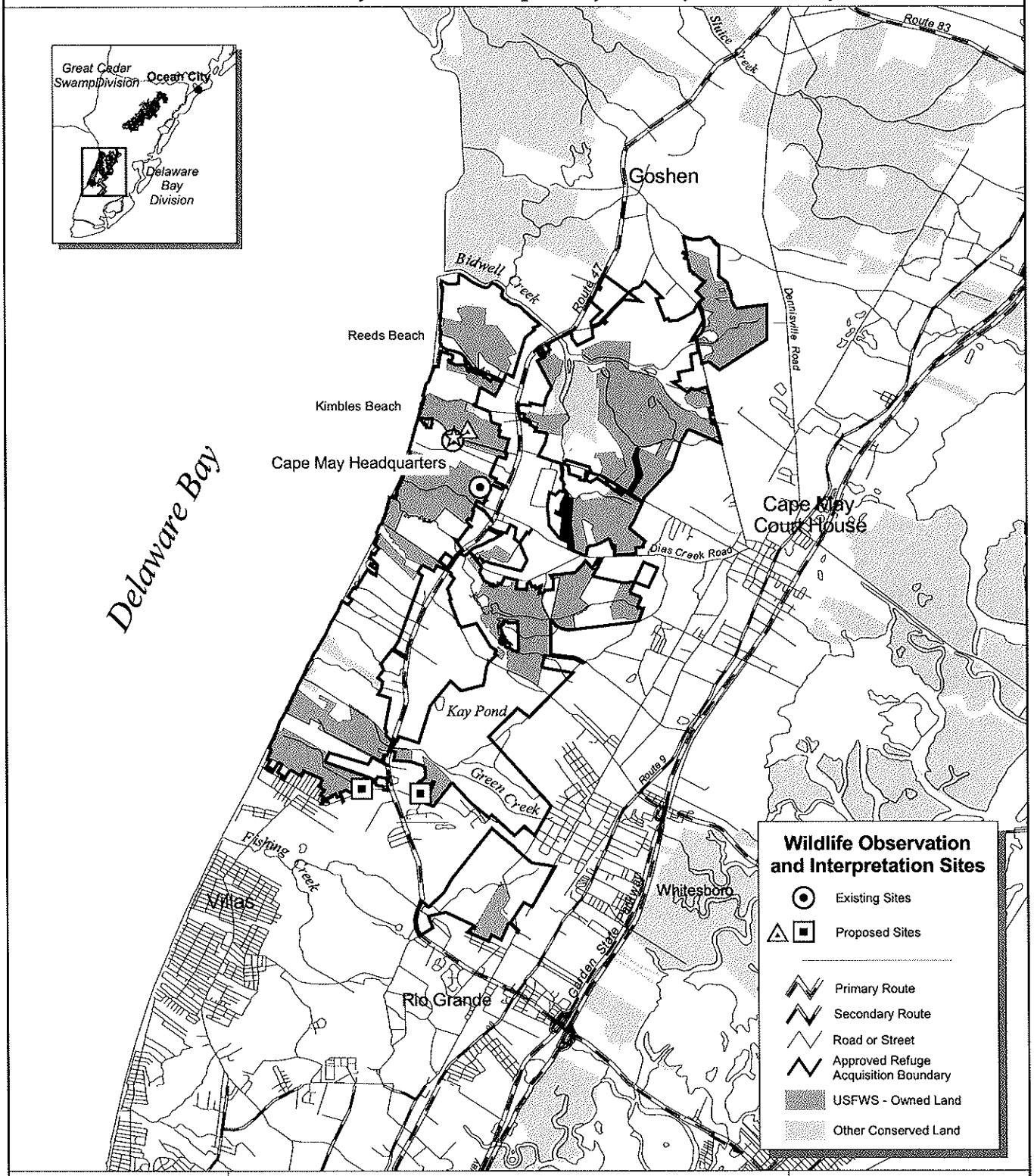
0 1 2 3 4 5 Kilometers

N

Wildlife Observation & Interpretation Sites

Cape May National Wildlife Refuge

Delaware Bay Division, Cape May County, New Jersey



Data Sources:
USGS - 1:100,000 roads & hydro.
New Jersey - other protected land.
USFWS - refuge boundaries & other refuge information.

Map prepared for Jersey Coast Refuges Comprehensive Conservation Plan, January 2001.
This map is for planning purposes only.

0 1 2 3 4 Miles

0 1 2 3 4 5 Kilometers

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Chapter 5. Implementation and Monitoring

Funding and Staffing

A staff of four full time equivalents (FTEs) currently operates Cape May Refuge. This includes:

- Refuge Manager;
- Deputy Refuge Manager;
- Wildlife Biologist;
- Park Ranger.

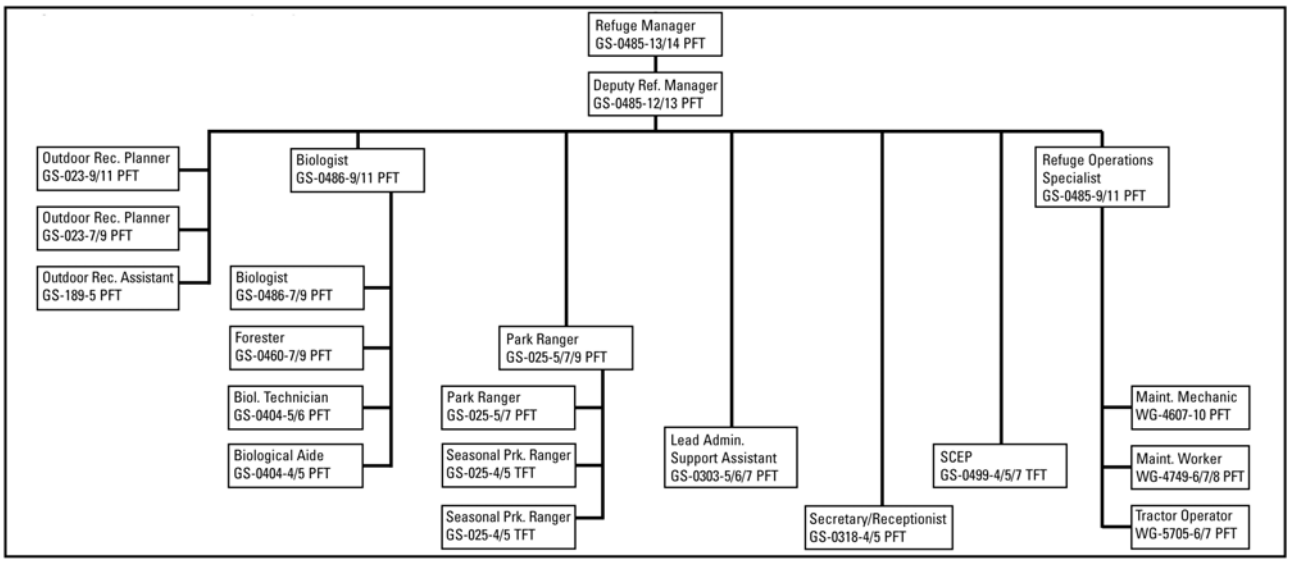
To fully implement the extensive program of wildlife conservation and compatible wildlife-dependent recreation found in this CCP, a staffing plan of 21 FTEs will be required (see Figure 2). This staffing plan, together with funding for our land protection efforts, will allow us to achieve the objectives and strategies set forth in this CCP. Full funding of the CCP over the next 15 years will require;

- $6.5 million for staffing and projects;
- $12.8 million for land protection.

Projects required to implement the CCP are listed in the Appendices. Appendix H contains the Refuge Operation Needs System (RONS) which documents requests to Congress for funding and staffing needed to carry out projects above the existing base budget. Amounts shown include a start-up cost for the first year, the recurring cost for following years, and a 15-year total cost. Staffing is shown in FTEs (one FTE is one person working full time for one year). Appendix I contains the Maintenance Management System (MMS) which documents the equipment, buildings, and other existing property that require repair or replacement.

The rate at which the Refuge achieves its full potential of contributing locally, regionally, and nationally to wildlife conservation and providing opportunities for compatible wildlife-dependent recreation is totally dependent upon receiving adequate funding and staffing.

Figure 2. Staffing plan for Cape May Refuge



Step-down Management Plans

Step-down management planning is the formulation of detailed plans for meeting goals and objectives identified in the CCP. These plans describe the specific strategies and implementation schedules we are to follow, "stepping down" from general goals and objectives. They may be addressed in detail during preparation of the CCP, or prepared following completion of the CCP. The preparation of new step-down management plans or substantial changes to existing plans typically require further National Environmental Policy Act (NEPA) compliance and an opportunity for public review.

The Refuge System Manual, Part 4, Chapter 3, lists over 25 specific management plans that are generally required on every Refuge. Some plans require annual revisions, others are on a 5 to 10 year revision schedule.

The following step-down management plans have been revised, or are currently in process of being revised:

- Fire Management Plan (completed 2003);
- Habitat Management Plan (to be completed in 2005).

The following step-down management plans are either in need of revision or do not exist:

- Wildlife Population Management Plan, including trapping (scheduled for 2003);
- Integrated Pest Management Plan, including chapters for each problem species (scheduled for 2003);
- Priority Wildlife-Dependent Recreation Plan, including hunting and fishing (scheduled for 2001), wildlife observation and photography (scheduled for 2002), environmental education and interpretation (scheduled for 2002).

Monitoring and Adaptive Management

This CCP covers a 15-year period, through 2018. Periodic review of the CCP will be required to ensure that established goals and objectives are being met and that the Plan is being implemented as scheduled. To assist this review process, a monitoring and evaluation program will be implemented, focusing on issues involving public use activities, and wildlife habitat and population management.

Monitoring of public use programs would involve the continued collection and compilation of visitation figures and activity levels. In addition, research and monitoring programs will be established to assess the impacts of public use activities on wildlife and wildlife habitat, conflicts between Refuge users, and identify compatible levels of public use activities. We will reduce these activities if we determine that incompatible levels of public use were occurring.

Collection of baseline data on all wildlife populations and habitats will be implemented. This data will update existing records of wildlife species using the Refuge, their habitat requirements, and seasonal use patterns. This data will also be used to evaluate the effects of public use and habitat management programs on wildlife populations.

Refuge habitat management programs will be continually monitored for positive and negative impacts on wildlife habitat and populations and the ecological integrity of the ecosystem, and to determine if these

management activities are helping to meet Refuge goals and objectives. Information resulting from monitoring will allow staff to set more specific and better management objectives, more rigorously evaluate management objectives, and ultimately, make better management decisions.

Plan Amendment and Revision

Periodic review of the CCP will be required to ensure that objectives are being met and strategies are being implemented. Ongoing monitoring and evaluation will be an important part of this process.

The Plan will be reviewed annually to determine the need for revision. A revision would occur if significant new information were to become available, ecological conditions changed, major Refuge expansion occurs, or we identify the need to do so during Plan review. This should occur every 15 years or sooner, if necessary. Revisions to the Plan will be subject to additional NEPA compliance and an opportunity for public review and comment.

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Appendices

A. Relevant Legal Mandates.
B. Summarized Public Comments, July 1999.
C. Summarized Public Comments, July 2000.
D. NEPA Compliance.
E. Species of Concern.
F. Pre-acquisition Compatibility Determinations.
G. Ecosystem Values.
H. RONS Project List.
I. MMS Project list.
J. Glossary.
K. Works Cited.
L. List of Preparers.

Appendix A

Relevant Legal Mandates and Land Acquisition Legislation

Emergency Wetland Resources Act of 1986

This Act authorized the purchase of wetlands from Land and Water Conservation Fund moneys, removing a prior prohibition on such acquisitions. The Act also requires the Secretary to establish a National Wetlands Priority Conservation Plan, requires the States to include wetlands in their Comprehensive Outdoor Recreation Plans, and transfers to the Migratory Bird Conservation Fund amount equal to import duties on arms and ammunition.

Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended

Public Law 93-205, approved December 28, 1973, repealed the Endangered Species Conservation Act of December 5, 1969 (P.L. 91-135, 83 Stat. 275). The 1969 act had amended the Endangered Species Preservation Act of October 15, 1966 (P.L. 89-669, 80 Stat. 926). The 1973 Endangered Species Act provided for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife, and plants depend, both through Federal action and by encouraging the establishment of State programs. The Act:

- Authorizes the determination and listing of species as endangered and threatened;
- Prohibits unauthorized taking, possession, sale, and transport of endangered species;
- Provides authority to acquire land for the conservation of listed species, using land and water conservation funds;
- Authorizes establishment of cooperative agreements and grants-in-aid to States that establish and maintain active and adequate programs for endangered and threatened wildlife and plants;
- Authorizes the assessment of civil and criminal penalties for violating the Act or regulations;
- Authorizes the payment of rewards to anyone furnishing information leading to arrest and conviction for any violation of the Act of any regulation issued thereunder.

Environmental Education Act of 1990 (20 U.S.C. 5501-5510; 104 Stat. 3325)

Public Law 101-619, signed November 16, 1990, established the Office of Environmental Education within the Environmental Protection Agency to develop and administer a Federal environmental education program.

Responsibilities of the Office include developing and supporting programs to improve understanding of the natural and developed environment, and the relationships between humans and their environment; supporting the dissemination of educational materials; developing and supporting training programs and environmental education seminars; managing a Federal grant program; and administering an environmental internship and fellowship program. The Office is required to develop and support environmental programs in consultation with other Federal natural resource management agencies, including the Fish and Wildlife Service.

Executive Order 11988, Floodplain Management

The purpose of this Executive Order, signed May 24, 1977, is to prevent Federal agencies from contributing to the "adverse impacts associated with occupancy and modification of floodplains" and the "direct or indirect support of floodplain development." In the course of fulfilling their respective authorities, Federal agencies "shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains.

Fish and Wildlife Improvement Act of 1978 (16 U.S.C. 7421, 92 Stat. 3110)

This act was passed to improve the administration of fish and wildlife programs and amends several earlier laws, including the Refuge Recreation Act, the National Wildlife Refuge Administration Act, and the Fish and Wildlife Act of 1956. It authorizes the Secretary to accept gifts and bequests of real and personal property on behalf of the United States. It also authorizes the use of volunteers on Service projects and appropriations to carry out volunteer programs.

Historic Preservation Acts

There are various laws for the preservation of historic sites and objects.

Antiquities Act *(16 U.S.C. 431 - 433):* The Act of June 8, 1906, (34 Stat. 225) authorizes the President to designate as National Monuments objects or areas of historic or scientific interest on lands owned or controlled by the United States. The Act required that a permit be obtained for examination of ruins, excavation of archaeological sites and the gathering of objects of antiquity on lands under the jurisdiction of the Secretaries of Interior, Agriculture, and Army, and provided penalties for violations.

Archaeological Resources Protection Act *(16 U.S.C. 470aa - 470ll):* Public Law 96-95, approved October 31, 1979, (93 Stat. 721) largely supplanted the resource protection provisions of the Antiquities Act for archaeological items.

This Act established detailed requirements for issuance of permits for any excavation for or removal of archaeological resources from Federal or Indian lands. It also established civil and criminal penalties for the unauthorized excavation, removal, or damage of any such resources; for any trafficking in such resources removed from Federal or Indian land in violation of any provision of Federal law; and for interstate and foreign commerce in such resources acquired, transported or received in violation of any State or local law.

Public Law 100-588, approved November 3, 1988, (102 Stat. 2983) lowered the threshold value of artifacts triggering the felony provisions of the Act from $5,000 to $500, made attempting to commit an action prohibited by the Act a violation, and required the land managing agencies to establish public awareness programs regarding the value of archaeological resources to the Nation.

Archeological and Historic Preservation Act *(16 U.S.C. 469-469c):* Public Law 86-523, approved June 27, 1960, (74 Stat. 220) as amended by Public Law 93-291, approved May 24, 1974, (88 Stat. 174) to carry out the policy established by the Historic Sites Act (see below), directed Federal agencies to notify the Secretary of the Interior whenever they find a Federal or Federally assisted, licensed or permitted project may cause loss or destruction of significant scientific, prehistoric or archaeologic data. The Act authorized use of appropriated, donated and/or transferred funds for the recovery, protection and preservation of such data.

Historic Sites, Buildings and Antiquities Act *(16 U.S.C. 461-462, 464-467):* The Act of August 21, 1935, (49 Stat. 666) popularly known as the Historic Sites Act, as amended by Public Law 89-249, approved October 9, 1965, (79 Stat. 971) declared it a national policy to preserve historic sites and objects of national significance,

including those located on refuges. It provided procedures for designation, acquisition, administration and protection of such sites. Among other things, National Historic and Natural Landmarks are designated under authority of this Act. As of January, 1989, 31 national wildlife refuges contained such sites.

National Historic Preservation Act *of 1966 (16 U.S.C. 470-470b, 470c-470n):* Public Law 89-665, approved October 15, 1966, (80 Stat. 915) and repeatedly amended, provided for preservation of significant historical features (buildings, objects and sites) through a grant-in-aid program to the States. It established a National Register of Historic Places and a program of matching grants under the existing National Trust for Historic Preservation (16 U.S.C. 468-468d).

The Act established an Advisory Council on Historic Preservation, which was made a permanent independent agency in Public Law 94-422, approved September 28, 1976 (90 Stat. 1319). That Act also created the Historic Preservation Fund. Federal agencies are directed to take into account the effects of their actions on items or sites listed or eligible for listing in the National Register.

As of January, 1989, 91 historic sites on national wildlife refuges have been placed on the National Register.

Land and Water Conservation Fund Act of 1964

Public law 88-578, approved Sept. 3, 1964 (78 Stat. 897) provides funding through receipts from the sale of surplus federal land, appropriations from oil and gas receipts from the outer continental shelf, and other sources of for land acquisition under several authorities. Appropriations from the fund may be used for matching grants to states for outdoor recreation projects and for land acquisition by various federal agencies, including the Fish and Wildlife Service.

Migratory Bird Conservation Act of 1929 (16 U.S.C. 715-715d, 715e,715f-715r)

This Act established the Migratory Bird Conservation Commission which consists of the Secretaries of the Interior (chairman), Agriculture, and Transportation, two members from the House of Representatives, and an ex-officio member from the state in which a project is located. The Commission approves acquisition of land and water, or interests therein, and sets the priorities for acquisition of lands by the Secretary for sanctuaries or for other management purposes. Under this Act, to acquire lands, or interests therein, the state concerned must consent to such acquisition by legislation. Such legislation has been enacted by most states.

Migratory Bird Hunting and Conservation Stamp Act (16 U.S.C. 718-718j, 48 Stat. 452), as amended

The "Duck Stamp Act," as this March 16, 1934, authority is commonly called, requires each waterfowl hunter 16 years of age or older to possess a valid Federal hunting stamp. Receipts from the sale of the stamp are deposited in a special Treasury account known as the Migratory Bird Conservation Fund and are not subject to appropriations.

National and Community Service Act of 1990 (42 U.S.C. 12401; 104 Stat. 3127)

Public Law 101-610, signed November 16, 1990, authorizes several programs to engage citizens of the U.S. in full- and/or part-time projects designed to combat illiteracy and poverty, provide job skills, enhance educational skills, and fulfill environmental needs. Several provisions are of particular interest to the U.S. Fish and Wildlife Service.

American Conservation and Youth Service Corps – As a Federal grant program established under Subtitle C of the law, the Corps offers an opportunity for young adults between the ages of 16-25, or in the

case of summer programs, 15-21, to engage in approved human and natural resources projects which benefit the public or are carried out on Federal or Indian lands.

To be eligible for assistance, natural resources programs will focus on improvement of wildlife habitat and recreational areas, fish culture, fishery assistance, erosion, wetlands protection, pollution control and similar projects. A stipend of not more than 100 percent of the poverty level will be paid to participants. A Commission established to administer the Youth Service Corps will make grants to States, the Secretaries of Agriculture and Interior and the Director of ACTION to carry out these responsibilities.

National and Community Service Act – Will make grants to States for the creation of full-time and/or part-time programs for citizens over 17 years of age. Programs must be designed to fill unmet educational, human, environmental, and public safety needs. Initially, participants will receive post-employment benefits of up to $1000 per year for part-time and $2500 for full-time participants.

Thousand Points of Light – Creates a non-profit Points of Light Foundation to administer programs to encourage citizens and institutions to volunteer in order to solve critical social issues, and to discover new leaders and develop institutions committed to serving others.

National Environmental Policy Act of 1969 (P.L. 91-190, 42 U.S.C. 4321-4347, January 1, 1970, 83 Stat. 852) as amended by P.L. 94-52, July 3, 1975, 89 Stat. 258, and P.L. 94-83, August 9, 1975, 89 Stat. 424).

Title I of the 1969 National Environmental Policy Act (NEPA) requires that all Federal agencies prepare detailed environmental impact statements for "every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment."

The 1969 statute stipulated the factors to be considered in environmental impact statements, and required that Federal agencies employ an interdisciplinary approach in related decision-making and develop means to ensure that unquantified environmental values are given appropriate consideration, along with economic and technical considerations.

Title II of this statute requires annual reports on environmental quality from the President to the Congress, and established a Council on Environmental Quality in the Executive Office of the President with specific duties and functions.

National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee) as amended

This Act defines the National Wildlife Refuge System as including wildlife refuges, areas for protection and conservation of fish and wildlife which are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, and waterfowl production areas. The Secretary is authorized to permit any use of an area provided such use is compatible with the major purposes for which such area was established. The purchase consideration for rights-of-way go into the Migratory Bird Conservation Fund for the acquisition of lands. By regulation, up to 40% of an area acquired for a migratory bird sanctuary may be opened to migratory bird hunting unless the Secretary finds that the taking of any species of migratory game birds in more than 40% of such area would be beneficial to the species. The Act requires an Act of Congress for the divestiture of lands in the system, except (1) lands acquired with Migratory Bird Conservation Commission funds, and (2) lands can be removed from the system by land exchange, or if brought into the system by a cooperative agreement, then pursuant to the terms of the agreement.

National Wildlife Refuge System Improvement Act of 1997

Public Law 105-57, amends the National Wildlife System Act of 1966 (16 U.S.C. 668dd-ee), providing guidance for management and public use of the Refuge System. The Act mandates that the Refuge System be consistently directed and managed as a national system of lands and waters devoted to wildlife conservation and management.

The Act establishes priorities for recreational uses of the Refuge System. Six wildlife-dependent uses are specifically named in the Act: hunting, fishing, wildlife observation and photography, and environmental education and interpretation. These activities are to be promoted on the Refuge System, while all non-wildlife dependant uses are subject to compatibility determinations. A compatible use is one which, in the sound professional judgement of the Refuge Manger, will not materially interfere with or detract from fulfillment of the Refuge System Mission or refuge purpose(s).

As stated in the Act, "The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans."

The Act also requires development of a comprehensive conservation plan for each refuge and management of each refuge consistent with the plan. When writing CCP, planning for expanded or new refuges, and when making management decisions, the Act requires effective coordination with other Federal agencies, state fish and wildlife or conservation agencies, and refuge neighbors. A refuge must also provide opportunities for public involvement when making a compatibility determination or developing a CCP.

North American Wetlands Conservation Act (103 Stat. 1968; 16 U.S.C. 4401-4412)

Public Law 101-233, enacted December 13, 1989, provides funding and administrative direction for implementation of the North American Waterfowl Management Plan and the Tripartite Agreement on wetlands between Canada, U.S. and Mexico.

The Act converts the Pittman-Robertson account into a trust fund, with the interest available without appropriation through the year 2006 to carry out the programs authorized by the Act, along with an authorization for annual appropriation of $15 million plus an amount equal to the fines and forfeitures collected under the Migratory Bird Treaty Act.

Available funds may be expended, upon approval of the Migratory Bird Conservation Commission, for payment of not to exceed 50 percent of the United States share of the cost of wetlands conservation projects in Canada, Mexico, or the United States (or 100 percent of the cost of projects on Federal lands). At least 50 percent and no more than 70 percent of the funds received are to go to Canada and Mexico each year.

Public Law 98-293 - approved May 22, 1984 (98. Stat. 207)

Renamed the Brigantine National Wildlife Refuge and Barnegat National Wildlife Refuge, collectively, as the Edwin B. Forsythe National Wildlife Refuge, in memory of the late Congressman Forsythe of New jersey, ranking member of the House Merchant Marine and Fisheries Committee for many years.

Refuge Recreation Act of 1962 (16 U.S.C. 460k-460k-4, 76 Stat. 653)

This Act authorizes the Secretary of the Interior to administer refuges, hatcheries, and other conservation areas for recreational use, when such uses do not interfere with the area's primary purposes. It authorizes construction and maintenance of recreational facilities and the acquisition of land for incidental fish and

wildlife oriented recreational development or protection of natural resources. It also authorizes the charging of fees for public uses.

Refuge Revenue Sharing Act (16 U.S.C. 715s)

Section 401 of the Act of June 15, 1935, (49 Stat. 383) provided for payments to counties in lieu of taxes, using revenues derived from the sale of products from refuges.

Public Law 88-523, approved August 30, 1964, (78 Stat. 701) made major revisions by requiring that all revenues received from refuge products, such as animals, timber and minerals, or from leases or other privileges, be deposited in a special Treasury account and net receipts distributed to counties for public schools and roads.

Public Law 93-509, approved December 3, 1974, (88 Stat. 1603) required that moneys remaining in the fund after payments be transferred to the Migratory Bird Conservation Fund for land acquisition under provisions of the Migratory Bird Conservation Act.

Public Law 95-469, approved October 17, 1978, (92 Stat. 1319) expanded the revenue sharing system to include National Fish Hatcheries and Service research stations. It also included in the Refuge Revenue Sharing Fund receipts from the sale of salmonid carcasses. Payments to counties were established as:

1) on acquired land, the greatest amount calculated on the basis of 75 cents per acre, three-fourths of one percent of the appraised value, or 25 percent of the net receipts produced from the land; and

2) on land withdrawn from the public domain, 25 percent of net receipts and basic payments under Public Law 94-565 (31 U.S.C. 1601-1607, 90 Stat. 2662), payment in lieu of taxes on public lands.

This amendment also authorized appropriations to make up any difference between the amount in the Fund and the amount scheduled for payment in any year. The stipulation that payments be used for schools and roads was removed, but counties were required to pass payments along to other units of local government within the county which suffer losses in revenues due to the establishment of Service areas.

Rehabilitation Act of 1973 (29 U.S.C. 794)as amended

Title 5 of P.L. 93-112 (87 Stat. 355), signed October 1, 1973, prohibits discrimination on the basis of handicap under any program or activity receiving Federal financial assistance.

Transfer of Certain Real Property for Wildlife Conservation purposes Act of 1948

This Act provides that upon determination by the Administrator of the General Services Administration, real property no longer needed by a Federal agency can be transferred, without reimbursement, to the Secretary of the Interior if the land has particular value for migratory birds, or to a State agency for other wildlife conservation purposes.

Wilderness Act of 1964 (16 U.S.C. 1131-1136, 78 Stat. 890)

Public Law 88-577, approved September 3, 1964, directed the Secretary of the Interior, within 10 years, to review every roadless area of 5,000 or more acres and every roadless island (regardless of size) within National Wildlife Refuge and National Park Systems for inclusion in the National Wilderness Preservation System.

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Appendix B

Summary of Public Comments Received on the Draft CCP/EA and Their Disposition

The draft CCP/EA was released for 45 days of public review and comment in June 1999. Over 170 people attended the three public meetings held in July at the following location: Middle Township Building in Cape May County; Galloway Township Library in Atlantic County; and Stafford Township Municipal Building in Ocean County. We also received over 1,600 individual comment letters. There were a great many duplicate comments received, since many people sent copies to both the Forsythe Refuge headquarters in Oceanville, New Jersey and our Regional Office in Hadley, Massachusetts. A summary of the public comments received and the disposition of the concerns expressed in those comments for the Cape May Refuge follows.

Comment: Many commenters requested that both Forsythe and Cape May Refuges provide more environmental education opportunities and improve public access by providing additional interpretive trails. They also requested that additional user-friendly maps and signs be placed throughout the Refuges.

Response: We agree. In Alternative B, our Proposed Action in the Revised Draft CCP/EA, we have substantially expanded our environmental education offerings and increased the amount of interpretation that we would provide, including additional interpretative trails and signage.

Comment: Many commenters requested that at-large or Refuge-wide hunting be allowed at both Forsythe and Cape May Refuges in all areas deemed appropriate. They were concerned about the diminishing number of areas around the Refuges that provided hunting opportunities for the public. In particular, several people requested that upland game hunting opportunities be provided. They referenced the National Wildlife Refuge System Improvement Act of 1997, which includes hunting as one of six wildlife-dependent priority public uses of the Refuge System that should be given priority consideration over other uses of the refuges. A few people commented that hunting was not an appropriate use on a National Wildlife Refuge.

Response: In response to the concerns of these commenters, we added a third alternative, Alternative C, in the Revised Draft CCP/EA. This Alternative would provide opportunities for Refuge-wide hunting at both Refuges. At Forsythe we would expand deer hunting opportunities by including the State fall and winter bow and regular six-day firearms seasons, and open most of the Refuge to both upland game and migratory game bird hunting. At Cape May we would provide opportunities for upland game and migratory game bird hunting Refuge-wide. The entire Refuge is already open for deer hunting. Additional opportunities for hunting would also be provided on newly acquired lands at both Refuges.

Alternative B, our Proposed Action in the revised Draft CCP/EA, while not providing Refuge-wide hunting, would significantly increase hunting opportunities at both Refuges. At Forsythe we would expand the area currently opened to permit deer hunting and initiate a universally accessible permit deer hunt, initiate upland game hunting in the Oak Island Unit of the Brigantine Division, and expand the area open to migratory game bird hunting. At Cape May we would open about 45% of the Refuge to upland game hunting and expand the current migratory game bird hunting area into that same 45% of the Refuge. The entire Refuge is already open for deer hunting. Additional opportunities for hunting would also be provided on newly acquired lands at both Refuges.

While hunting must be given priority consideration over other public uses, it does not take priority over the other five wildlife-dependent priority public uses (fishing, wildlife observation and photography, environmental education and interpretation) identified in the Improvement Act. We believe that Alternative B, our Proposed Action in the Revised Draft CCP/EA, would help us best achieve Refuge purposes, vision and goals; fulfill the Refuge System mission; maintain and, where appropriate, restore the biological integrity, diversity and environmental health of both Refuges and the System; address the key issues and mandates; and is consistent with the principles of sound fish and wildlife management.

Comment: The State of New Jersey, Division of Fish and Wildlife, requested that additional acreage within both Forsythe and Cape May Refuges be opened up to provide opportunities for hunting. They believed the Service's safety concerns could be addressed by requiring that all hunters be in compliance with State fish and game regulations.

Response: Alternative B, our Proposed Action in the Revised Draft CCP/EA, would significantly increase hunting opportunities at both Refuges. At Forsythe we would expand the area currently opened to permit deer hunting and initiate a universally accessible permit deer hunt, initiate upland game hunting in the Oak Island Unit of the Brigantine Division, and expand the area open to migratory game bird hunting. At Cape May we would open about 45% of the Refuge to upland game hunting and expand the current migratory game bird hunting area into that same 45% of the Refuge. The entire Refuge is already open for deer hunting. Additional opportunities for hunting would also be provided on newly acquired lands at both Refuges.

Comment: Other commenters requested additional trapping opportunities at both Forsythe and Cape May Refuges. They identified trapping as a necessary and important wildlife management tool.

Response: We agree that trapping is an important wildlife management tool. It is often used on refuges to control predators and to manage populations of small mammals that impact refuge habitats and facilities such as dikes. Alternative B, our Proposed Action in the Revised Draft CCP/EA, includes additional opportunities for trapping at both Forysthe and Cape May Refuges. At Forsythe we would expand the areas open to trapping and at Cape May we would open about 25% of the Refuge to trapping of muskrat, raccoon and fox.

Comment: Many commenters supported our land protection proposals and wanted us to continue to acquire additional properties located near or around both Forsythe and Cape May Refuges. They supported our efforts to both increase habitat protection and provide additional public use opportunities.

Response: Under Alternative B, our Proposed Action in the Revised Draft CCP/EA, we would acquire 12,300 acres of privately owned lands within our currently approved acquisition boundaries at Forsythe Refuge, and 7,600 acres of privately owned lands within our currently approved acquisition boundaries at Cape May Refuge. We also have identified 17,000 acres of focus areas at Forsythe Refuge, 11,500 acres of which we are proposing to acquire, and 4,900 acres of focus areas at Cape May Refuge, 3,600 acres of which we are proposing to acquire. These lands are located outside our current approved Refuge acquisition boundaries and represent lands with habitats that are important to a number of federal trust species. They also encompass watersheds that are important to protect from future development to ensure that we have adequate water quantity and quality for Refuge wetlands and provide habitat corridors for the movement of wildlife between various state, local and federal conservation lands.

Comment: Several commenters thought that the proposed two-year beach closure during the nesting season at the new Two Mile Beach Unit was unnecessary. They were concerned that the closure threatened their long-standing use of the beach, including being able to walk the beach to reach Cape May Inlet. Several suggested that fencing could be placed above the mean high tide line as a protective measure and that the proposed beach closure should only be enforced if birds actually began to nest at the site.

Response: In light of our mandates as a Federal Land Management Agency, we believe it is important that the beach be available for undisturbed breeding, nesting, feeding, preening, and loafing by an assortment of migratory birds. Under the provisions of the National Wildlife Refuge System Improvement Act of 1997, compatible wildlife-dependent recreational use and all other compatible uses are secondary to the "... conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitat..." We do not believe that placing fencing above the mean high tide line will adequately protect these birds, as the adults and young do much of their feeding at the wrack, or daily high tide line. Nor do we believe that closing the beach only if birds actually began to nest at the site is adequate.

Under Alternative B, our Proposed Action in the Revised Draft CCP/EA, we would allow pedestrian access to the beach from about October 1 through March 31 each year. No vehicles would be allowed on the beach at any time. We would also allow pedestrian access to other parts of the Two Mile Beach Unit all year.

Comment: Several commenters expressed a desire to see the existing buildings at the new Two Mile Beach Unit used for a variety of purposes such as housing for researchers or as a fishing clubhouse. Others commented that the we should demolish all the existing buildings and then restore the land to native vegetation.

Response: Under Alternative B, our Proposed Action in the Revised Draft CCP/EA, we would maintain two existing buildings for Refuge office, storage and maintenance purposes, and one for use as a visitor center with displays, exhibits, and regular programs. We would remove all other buildings on the site, all of which are located within the one hundred year floodplain, in compliance with the directives of Executive Order 11988, Floodplain Management. This will allow us to restore the heart of the upland habitat at the Two Mile Beach Unit, in compliance with our mandate under the National Wildlife Refuge System Improvement Act of 1997, which calls for the "... conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitat..."

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Appendix C

Summary of Public Comments Received on the Revised Draft CCP/EA and Their Disposition

Comments received during the public review period for the Revised Draft Comprehensive Conservation Plan and Environmental Assessment (CCP/EA) were considered during preparation of the Decision Document, a Finding of No Significant Impact (FONSI). Comments were received from elected officials, Federal agencies, State and local governments, national conservation and recreation organizations, regional and State organizations, and local residents, as well as out-of-state residents.

The Revised Draft CCP/EA was released for 30 days of public review and comment July 5 through August 4, 2000. A formal public hearing was held July 19, at the Absegami High School in Galloway Township, Atlantic County, New Jersey. Some 80 people were in attendance. The majority of the speakers, including a legislative staff member representing Congressman Jim Saxton, were opposed to the proposed year-round beach closure to motor vehicles at the Holgate Unit of Forsythe National Wildlife Refuge. Most also spoke in opposition to the proposed seasonal beach closure at the Two Mile Beach Unit of Cape May National Wildlife Refuge.

During the comment period we received over 1,700 written comments on the document. Of these, 1,159 opposed and 543 supported the proposed beach closures. Many of the latter comments also urged that we petition the State Tidelands Council to close the State owned intertidal area (i.e., the lands below the mean high tide line) on the Holgate Peninsula to motorized vehicle use.

Those opposed to the proposed beach closures included:

New Jersey Division of Fish and Wildlife;
County of Ocean Board of Chosen Freeholders;
Township of Lower;
Township of Long Beach;
Township of Manchester;
Borough of Beach Haven;
Chamber of Commerce of Southern Ocean County;
Atlantic Surfers;
Eastern Surfing Association/New Jersey District;
Mid-Island Surfcasters;
New Jersey Anglers Association;
Jersey Coast Shark Anglers;
Recreational Fishing Alliance;
New Jersey State Federation of Sportsmen's Clubs;
United Mobile Sportfishermen.

Those supporting the proposed beach closures included:

New Jersey Chapter of the Sierra Club;
Atlantic Audubon Society;
New Jersey Audubon Society;
New Jersey Conservation Foundation;
Wetlands Institute;

Coalition Against Toxics;
Northwest Ecosystem Alliance;
Wilderness Watch;
Lower Township Environmental Commission.

Others commenting on the document included:

New Jersey Trappers Association;
New Jersey Environmental Federation;
Animal Protection Institute;
New Jersey Waterfowlers Association;
Middle Township Beach Association;
Alliance for a Living Ocean.

A summary of the public comments received and the disposition of the concerns expressed in those comments follows.

Comment: The Army Corps of Engineers commented that proposed activities in navigable waters will require a Department of Army permit pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act.

Response: The Service will comply with the Acts, and submit the required permit application(s) and environmental documents prior to any actual construction work.

Comment: The New Jersey Division of Fish and Wildlife (NJDFW), while supportive of our plans to promote piping plover breeding at the Two Mile Beach Unit, does not believe that there is sufficient justification to extend this closure through the shorebird migration season. They believe an April 1-August 15 closure would be sufficient to safeguard piping plover breeding.

Response: The Service funded a research study by the New Jersey Audubon Society's Cape May Bird Observatory in fiscal year 2000 to look at all shorebirds use of the entire beach area. Observations were made twice a week along predetermined transects from mid-August to mid-October on three adjoining beaches, the United States Coast Guard (USCG) LORAN Support Unit, the Service Two Mile Beach Unit, both closed to all public use, and the private property to the north which was open to public use. Our current beach closure through September 31, accommodates late nesting birds, such as, the black skimmer and least tern, as well as migrating shorebirds. Based on the results of the study the Service will make a decision on whether to reduce or maintain our closure period.

Comment: The NJDFW also encouraged us to allow access to the jetty for fishing utilizing the existing parking facilities. This has been permitted in the past by the Coast Guard and will not jeopardize beach nesting birds.

Response: Jetty access is controlled by the Coast Guard and the Service has no authority on Coast Guard land.

Comment: The NJDFW also strongly urged that opportunities to harvest resident Canada and snow goose be expanded to the maximum extent practicable to reduce the negative habitat and societal impacts resulting from the current overabundance of these species. They also proposed an annual review of

waterfowl hunting areas with Division staff and sportsmen representatives to discuss boundary issues, the 40% prohibition on pre-1978 acquisition, addition of new refuge lands and other waterfowl related issues.

Response: Over the past four years we have expanded opportunities to hunt resident Canada and snow geese to the maximum. Opening no more than 40% of a refuge, established as an inviolate sanctuary, to waterfowl hunt is a provision of the Migratory Bird Conservation Act. It applies to all the refuge property within the pre-1978 approved acquisition boundary. We can open more than 40 percent of the refuge property within the pre-1978 approved refuge boundary, only if the Secretary determines that such an action would be beneficial to the species hunted. The 40 percent limitation is intended to ensure that sufficient undisturbed area is available for waterfowl species can carry out their life cycles and sustain their population numbers.

Comment: A number of commenters questioned the availability of scientific data to prove that the seasonal beach closure at the Two Mile Beach Unit of Cape May Refuge would benefit the piping plover.

Response: It is well documented in scientific literature that if human disturbance or presence is eliminated, birds will recolonize/reclaim habitat. There are studies that show that bird respond negatively to human walkers. These studies also note that disturbance by humans and pets often reduces the functional stability of habitat and causes direct and indirect mortality of eggs and chicks. Predation has also been identified as a major factor limiting piping plover reproductive success at many Atlantic Coast sites, and substantial evidence shows that human activities are affecting types, numbers, and activity patterns of predators, thereby exacerbating natural predation. This past summer, after Service closed the Two Mile Beach Unit and the USCG closed the adjoining LORAN Support Unit, plovers nested for the first time since 1994. Least terns nested for the first time since 1988. American oystercatchers also nested. These nests were all located on the Coast Guard LORAN Support Unit beach, where the nesting habitat is better. Our portion of the beach did provide undisturbed critical feeding areas for significant numbers of shorebirds. Piping plover also fed on our beach. There was frequent activity by up to eight adult plovers observed early in the season, but they did not actually nest on the Refuge.

Comment: The Mayor of the Township of Lower stated that the Two Mile Beach Unit of Cape May Refuge did have walking activities, sunbathing activities, fishing activities before becoming a National Wildlife Refuge. Very little concern was given to the piping plover however the plover allegedly nested there.

Response: Lt. Cmdr. Charles Schue III, the Coast Guard base commander, is quoted as stating (Atlantic City Press, July 2, 2000, Richard Degener, Reporter) that "it always has been illegal to walk on the Coast Guard beach or jetty." He said' "We didn't have enough security to enforce it. This is a closed base with no public access." The Two Mile Beach Unit was part of the USCG LORAN Support Unit until October 1999. No piping plover nesting occurred on the Coast Guard property after 1994.

Comment: The Mayor also believed that the coexistence of the piping plover and the needs of recreational users can be met as they are within the Township of Lower at the Cape May Meadows project administered by the Nature Conservancy. Sunbathing, fishing, and walking on the beach area is permitted while the piping plover continues to exist in this area.

Response: Although piping plovers do nest at the Nature Conservancy's Cape May Meadows, the fledging rate per nesting pairs the last three years, 1998, 1999 and 2000, has been 0.43, 0.25, and 0.25, respectively. Population modeling for the piping plovers show that the fledging rate per nesting pair needs to be at least 1.50 for the species to avoid extinction. This indicates that the Cape May Meadows is not providing the habitat the piping plover needs to continue to exist.

Comment: The Mayor also asked if the Fish and Wildlife Service performed a compatibility study in the Cape May Meadows, or on the newly acquired Cape May Refuge.

Response: The Service has no jurisdiction over the Cape May Meadows Preserve. Compatibility determinations are prepared only for lands that are part of the National Wildlife Refuge System. The National Wildlife Refuge Administration Act, as amended by the National Wildlife Refuge System Improvement Act of 1997, states in Section (d)(3)(A)(i) that "On lands added to the System after March 25, 1996, the Secretary shall identify, prior to acquisition, withdrawal, transfer, reclassification, or donation of any such lands, existing compatible wildlife-dependent recreational uses (emphasis added) that the Secretary determines shall be permitted to continue on an interim basis pending completion of the comprehensive conservation plan for the refuge." Section 5(2) of the Act states that "The terms wildlife-dependent recreation and wildlife-dependent recreational use mean a use of a refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation." The Act also states that "The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats (emphasis added) within the United States for the benefit of present and future generations of Americans." This basic "wildlife first" tenant of the Act takes precedence over the six priority wildlife-dependent recreational uses. The formal transfer of the Two Mile Beach Unit from the Coast Guard to the Service occurred during the preparation of our Revised Draft CCP/EA. In the Revised Draft we are in effect determining that fishing, wildlife observation and photography, environmental education and interpretation are indeed compatible uses on the Unit, subject to our proposed seasonal beach closure.

Comment: The Mayor also noted that he was informed when attempting to procure one of the existing buildings at the Two Mile Beach Unit for fire protection that all the buildings would be, with the exception of one or two, demolished. This does not make sense to him.

Response: The maintenance and upkeep of these buildings represent a significant cost and those not required for the management and operation of the Unit would be demolished in our Proposed Action, Alternative B.

Comment: Several commenters, including the Animal Protection Institute, opposed providing trapping opportunities on Forsythe and Cape May Refuges. The Animal Protection Institute believes that trapping is an ineffective "management tool" that does not "control" populations. While they strongly support our efforts to protect threatened and endangered species, they believe we have relied too heavily on lethal predator removal as the primary method of addressing threatened and endangered species recovery efforts on refuges. They argue that protection of these species can, and should be, accomplished using effective, long-term management strategies that are both humane and socially acceptable.

Response: We believe that trapping is an important wildlife management tool. It is used on refuges to control predators and to manage populations of small mammals that impact refuge habitats and facilities such as dikes. Alternative B, the Proposed Action, includes additional opportunities for trapping at Cape May Refuge. Approximately 25% of the Refuge would be opened to trapping of muskrat, raccoon and fox. All trapping is by refuge issued special use permit only. On average, only six trapping permits are issued each year at Forsythe Refuge. We use Department of Agriculture Animal Damage Control trappers at the Two Mile Beach Unit of Cape May Refuge to help control predators in our piping plover recovery efforts. Predation has been identified as a major factor limiting piping plover reproductive success at many Atlantic Coast sites. We also use fencing for exclosures, which has generally proved to be successful. However, on occasion we have documented cases where predators, especially fox, have learned to key in on fenced exclosures, dig under them, and destroy the nests they were intended to protect. Any feral animals that are

caught are turned over to township animal damage control officials. Our trapping program complies with State law and we believe that trapped animals are humanely dealt with. The relocation of any predatory wildlife is illegal in New Jersey.

Comment: Several commenters, including the New Jersey Trappers Association and the New Jersey Federation of Sportsmen's Clubs, asked us to consider providing more trapping opportunities on these public lands.

Response: Alternative B, the Proposed Action, includes additional opportunities for trapping at Cape May Refuge. Approximately 25% of the Refuge would open to trapping of muskrat, raccoon and fox.

Comment: The Wetlands Institute strongly encouraged us to develop collaborative research and management programs on the Jersey Coast Refuges to assist in our conservation efforts. The New Jersey Chapter of the Sierra Club also requested that the final CCP contain a detailed analysis of the best available data regarding the refuge and relevant nearby areas.

Response: The Proposed Action, Alternative B, includes actions involving baseline surveys and monitoring of Refuge resources, expanded use of geographic information systems to document and model species and habitats, increased on-site support for current research efforts and initiating new research on Cape May Refuge.

Comment: A number of commenters, including New Jersey Audubon Society and the New Jersey Environmental Federation, supported our efforts to develop Integrated Pest Management Plans for both Forsythe and Cape May Refuges. They often expressed concern over the possible use of chemicals to control mosquitos and invasive species, such as phragmites.

Response: Through the use of an Integrated Pest Management Plan we hope to significantly reduce our use of pesticides and herbicides.

Comment: The New Jersey Audubon Society recommended that we consider the expansion of the Cape May Refuge by purchasing 100 acres of critical wildlife habitat located immediately south of the former Coast Guard Electronics base and across the Cape May Inlet (known as East Cape May or Sewell Point).

Response: The Service believes it more appropriate for the New Jersey State Department of Environmental Protection to protect this property. They have been actively involved with this property for a number of years.

Comment: A number of commenters, including the Animal Protection Institute, were opposed to providing opportunities for hunting on the Jersey Coast Refuges.

Response: Hunting is one of the six priority public uses of National Wildlife Refuges identified in the National Wildlife Refuge System Administration Act, as amended by the National Wildlife Refuge System Improvement Act of 1997. In the Act Congress clearly instructed us to "ensure that opportunities are provided within the System for compatible wildlife-dependent recreational uses" and "ensure that priority general public uses of the System receive enhanced consideration over other general public uses in planning and management within the System". The Act further states that we are to "provide increased opportunities for families to experience compatible wildlife-dependent recreation, particularly opportunities

for parents and their children to safely engage in traditional outdoor activities, such as fishing and hunting". The State Division of Fish and Wildlife regularly conducts studies of resident game species and establishes bag limits and season lengths that ensure sustainability of the species. We, in cooperation with the States, Canada and Mexico, monitor migratory bird populations in order to make management decisions on seasons and bag limits. In the case of over abundant species such as white-tailed deer, resident Canada and snow geese, the damage these species do to habitat is well documented. The complaints from the public on the impacts of resident geese to private property have been increasing in recent years and involves not only a question of habitat destruction, but public health and safety as well. In these particular cases we believe hunting is an important management tool.

Comment: The New Jersey Waterfowlers Association expressed a hope for expanded opportunities to hunt waterfowl on the Refuges. They also seek increased use, not only for the hunter, but also for birdwatchers, fishermen, boaters and photographers.

Response: The Proposed Action, Alternative B, greatly expands opportunities for hunting, including waterfowl hunting, at Cape May Refuge. It also expands opportunities for fishing, wildlife observation and photography, environmental education and interpretation at the Refuge. These are the six priority public uses of the National Wildlife System identified in the National Wildlife Refuge System Administration Act, as amended by the National Wildlife Refuge System Improvement Act of 1997.

Comment: A number of commenters believed that surfing should be established as a compatible use and permitted to the same extent as the six priority public uses established in the National Wildlife Refuge System Improvement Act.

Response: Surfing was not identified as a wildlife-dependent use in that Act; therefore, it cannot be given the same priority as hunting, fishing, wildlife observation and photography, environmental education and interpretation, the six priority public uses identified in the Act. We believe there are other areas along the Jersey Coast which can accommodate this recreational activity. We do intend to conduct a compatibility review of surfing as soon as our current Draft Policy on Compatibility is finalized.

Comment: Numerous commenters stated that they would like us to pursue acquisition of the remainder of the Two Mile Beach parcel should the U.S. Coast Guard ever decide to pull out.

Response: Under our Proposed Action, Alternative B, we have stated that "Should the Coast Guard's LORAN Support Unit (adjacent to the Two Mile Beach Unit), become excess to its needs, we would work to acquire the site."

Comment: The Surfcasters noted that Alternatives B and C triple the refuge staff, more than triple the budget, propose to acquire all the remainder of land within the legislated boundary of the refuges and more outside the boundary and propose excessive construction of facilities which they deemed boondoggles in order to substantiate the need for bloated staff.

Response: The proposed actions under Alternatives B and C reflect the comments and issues raised during the public scoping meetings which focused on the need for additional public recreational opportunities. In order to provide these opportunities additional facilities, staffing, and related funding is required. Not only has the public requested additional opportunities for hunting, fishing, wildlife observation and photography, environmental education and interpretation, but the National Wildlife Refuge Administration Act, as amended by the National Wildlife Refuge System Improvement Act of 1997 instructs us to provide

additional opportunities as well. Section (a)(4)(H) of the Act tells us to "Provide increased opportunities for families to experience compatible wildlife-dependent recreation, particularly opportunities for parents and their children to safely engage in traditional outdoor activities, such as fishing and hunting."

Comment: A number of commenters felt there was a disparity between the alternatives regarding beach access at the Two Mile Beach Unit. This was especially true regarding Alternative C, which called for a year-round beach closure at the Holgate Unit, while allowing year-round public access at the Two Mile Beach Unit. Alternative A called for continued seasonal access at the Holgate Unit, while keeping the beach at the Two Mile Beach Unit closed year-round. They believed we were unfairly limiting their choices to opening one beach while closing the other beach. Some felt that we were deliberately trying to divide the public in this respect.

Response: This is not true. Alternative A in all National Environmental Policy Act documents is always the "no action alternative, the continuation of existing practices. Furthermore, all possible conditions of beach access are reflected in the range of alternatives we displayed. We are not necessarily limited to these three alternatives in making our final decision. We could take various components of each alternative to structure a new forth alternative. For example, we could take the Forsythe component of Alternative A, the Cape May component of Alternative B, and the Two Mile Beach Unit component of Alternative C, to form a new alternative as our final decision. Some commenters did exactly that when stating that they liked this part of one Alternative and that part of another Alternative.

Comment: Some commenters felt that the plans for both Forsythe and Cape May Refuges fell far short of the provisions set forth in the National Wildlife Refuge System Improvement Act of 1997 relative to providing opportunities for compatible wildlife-dependent recreational activities at both refuges. They believed that bird watching, fishing, waterfowl and upland game hunting, trapping, environmental education, wildlife observation and photography should be permitted wherever possible.

Response: In our professional judgement, the Proposed Action, Alternative B, provides a good range of compatible wildlife-dependent recreational opportunities on both refuges, while allowing us to still meet our conservation mandates under the Act.

Comment: The Jersey Coast Shark Anglers questioned why the planning team for the Jersey Coast Refuges was located in another state. They also questioned how people who don't live in New Jersey or use the Jersey Coast Refuges can possibly make decisions for the local residents.

Response: The Planning Team for the Jersey Coast Refuges project was made up of Refuge staff who are local residents, a representative of the New Jersey Division of Fish and Wildlife, and planning staff from our Regional Office in Hadley, Massachusetts. Our Regional Office planning staff provides support services to all of refuges in our 13 state Northeastern Region as they prepare Comprehensive Conservation Plans. Since the U.S. Fish & Wildlife Service and the National Wildlife Refuge System are national in scope and represents a public trust network of conservation lands, any citizen or resident of the United States has the right to comment on any plan or policy regarding an individual refuge or the system as a whole. These lands, which include the Jersey Coast Refuges, belong to all the American people, not just local residents.

Comment: Several commenters noted that properties acquired for National Wildlife Refuges should remain open to traditional compatible wildlife-related public recreational activities pending completion of refuge management plans, unless demonstrated negative impacts of these uses are present.

Response: Section 668dd(d)(3)(A)(ii) of the National Wildlife refuge Administration Act, as amended by the National Wildlife Refuge System Improvement Act of 1997, states that "On lands added to the System after March 25, 1996, the Secretary shall identify, prior to acquisition, withdrawal, transfer, reclassification, or donation of any such lands, existing compatible wildlife-dependent recreational uses that the Secretary determines shall be permitted to continue on an interim basis pending completion of the comprehensive conservation plan for the refuge." Section 5(2) of the Act states that "The terms wildlife-dependent recreation and wildlife-dependent recreational use mean a use of a refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation." Appendix N of our Revised Draft CCP/EA for the Jersey Coast Refuges contains Interim Compatibility Determinations for both Forsythe and Cape May Refuges. These Interim Determinations indicate that any such uses occurring on lands proposed for acquisition in the document would be considered to be compatible and allowed to continue until plans for those new lands had been completed.

Comment: One commenter felt that the Two-Mile Beach Unit did not benefit from the preliminary planning effort (contacting organizations and individuals to solicit comments and suggestions on natural resources and public uses) that was conducted for Forsythe and Cape May Refuges.

Response: The Two-Mile Beach Unit was addressed as part of a series of public scoping meetings held in November and December 1996. Meetings were held in the Townships of Upper, Dennis, Middle and Lower in Cape May County. We also distributed an Issues Workbook before these meetings were held and distributed a Planning Update following the meetings. In April of 1997 we also held an Alternatives Workshop to help us in the development of our alternatives. During these meetings and through the workbooks we received many public comments on the Two Mile Beach Unit, which was still under the jurisdiction of the Coast Guard at that time.

Comment: A number of commenters, including the Middletown Beach Association, expressed concern over our plans to allow hunting between the Delaware Bay and Route 47.

Response: We acknowledge these concerns and all hunting will be conducted in full compliance with State hunting regulations. We will physically post the 450 foot safety zones in the area involved.

Appendix D

Finding of No Significant Impact
The Jersey Coast Refuges (Edwin B. Forsythe and Cape May National Wildlife Refuges, including the Two Mile Beach Unit) Comprehensive Conservation Plan and Environmental Assessment

Three management alternatives for the Jersey Coast Refuges were presented and evaluated as to their effectiveness in achieving Refuge purposes and their impact on the human environment in the Environmental Assessment. Based on this analysis, I have selected Alternative B (the Service's Proposed Action) to be enacted on the Refuges.

One of the actions the Fish and Wildlife Service (Service) will take under this Alternative is to close all lands above mean high tide in the Holgate Unit of the Brigantine Wilderness Area to motor vehicles year-round in compliance with the Wilderness Act. The year-round closure of the Holgate Unit will be fully implemented October 1, 2002.

The following modifications will be made to Alternative B:

1. Given the fact that the mean high tide line is difficult to identify on the ground, we will use the berm crest and/or wet sand/dry sand lines, which are more readily identifiable, as proxies on the beach at the Holgate Unit for the Wilderness boundary. All motorized vehicles will need to stay below the berm crest and wet sand/dry sand lines while they are on the Holgate Unit to avoid violating the Brigantine Wilderness Area. Educational efforts to familiarize anglers and refuge visitors with this new policy will be implemented beginning October 1, 2002.

2. We will investigate the possibility of establishing an experimental shuttle service which would take anglers and other refuge visitors from a convenient location to the tip of the Holgate Unit from September through mid-November.

3. The land protection efforts for both Refuges will be implemented in accordance with the Forsythe and Cape May Refuge Land Protection Plans (LPPs) which have been reviewed and commented on by the affected land owners, and have been approved in compliance with Service policy and the National Environmental Policy Act (NEPA).

   For Forsythe Refuge, the Revised Draft CCP/EA identified Land Protection Focus Areas encompassing approximately 17,000 acre, of which the Service proposed to acquire 11,500 acres. In preparing the Refuge LPP we removed all lands that were either being developed or had already been developed, reducing our acquisition target to 3,348 acres.

   For Cape May Refuge, the Revised Draft CCP/EA identified Land Protection Focus Areas encompassing approximately 4,900 acre, of which the Service proposed to acquire 3,600 acres. In preparing the Refuge LPP we reevaluated our acquisition target within the Focus Areas and decreased it to 3,591 acres. This was done to insure that we provided long-term protection to the numerous species of shorebirds, neotropical migratory landbirds, waterfowl, long-legged waders, woodcock, raptors, finfish, shellfish, and threatened and endangered species that use Cape May Peninsula.

These new land protection acreage figures are reflected in the Final Comprehensive Conservation Plan for each Refuge. Accordingly, 3,348 acres have been added to the approved boundary of Forsythe Refuge and 3,591 acres have been added to the approved boundary of Cape May Refuge.

Alternative B was selected because it best achieves Refuge purposes, vision and goals; helps fulfill the mission of the National Wildlife Refuge System; maintains and, where appropriate, restores the ecological integrity of both Refuges and the Refuge System; addresses the significant issues and mandates; and is consistent with the principles of sound fish and wildlife management.

I find that the implementation of Alternative B will not have a significant impact on the quality of the human environment in accordance with Section 102 (2) (c) of NEPA and conclude that an environmental impact statement is not required.

_____ _____

Regional Director, Region 5 Date
U.S. Fish and Wildlife Service
Hadley, Massachusetts

Appendix E

Species and communities of special emphasis in the Jersey Coast landscape from *Significant Habitats and Habitat Complexes of the New York Bight Watershed* (USFWS, 1997)

The list is not all-inclusive; it includes species found in the watersheds during part of their life cycle, and selected under the following criteria:

1. Federally listed as threatened or endangered;
2. migratory bird, especially declining species, Neotropical migrants, colonial waterbirds, shorebirds, or waterfowl;
3. marine mammal;
4. Sea turtle;
5. interjurisdictional fish;
6. State-listed as threatened, endangered, or special concern.

Complete species lists are being compiled by staff at the Refuge, and are available for review for vertebrates. They will be published in one or more of the step-down plans.

Codes used in lists of species of special emphasis

Global Element Ranks (from The Nature Conservancy)

G1 Critically imperiled globally because of extreme rarity (typically 5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction.

G2 mperiled globally because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range.

G3 Rare or uncommon but not imperiled. Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g., a single western state, a physiographic region in the East) or because of other factors making it vulnerable to extinction throughout its range; in terms of occurrences, in the range of 21 to 100.

G4 Not rare and apparently secure globally, though it might be quite rare in parts of its range, especially at the periphery; cause for long-term concern. (Usually more than 100 occurrences.)

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

GH Of historical occurrence throughout its range, - possibly extinct i.e., formerly part of the established biota with the expectation that it may be rediscovered (e.g., Bachman's warbler).

GU Possibly in peril range-wide, but status uncertain; need more information.

GX Believed to be extinct throughout its range (e.g., passenger pigeon) with virtually no likelihood that it will be rediscovered.

G#G# Range of ranks; insufficient information to rank more precisely.

G? Not yet ranked.

G#T# For infraspecific taxa; the G rank applies to the full species and the T rank applies to the infraspecific taxon.

G#Q Taxonomic status is questionable.

State Element Ranks (from Nature Conservancy and/or State Heritage Programs)

Numeric Rank: Based primarily on the number of occurrences of the species in the state.

S1 Critically imperiled in state (usually 5 or fewer occurrences); especially vulnerable to extirpation in the state.

S2 Imperiled in state (usually 6 to 20 occurrences).

S3 Rare or uncommon in state (usually 21 to 100 occurrences).

S4 Widespread, abundant, and apparently secure in the state, but with cause for long-term concern (usually more than 100 occurrences).

S5 Widespread, abundant and demonstrably secure in state.

S? Not yet ranked in the state.

SU Unrankable or uncertain status due to lack of information; possibly in peril

SE Exotic: an exotic established in the state.

SA Accidental or casual in state (infrequent and far outside usual range).

SH Historical: species occurred historically in the state (with the expectation that it may be extant and rediscovered), generally not having been verified in the past 20 years.

SX Apparently extirpated from state.

SN or SZN Regularly occurring, usually migratory and typically non-breeding, species for which no significant or effective habitat conservation measures can be taken in the state; no definable occurrences.

For species with distinct breeding (B) and non-breeding (N) populations, a breeding status SRANK can be coupled with its complementary non-breeding SRANK, separated by a comma, e.g., S2B, S3N or S1B, SHN.

SR Reported from state, but without persuasive documentation; species may be misidentified.

SRF Reported falsely; erroneously reported as occurring in the state and error has persisted in the

literature.

SP Potentially occurs in the state, but no occurrences reported.

.1 Species documented from a single location.

Federal Status or Authority

E Formally listed as Endangered under the Endangered Species Act of 1973.

T Formally listed as Threatened under the Endangered Species Act of 1973.

PE Proposed Endangered.

PT Proposed Threatened.

C1 Taxa for which the Service currently has on file substantial information on biological vulnerability and threat(s) to support the appropriateness of proposing to list them as endangered or threatened species.

C1* Taxa which may be possibly extinct (although persuasive documentation of extinction has not been made).

Species of Concern

Federal species of concern includes those species formerly considered C2 candidates as described below. Although these C2 and C3 candidates are no longer officially considered for listing under the Endangered Species Act, the former candidate status is important historical information and is retained for this report.

C2 Taxa for which the information now in the possession of the Service indicates that proposing to list them as endangered or threatened species is possibly appropriate, but for which substantial data on biological vulnerability and threat(s) are not currently known or on file to support the immediate preparation of rules.

C3 Taxa that are no longer being considered for listing as threatened or endangered species. Such taxa are further coded to indicate three subcategories, depending on the reason(s) for removal from consideration.

3A Taxa for which the Service has persuasive evidence of extinction.

3B Names that, on the basis of current taxonomic understanding, do not represent taxa meeting the Act's definition of "species."

3C Taxa that have proven to be more abundant or widespread than was previously believed.

SA Similarity of appearance of species.

Other Federal Authorities

I Interjurisdictional Fish - Move between state and local jurisdictions (e.g., anadromous)

MB Migratory Bird Treaty Act

New Jersey Legal Status

D Declining species: a species that has exhibited a continued decline in population numbers over the years.

E Endangered species: an species whose prospects for survival within the state are in immediate danger due to one or many factors - loss of habitat, over-exploitation, predation, competition, disease. An endangered species requires immediate assistance or extinction will probably follow.

T Threatened species: a species that may become endangered if conditions surrounding the species begin or continue to deteriorate.

EX Extirpated species: a species that formerly occurred in New Jersey, but is not now known to exist within the state.

I Introduced species: a species not native to New Jersey that could not have established itself here without the assistance of man.

INC Increasing species: a species whose population has exhibited a significant increase, beyond the normal range of its life cycle, over a long time period.

P Peripheral: a species whose occurrence in New Jersey is at the extreme edge of its present natural range.

S Stable species: a species whose population is not undergoing any long-term increase or decrease within its natural cycle.

U Undetermined species: a species about which there is not enough information available to determine the status.

LP Pinelands: a species listed by the Pinelands Commission as endangered or threatened within their legal jurisdiction.

Species and Community Presence in geographic macrosites that comprise Cape May National Wildlife Refuge. The Refuge lands are found under the Cape May Peninsula. A detailed description of this habitat macrosite can be found in *Significant Habitats and Habitat Complexes of the New York Bight Watershed* (USFWS Coastal Ecosystem Program, 1997). Presence is marked with the following codes:

+ Known to be present
H Occurred prior to 1970, not known to be present now
? Status unsure

Scientific Name	Common Name(s)	Global	Federal	NJ Rank	NJ Status	Cape May
ANIMALS						
INVERTEBRATES						
MOLLUSCA						
Argopecten irradians	bay scallop					+
Crassostrea virginica	eastern oyster					
Mercenaria mercenaria	northern quahog					+
Mulinia lateralis	dwarf surfclam					
Mya arenaria	softshell clam					+
Mytilus edulis	blue mussel					+
Spisula solidissima	Atlantic surfclam					+
Illex illecebrosus	northern shortfin squid					+
Loligo pealei	longfin squid					+
ARTHROPODA						
INSECTA						
ODONATA (Dragonflies and Damselflies):						
Aeshna clepsydra	mottled darner	G4		S?		
Anax longipes	comet darner	G5		S2?		+
Celithemis martha	Martha spotted skimmer	G4		S3S4		+
Celithemis verna	double-ringed pennant	G5		S1?		+
Enallagma pictum	painted bluet	G4		S3?		+
Enallagma recurvatum	barrens bluet damselfly	G3	3C	S3		+
Libellula axilena	dark-bordered skimmer	G5		S1?		+
Nehalennia intergricollis	round-necked damselfly	G5				+
Somatochlora provocans	treetop emerald skimmer	G3G4		S2S4		+

Scientific Name	Common Name(s)	Global	Federal	NJ Rank	NJ Status	Cape May
Sympetrum ambiguum	blue-faced meadowfly	G5		S1?		+
COLEOPTERA (Beetles):						
Cicindela d. dorsalis	northeastern beach tiger beetle	G4T1T2	T	SH	E	
Cicindela dorsalis media	white tiger beetle	G4T4		S1S2		
LEPIDOPTERA (Butterflies and Moths):						
Asterocampa clyton	tawny emperor	G5		S4		+
Atrytonopsis hianna	dusted skipper	G4		S4		+
Boloria selene myrina	silver-bordered fritillary	G5T5		S2S3		+
Euphyes conspicua	black dash	G4		C?		+
Fixsenia favonius ontario	northern hairstreak	G4T4		NA?		?
Hesperia attalus slossonae	seminole skipper	G4T3		S2S3		
Incisalia henrici	Henry's elfin	G5		S3S4		+
Incisalia irus	frosted elfin	G4		SU		+
Mitoura hesseli	Hessel's hairstreak	G3G4	3C	S3S4		+
Neonympha areolata septentrionalis	Lakehurst satyr	G5T3T4Q		S3		
Panoquina panoquin	salt marsh skipper	G5		S5		+
Parrhasius m-album	white m hairstreak	G5		C?		+
Pieris protodice	checkered white	G5		SH		+
Problema bulenta	rare skipper	G2G3	C2	S2		+
Agrotis buchholzi	Buchholz's dart	G2G3	C2	S2		
Apharetra purpurea	a noctuid moth	G4Q		S?		
Callopistria granitosa	granitosa fern moth	G4G5		S2S3		
Catocala herodias gerhardi	pine barrens underwing	G3T3		S3		
Catocala jair ssp. 2	jair underwing	G4T4		S3	U	
Catocala p. pretiosa	precious underwing	G4T2T3	C2	S2S3		+
Chytonix sensilis	a noctuid moth	G4		S1S3		
Crambus daeckellus	Daecke's pyralid moth	G1G3	C2	S1S3		
Datana ranaeceps	a hand-maid moth	G4		S3S4		
Faronta rubripennis	pink streak	G3G4		SU		
Heterocampa varia	a notodontid moth	G3G4		S3		
Hypomecis buchholzaria	Buchholz's gray	G3G4		S3		
Idaea violacearia	a geometrid moth	G4		S1S3		

Scientific Name	Common Name(s)	Global	Federal	NJ Rank	NJ Status	Cape May
Itame sp. 1	spanworm (geometrid moth)	G3Q		S3		
Lithophane lemmeri	Lemmer's pinion moth	G3G4	C2	S2		
Merolonche dolli	Doll's merolonche	G3	C2	S1S3		
Meropleon cosmion	a noctuid moth	G4		S1S2		
Metarranthis pilosaria	coastal swamp metarranthis	G3G4		S3S4		
Papaipema appassionata	pitcher plant borer moth	G4		S2S3		
Papaipema stenocelis	chain fern borer moth	G4		S3		
Ptichodis bistrigata	southern ptichodis	GU		S1S3		
Spartiniphaga carterae	Carter's noctuid moth	G2G3	C2	S2		
Zale sp. 1	pine barrens zale	G3Q		S3		
Zanclognatha sp.1	a noctuid moth	GUQ		S3		
CRUSTACEA						
Callinectes sapidus	blue crab					+
MEROSTOMATA						
Limulus polyphemus	horseshoe crab					+
VERTEBRATES						
FISH						
ELASMOBRANCHIOMORPHI (Cartilaginous Fishes):						
Mustelus canis	smooth dogfish	G?				
Raja eglanteria	clearnose skate					
Raja erinacea	little skate					
Raja ocellata	winter skate					
OSTEICHTHYES (Bony Fishes):						
Ammodytes americanus	American sandlance	G?				+
Anguilla rostrata	American eel	G5	I	S5		+
Aphredoderus sayanus	pirate perch	G5		S4		
Menidia beryllina	inland silverside	G5		S4S5		+
Menidia menidia	Atlantic silverside	G5				+
Opsanus tau	oyster toadfish					+
Strongylura marina	Atlantic needlefish	G5	I			
Paralichthys dentatus	summer flounder	G?				+

Scientific Name	Common Name(s)	Global	Federal	NJ Rank	NJ Status	Cape May
Scophthalmus aquosus	windowpane	G?				+
Acantharchus pomotis	mud sunfish	G5		S4		
Enneacanthus obesus	banded sunfish	G5		S4		
Alosa aestivalis	blueback herring	G5	I	S5		+
Alosa mediocris	hickory shad	G5	I	S3	W	
Alosa pseudoharengus	alewife	G5	I	S5		+
Alosa sapidissima	American shad	G5	I	S3S4	W	?
Brevoortia tyrannus	Atlantic menhaden	G?	I			+
Clupea harengus	Atlantic herring	G?	I			+
Myoxcephalus aenaeus	grubby sculpin	G?				
Notemigonus crysoleucas	golden shiner	G5		S5		
Notropis hudsonius	spottail shiner	G5		S5		
Fundulus diaphanus	banded killifish	G5		S5		+
Fundulus heteroclitus	mummichog	G5		S5		+
Fundulus luciae	spotfin killifish	G3G4		S3		+
Anchoa hepsetus	striped anchovy					
Anchoa mitchilli	bay anchovy	G5	I			+
Esox americanus americanus	redfin pickerel	G5		S5		
Merluccius bilinearis	silver hake	G?	I			
Pollachius virens	pollack	G?				+
Urophycis chuss	red hake	G?	I			+
Apeltes quadracus	fourspine stickleback	G5		S4		+
Gobiosoma bosci	naked goby	G5				+
Gobiosoma ginsburgi	seaboard goby	G?				+
Ameiurus catus	white catfish	G5		S5		
Ameiurus natalis	yellow bullhead	G5		S5		
Ameriurus nebulosus	brown bullhead	G5		S5		
Tautoga onitis	tautog	G?				+
Tautogolabrus adspersus	cunner	G?				+
Mugil cephalus	striped mullet	G5	I			+
Morone americana	white perch	G5		S5		+
Morone saxatilis	striped bass	G5	I	S4	W	+
Perca flavescens	yellow perch	G5		S5		+
Pleuronectes americanus	winter flounder	G5?	I			+
Pomatomus saltatrix	bluefish	G?	I			+

Scientific Name	Common Name(s)	Global	Federal	NJ Rank	NJ Status	Cape May
Salvelinus fontinalis	brook trout	G5		S3		
Cynoscion regalis	weakfish	G?	I			+
Leiostomas xanthurus	spot	G5	I			+
Menticirrhus saxatilis	northern kingfish	G?	I			+
Micropogonias undulatus	Atlantic croaker	G5				+
Scomber scombrus	Atlantic mackerel	G?				+
Centropristis striata	black sea bass	G?	I			+
Trinectes maculatus	hogchoker	G5				+
Stenotomus chrysops	scup	G?				+
Peprilus triacanthus	butterfish	G?				+
Syngnathus fuscus	northern pipefish	G?				+
Prionotus carolinus	northern searobin	G?	I			+
Prionotus evolans	striped searobin	G?	I			
Umbra pygmaea	eastern mudminnow	G5		S5		
AMPHIBIANS						
Acris c. crepitans	northern cricket frog	G5		S3	U	
Hyla andersonii	pine barrens treefrog	G4	3C	S3	E	+
Hyla chrysoscelis	Cope's gray treefrog	G5		S2	E	
Rana sphenocephala	southern leopard frog	G5		S5	S	
Scaphiopus h. holbrookii	eastern spadefoot	G5		S4	D	
Ambystoma maculatum	spotted salamander	G5		S3	D	
Ambystoma t. tigrinum	eastern tiger salamander	G5		S2	E	+
Hemidactylium scutatum	four-toed salamander	G5		S3	D	
Pseudotriton m. montanus	eastern mud salamander	G5		S1	T	
REPTILES						
Eumeces fasciatus	five-lined skink	G5		S3	U	
Crotalus horridus	timber rattlesnake	G5		S2	E	
Elaphe guttata	corn snake	G5		S1	E	
Heterodon platirhinos	eastern hognose snake	G5		S5	D	
Pituophis m. melanoleucus	northern pine snake	G5T4	C2	S3	T	+
Caretta caretta	loggerhead sea turtle	G3	T	SN	E	+
Clemmys guttata	spotted turtle	G5		S5		
Clemmys insculpta	wood turtle	G4		S3	T	
Clemmys muhlenbergii	bog turtle	G3	C1	S2	E	

Scientific Name	Common Name(s)	Global	Federal	NJ Rank	NJ Status	Cape May
Malaclemys t. terrapin	northern diamondback terrapin	G5T5	C2	SU		+
Terrapene c. carolina	eastern box turtle	G5		S5	S	
BIRDS						
Gavia immer	common loon	G5	MB	SN	S	M
Gavia stellata	red-throated loon	G5	MB	SN	S	M/W
Podiceps auritus	horned grebe	G5	MB	SN	S	M/W
Podilymbus podiceps	pied-billed grebe	G5	MB	S1	E/S	B/W
Pelicanus occidentalis	brown pelican	G4	MB	S1	INC	S
Phalacrocorax auritus	double-crested cormorant	G5	MB	SN	INC	S/M
Ardea herodias	great blue heron	G5	MB	S2	T/S	B?/M/W
Botaurus lentiginosus	American bittern	G4	MB	S3	T/S	
Bubulcus ibis	cattle egret	G5	MB	S3	INC/INC	B/M
Casmerodius albus	great egret	G5	MB	S3	S/S	B/M
Egretta caerulea	little blue heron	G5	MB	S3	T/S	B/M
Egretta thula	snowy egret	G5	MB	S3	S/S	B/M
Egretta tricolor	tricolored heron	G5	MB	S3	INC/S	B/M
Ixobrychus exilis	least bittern	G5	MB	S3	D/S	B/M
Nycticorax violaceus	yellow-crowned night-heron	G5	MB	S2	T/T	B/M
Nycticorax nycticorax	black-crowned night-heron	G5	MB	S3	D/S	B/M
Plegadis falcinellus	glossy ibis	G5	MB	S3	D/S	B/M
Cygnus columbianus	tundra swan	G5	MB	SN	S	M
Branta canadensis	Canada goose	G5	MB	S5		B/M/W
Branta bernicla	brant	G5	MB	SN		M/W
Chen caerulescens	snow goose	G5	MB	SN		M/W
Aix sponsa	wood duck	G5	MB	S5		B/M
Anas acuta	northern pintail	G5	MB	SN		M/W
Anas americana	American wigeon	G5	MB	SN		M/W
Anas clypeata	northern shoveler	G5	MB	SN		M/W
Anas crecca	green-winged teal	G5	MB	SN		M/W
Anas discors	blue-winged teal	G5	MB	S5		M
Anas platyrhynchos	mallard	G5	MB	S5		B/M/W

Scientific Name	Common Name(s)	Global	Federal	NJ Rank	NJ Status	Cape May
Anas rubripes	American black duck	G4	MB	S4		B/M/W
Anas strepera	gadwall	G5	MB	S5		B/M/W
Aythya valisineria	canvasback	G5	MB	SN		M/W
Aythya americana	redhead	G5	MB	SN		
Aythya collaris	ring-necked duck	G5	MB	SN		
Aythya marila	greater scaup	G5	MB	SN		M/W
Aythya affinis	lesser scaup	G5	MB	SN		M/W
Bucephala clangula	common goldeneye	G5	MB	SN		
Bucephala albeola	bufflehead	G5	MB	SN		
Clangula hyemalis	oldsquaw	G5	MB	SN		M/W
Lophodytes cucullatus	hooded merganser	G5	MB	SN		M/W
Melanitta nigra	black scoter	G5	MB	SN		M/W
Melanitta fusca	white-winged scoter	G5	MB	SN		M/W
Melanitta perspicillata	surf scoter	G5	MB	SN		M/W
Mergus merganser	common merganser	G5	MB	S4		
Mergus serrator	red-breasted merganser	G5	MB	SN		M/W
Oxyura jamaicensis	ruddy duck	G5	MB	SN		
Accipiter cooperii	Cooper's hawk	G4	MB	S2	E	M
Accipter striatus	sharp-shinned hawk	G5	MB	S1	U/U	M
Buteo lineatus	red-shouldered hawk	G5	MB	S2	E/T	B/M
Buteo platypterus	broad-winged hawk	G5	MB	S4	S/S	B/M
Circus cyaneus	northern harrier	G5	MB	S2	E/U	B/M/W
Falco columbarius	merlin	G4	MB	SN	S	M
Falco peregrinus	peregrine falcon	G3	MB	S1	E	B/M
Haliaeetus leucocephalus	bald eagle	G3G4	MB	S1	E	B?/M/W
Pandion haliaetus	osprey	G5	MB	S3	T/T	B/W
Fulica americana	American coot	G5	MB	S1	D	W
Gallinula chloropus	common moorhen	G5	MB	S4		B
Laterallus jamaicensis	black rail	G4?	MB	S3	T	B
Porzana carolina	sora	G5	MB	S4		M
Rallus elegans	king rail	G4G5	MB	S3	U/U	
Rallus limicola	Virginia rail	G5	MB	S4		B
Rallus longirostris	clapper rail	G5	MB	S5		B/M
Charadrius melodus	piping plover	G3	MB	S1	E	B/M
Charadrius semipalmatus	semipalmated plover	G5	MB	S?	S	M
Pluvialis dominica	lesser golden-plover	G5	MB	SN	S/S	

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Pluvialis squatarola	black-bellied plover	G5	MB	SN	S/S	M
Haematopus palliatus	American oystercatcher	G5	MB	S4	INC/S	M
Arenaria interpres	ruddy turnstone	G5	MB	SN	S	M
Bartramia longicauda	upland sandpiper	G5	MB	S1	E	
Calidris alba	sanderling	G5	MB	SN	D	M/W
Calidris alpina	dunlin	G5	MB	SN	INC	M/W
Calidris canutus	red knot	G5	MB	SN	D	M
Calidris fuscicollis	white-rumped sandpiper	G5	MB	SN	S	M
Calidris himantopus	stilt sandpiper	G5	MB	SN	INC	
Calidris maritima	purple sandpiper	G5	MB	SN	INC	W
Calidris maura	western sandpiper	G5	MB	SN	S	
Calidris minutilla	least sandpiper	G5	MB	SN	S	
Calidris pusilla	semipalmated sandpiper	G5	MB	SN	S	M
Catoptrophorus semipalmatus	willet	G5	MB	S4	INC/S	B/M
Limnodromus griseus	short-billed dowitcher	G5	MB	SN	S	
Limosa fedoa	marbled godwit	G5	MB	SN	D	
Limosa haemastica	Hudsonian godwit	G5	MB	SN	D	
Numenius phaeopus	whimbrel	G5	MB	SN	S	M
Scolopax minor	American woodcock	G5	MB	S5		B/W
Tringa flavipes	lesser yellowlegs	G5	MB	SN	S	B/M
Tringa melanoleuca	greater yellowlegs	G5	MB	SN	S	M
Larus philadelphia	Bonaparte's gull	G5	MB	SN	S	M
Rynchops niger	black skimmer	G5	MB	S2	E	B/M
Sterna antillarum	least tern	G4	MB	S2	E	B/M
Sterna dougallii	roseate tern	G5	MB	S1	E	
Sterna forsteri	Forster's tern	G5	MB	S3	INC/S	B/M
Sterna hirundo	common tern	G5	MB	S3	D/S	B/M
Sterna nilotica	gull-billed tern	G5	MB	S3	S	B/M
Coccyzus americanus	yellow-billed cuckoo	G5	MB	S4	S/S	B
Coccyzus erthropthalmus	black-billed cuckoo	G5	MB	S4	S/S	B
Asio flammeus	short-eared owl	G5	MB	S1	E/U	W
Strix varia	barred owl	G5	MB	S3	T/T	B/W
Tyto alba	common barn-owl	G5	MB	S4	S/S	B/M/W
Caprimulgus carolinensis	chuck-will's-widow	G5	MB	S4	INC/S	B
Caprimulgus vociferus	whip-poor-will	G5	MB	S4	D/S	B/M

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Chordeiles minor	common nighthawk	G5	MB	S4	S/S	M
Archilochus colubris	ruby-throated hummingbird	G5	MB	S4	D/S	B/M
Chaetura pelagica	chimney swift	G5	MB	S5	S/S	B
Dryocopus pileatus	pileated woodpecker	G5	MB	S4	S/S	
Melanerpes erythrocephalus	red-headed woodpecker	G5	MB	S3	T/T	B
Sphyrapicus varius	yellow-bellied sapsucker	G5	MB	SN	S	M
Contopus virens	eastern wood-pewee	G5	MB	S4	S/S	B/M
Empidonax minimus	least flycatcher	G5	MB	S4	S/S	M
Empidonax traillii	willow flycatcher	G5	MB	S4	INC/S	B
Empidonax virescens	acadian flycatcher	G5	MB	S4	INC/S	B
Myiarchus crinitus	great crested flycatcher	G5	MB	S4	S/S	B/M
Tyrannus tyrannus	eastern kingbird	G5	MB	S5	D/D	B/M
Eremophila alpestris	horned lark	G5	MB	S3	D/S	B
Hirundo pyrrhonota	cliff swallow	G5	MB	S2	T/S	M
Progne subis	purple martin	G5	MB	S4	D/S	B/M
Riparia riparia	bank swallow	G5	MB	S4	S/S	M
Steldidopteryx serripennis	northern rough-winged swallow	G5	MB	S4	S/S	B
Certhia americana	brown creeper	G5	MB	S4	S/S	M/W
Cistothorus platensis	sedge wren	G5	MB	S1	E	B?
Cistothorus palustris	marsh wren	G5	MB	S4	D/S	B/W
Catharus fuscescens	veery	G5	MB	S4	S/S	M
Catharus guttatus	hermit thrush	G5	MB	S4	S/S	M/W
Catharus ustulatus	Swainson's thrush	G5	MB	SN	S	M
Hylocichla mustelina	wood thrush	G5	MB	S5	S/S	B
Polioptila caerulea	blue-gray gnatcatcher	G5	MB	S4	INC/S	B/M
Sialia sialis	eastern bluebird	G5	MB	S4	S	B/M
Dumetella carolinensis	gray catbird	G5	MB	S5	S/S	B/M
Vireo flavifrons	yellow-throated vireo	G5	MB	S4	S/S	M
Vireo griseus	white-eyed vireo	G5	MB	S4	D/S	B
Vireo solitarius	solitary vireo	G5	MB	S3	S/S	
Dendroica caerulescens	black-throated blue warbler	G5	MB	S4	S/S	
Dendroica cerulea	cerulean warbler	G4	MB	S3	S/S	
Dendroica coronata	yellow-rumped warbler	G5	MB	S4	S/S	M

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Dendroica discolor	prairie warbler	G5	MB	S5	S/S	B/M
Dendroica dominica	yellow-throated warbler	G5	MB	S4	S/S	B/M
Dendroica fusca	blackburnian warbler	G5	MB	S4	S/S	M
Dendroica magnolia	magnolia warbler	G5	MB	S4	S/S	M
Dendroica palmarum	palm warbler	G5	MB	SN	S	M
Dendroica pensylvanica	chestnut-sided warbler	G5	MB	S4	S/S	M
Dendroica pinus	pine warbler	G5	MB	S4	S/S	
Dendroica striata	blackpoll warbler	G5	MB	SN	S	M
Dendroica virens	black-throated green warbler	G5	MB	SN	S	M
Helmitheros vermivorus	worm-eating warbler	G5	MB	S4	S/S	B
Icteria virens	yellow-breasted chat	G5	MB	S4	D/S	B
Mniotilta varia	black-and-white warbler	G5	MB	S4	S/S	B/M
Oporornis formosus	Kentucky warbler	G5	MB	S4	S/S	B
Parula americana	northern parula	G5	MB	S3	P/S	B/M
Protonotaria citrea	prothonotary warbler	G5	MB	S3	INC/S	B
Seiurus aurocapillus	ovenbird	G5	MB	S5	S/S	B/M
Seiurus motacilla	Louisiana waterthrush	G5	MB	S4	S/S	B/M
Seiurus noveboracensis	northern waterthrush	G5	MB	S4	S/S	M
Setophaga ruticilla	American redstart	G5	MB	S5	S/S	B/M
Vermivora pinus	blue-winged warbler	G5	MB	S4	INC/S	B/M
Vermivora ruficapilla	Nashville warbler	G5	MB	S3	S/S	M
Wilsonia canadensis	Canada warbler	G5	MB	S4	S/S	M
Wilsonia citrina	hooded warbler	G5	MB	S4	D/S	B
Piranga olivacea	scarlet tanager	G5	MB	S4	S	B/M
Piranga rubra	summer tanager	G5	MB	S4	S	B
Pheucticus ludovicianus	rose-breasted grosbeak	G5	MB	S4	S/S	M
Ammodramus caudacutus	sharp-tailed sparrow	G5	MB	S4	S/S	B/M
Ammodramus maritimus	seaside sparrow	G4	MB	S4	S/S	B/M
Ammodramus savannarum	grasshopper sparrow	G4	MB	S2	T/T	B?/M
Junco hyemalis	dark-eyed junco	G5	MB	S4	S/S	M/W
Melospiza georgiana	swamp sparrow	G5	MB	S4	S/S	M/W
Passerculus sandwichensis	savannah sparrow	G5	MB	S2	T/T	B/M/W
Pipilo erythrophthalmus	rufous-sided towhee	G5	MB	S5	S/S	M/W
Pooecetes gramineus	vesper sparrow	G5	MB	S2	E	M/W
Zonotrichia albicollis	white-throated sparrow	G5	MB	SN	S/S	M/W

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Dolichonyx oryzivorus	bobolink	G5	MB	S2	T/T	M
Icterus spurius	northern oriole	G5	MB	S5	S/S	B/M
Sturnella magna	eastern meadowlark	G5	MB	S4	D/S	B/M/W
Carduelis pinus	pine siskin	G5	MB	SN	S	M/W
Carpodacus purpureus	purple finch	G5	MB	S4	S/S	M
MAMMALS						
Synaptomys cooperi	southern bog lemming	G5		S2	U	
Balaenoptera physalus	finback whale	G2	E	SN	E	+
Delphinus delphis	common dolphin	G5		SN	U	+
Lagenorhynchus acutus	Atlantic white-sided dolphin	G4				+
Megaptera novaeangliae	humpback whale	G3	E	SA	E	+
Stenella coeruleoalba	striped dolphin	G5		SN	U	+
Tursiops truncatus	bottle-nosed dolphin	G5		SN	S	+
Lutra canadensis	river otter	G5		S4		
VASCULAR PLANTS						
PTERIDOPHYTES (Ferns and Fern Allies)						
Lygodium palmatum	climbing fern	G4		S2	LP	
Schizaea pusilla	curly-grass fern	G3	3C	S3	LP	
GYMNOSPERMS (Cone-bearing Plants)						
Chamaecyparis thyoides	Atlantic white cedar	G4		S5		+
ANGIOSPERMS (Flowering Plants):						
MONOCOTYLEDONEAE (Monocots):						
Sagittaria australis	southern arrowhead	G5		S1	E	
Sagittaria subulata	strap-leaf arrowhead	G4		S2		
Sagittaria teres	quill-leaf arrowhead	G3		S1	E	
Orontium aquaticum	golden club	G5		S4		
Carex barrattii	Barratt's sedge	G4	3C	S4	LP	
Carex mitchelliana	Mitchell's sedge	G3G4		S2		+
Carex polymorpha	variable sedge	G2G3	C2	S1	E	
Carex rostrata	beaked-sedge	G5		S2		
Cyperus lancastriensis	Lancaster flatsedge	G5		S2	E	

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Cyperus polystachyos var. texensis	coast flatsedge	G5T5		S1	E	+
Cyperus schweinitzii	Schweinitz's flatsedge	G5		SE		
Eleocharis brittonii	Britton's spikerush	G4G5		S1.1	E	+
Eleocharis equisetoides	knotted spikerush	G4		SH	E(LP)	
Eleocharis melanocarpa	black-fruited spikerush	G4		S1	E	+
Eleocharis quadrangulata	angled spikerush	G4		S2		+
Eleocharis tortilis	twisted spikerush	G5		S1	E	+
Eriophorum tenellum	rough cottongrass	G5		S1	E	
Fuirena squarrosa	hairy umbrella-sedge	G4G5		S3		
Rhynchospora filifolia	thread-leaved beaked rush	G5		S1	E	+
Rhynchospora globularis	grass-like beaked rush	G5		S1	E	+
Rhynchospora inundata	horned beaked rush	G4		S2	LP	+
Rhynchospora knieskernii	Knieskern's beaked rush	G1	T	S1	E(LP)	
Rhynchospora microcephala	small-headed beaked rush	G?		S1	E	
Rhynchospora pallida	pale beaked rush	G3		S3		
Rhynchospora rariflora	rare-flowering beaked rush	G5		S1	E	+
Rhynchospora scirpoides (=Psilocarya scirpoides)	long-beaked bald-rush	G4		S2		
Scirpus longii	Long's bulrush	G2	C2	S2	E(LP)	
Scleria minor	slender nutrush	G4		S4	LP	
Scleria pauciflora var. caroliniana	few-flowered nutrush	G5T4T5		S2		
Scleria reticularis var. pubescens	nutrush	G5TU		S4		
Eriocaulon parkeri	Parker's pipewort	G3	3C	S2		
Juncus caesariensis	New Jersey rush	G2	C2	S2	E (LP)	
Juncus coriaceus	leathery rush	G5		S1	E	+
Juncus torreyi	Torrey's rush	G5		SU		+
Helonias bullata	swamp pink	G3	T	S3	E(LP)	
Melanthium virginicum	Virginia bunchflower	G5		S1	E	
Narthecium americanum	bog asphodel	G2	C1	S2	E(LP)	
Tofieldia racemosa	false asphodel	G5		S1	E(LP)	
Uvularia puberula var.	pine barren bellwort	G5T3		S2	E	

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nitida						
Zigadenus leimanthoides	death-camus	G4Q		S1	E	
Arethusa bulbosa	swamp pink	G4		S2		+
Listera australis	southern twayblade	G4		S2	LP	+
Platanthera cristata	crested yellow orchid	G5		S3	LP	
Platanthera flava var. herbiola	tubercled rein orchid	G4T4Q	3C	S2		+
Platanthera integra	yellow fringeless orchid	G4	3C	S1	E(LP)	
Platanthera nivea	snowy orchid	G5		SH	E	+
Spiranthes laciniata	lace-lip ladies'-tresses	G4G5		S1	E	+
Spiranthes odorata	fragrant ladies'-tresses	G5		S2		+
Tipularia discolor	cranefly orchid	G4G5		S3		+
Aristida basiramea var. curtissii	Curtis' three-awned grass	G5T4T5		S2		
Calamagrostis pickeringii	Pickering's reedgrass	G4		S1	E	
Calamovilfa brevipilis	pine barren reedgrass	G4	3C	S4	LP	
Coelorachis rugosa	wrinkled jointgrass	G5		S1	E	+
Dichanthelium aciculare	bristling witchgrass	G4G5		S1	E	+
Dichanthelium scabriusculum	sheathed witchgrass	G4		S2		
Dichanthelium wrightianum	Wright's witchgrass	G4		S2		
Gymnopogon brevifolius	short-leaved skeleton grass	G5		S1	E	+
Muhlenbergia capillaris	long-awned smoke grass	G5		S1	E	
Muhlenbergia torreyana	pine barren smoke grass	G3	3C	S3	LP	+
Panicum hirstii	Hirst's panic grass	G1	C2	S1	E(LP)	
Sacciolepis striata	American cupscale	G5		S1	E	+
Sphenopholis pensylvanica	swamp oats	G4		S3		+
Xyris caroliniana	sand yellow-eyed grass	G4G5		S1	E(LP)	
Xyris fimbriata	fringed yellow-eyed grass	G5		S1	E	
Xyris jupicai	Richard's yellow-eyed grass	G5		SH		+
Xyris montana	northern yellow-eyed grass	G4		S1	E	
DICOTYLEDONEAE (Dicots):						

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Sesuvium maritimum	seabeach purslane	G5		S2		
Amaranthus pumilus	seabeach amaranth	G2	T	SH	E	
Eryngium aquaticum	marsh rattlesnake master	G4		S3		
Hydrocotyle verticillata	water-pennywort	G5		S2		+
Asclepias lanceolata	smooth orange milkweed	G5		S2		
Aster radula	swamp or low rough aster	G5		S1	E	
Boltonia asteroides var. glastifolia	boltonia	G5T?		S1	E	+
Cacalia atriplicifolia	pale indian plantain	G4G5		S1	E	
Chrysopsis (=Pityopsis) falcata	sickle-leaved golden aster	G3G4		S3	LP	
Cirsium virginianum	Virginia thistle	G3G4		S1	E	
Coreopsis rosea	pink or rose tickseed	G3		S2	LP	
Eupatorium resinosum	pine barren boneset	G3	C2	S2	E(LP)	
Gnaphalium helleri	Heller's everlasting	G4G5		SH	E	
Kuhnia eupatorioides	false boneset	G5		S1	E	
Pluchea foetida	stinking fleabane	G5		S1	E	+
Solidago elliottii	coastal goldenrod	G5		S3		
Solidago tarda	late goldenrod	G?		S3		
Onosmodium virginianum	Virginia false-gromwell	G4		S1	E	
Lobelia boykinii	Boykin's lobelia	G2	C2	S1	E(LP)	
Lobelia canbyi	Canby's lobelia	G4		S3	LP	
Honckenya peploides	seabeach sandwort	G5		S2		
Chenopodium rubrum	red goosefoot	G5		S1	E	
Hypericum adpressum	creeping St. John's-wort	G2G3	C2	S2	E	+
Cuscuta cephalanthi	button-bush dodder	G5		S1	E	
Cuscuta polygonorum	smartweed dodder	G5		S2		+
Stylisma pickeringii var. pickeringii	Pickering's morning-glory	G4T2T3	C2	S1	E(LP)	
Diospyros virginiana	persimmon	G5		S5		
Corema conradii	broom crowberry	G4		S1	E(LP)	
Crotonopsis elliptica	elliptical rushfoil	G5		S2	LP	
Euphorbia purpurea	glade spurge	G3	C2	S1	E	+
Aeschynomene virginica	sensitive joint-vetch	G2	T	S1	E(LP)	
Clitoria mariana	butterfly pea	G5		S1	E	+

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Desmodium sessilifolium	sessile-leaved tick-trefoil	G5		S1	E	
Desmodium strictum	pineland tick-trefoil	G4		S2	LP	+
Galactia volubilis	downey milk-pea	G5		SH	E	+
Stylosanthes biflora	pencil flower	G5		S3		
Quercus nigra	water oak	G5		S1	E	+
Gentiana autumnalis	pine barren gentian	G3	3C	S3	LP	+
Myriophyllum tenellum	slender water-milfoil	G5		S1	E	
Utricularia biflora	two-flowered bladderwort	G5		S1	E	
Utricularia olivacea	dwarf white bladderwort	G4		S1	E(LP)	
Utricularia purpurea	purple bladderwort	G5		S3	LP	
Utricularia resupinata	reversed bladderwort	G4		S1	E(LP)	+
Linum intercursum	sandplain flax	G4G5		S1	E	+
Ammannia latifolia	Koehn's tooth-cup	G5		S1	E	
Rotala ramosior	tooth-cup	G5		S3		+
Rhexia aristosa	awned meadowbeauty	G3	C2	S1	E(LP)	+
Nymphoides cordata	floating heart	G5		S3	LP	
Ludwigia hirtella	hairy ludwigia	G5		S2	LP	+
Oenothera humifusa	sea-side evening-primrose	G5		S1	E	+
Oenothera oakesiana	Oakes' evening-primrose	G4?Q		S2		+
Plantago maritima ssp. juncoides	seaside plantain	G5T5		S2		
Polygonum densiflorum	stout smartweed	G5		S1	E	+
Polygonum glaucum	seabeach knotweed	G3		S1	E	
Polygonum setaceum var. injectum	swamp smartweed	G5T4		S2?		?
Glaux maritima	seabeach milkwort	G5		SH	E	
Hottonia inflata	featherfoil	G4		S1	E	+
Prunus angustifolia	chickasaw plum	G5		S2	E	
Diodia virginiana	larger buttonweed	G5		S1	E	+
Galium hispidulum	coast bedstraw	G5		S1	E	+
Oldenlandia uniflora (=Hedyotis uniflora)	clustered bluets	G5		S3		+
Populus heterophylla	swamp cottonwood	G5		S2		+
Schwalbea americana	chaffseed	G2	E	S1	E(LP)	
Phoradendron serotinum	mistletoe	G5		S2	LP	

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COMMUNITIES and ECOSYSTEMS						
MARINE WETLAND COMMUNITIES						
Marine Subtidal Aquatic Bed		G5		SU		
Marine Intertidal Gravel/Sand Beach		G5		SU		
ESTUARINE WETLAND COMMUNITIES						
Freshwater Subtidal Aquatic Bed		G4		SU		
Tidal River		G4				+
Low Salt Marsh		G5		S5		+
High Salt Marsh		G5		S5		+
Salt Panne		G5		S5		+
Brackish Intertidal Shore		G3G4				
Brackish Intertidal Mudflats		G3G4				
Brackish Tidal Marsh		G4		S2?		+
Freshwater Intertidal Shore		G3G4				
Freshwater Intertidal Mudflats		G3G4				
Freshwater Tidal Marsh		G3G4		S3?		+
Freshwater Tidal Swamp		G2G3		S1S2		
Coastal Plain Pond (lacustrine)		G3G4				
PALUSTRINE WETLANDS						
Pine Barrens Shrub Swamp (palustrine)		G5		S5		
Coastal Plain Vernal Pond		G3?		S2S3		+
Pine Barren Savanna		G2		S2S3		
Pitch Pine Lowland Forest (palustrine)		G3		S3		
Cape May Lowland Swamp		G1		S1?		+
Coastal Plain Atlantic White Cedar Swamp		G3G4		S4?		+
Red Maple-Hardwood Swamp		G5		S5		+
TERRESTRIAL/UPLAND COMMUNITIES						
Maritime Dunes		G4				+
Coastal Dune Shrubland		G4		S2?		+
Coastal Dune Woodland		G2G3		S1		
Pine Plains		G1		S1		
Pitch Pine-Scrub Oak Barrens		G2				
Pitch Pine-Oak-Heath Woodland		G3G4				

Scientific Name	Common Name(s)	Global	Federal	NJ Rank	NJ Status	Cape May
ANIMAL CONCENTRATION AREAS						
Anadromous Fish Concentration						
Bald Eagle Wintering Site		G?		S?		+
Coastal Heron Rookery		GU		S3		+
Migratory Shorebird Concentration Site		G?		S?		+
Waterbird Nesting Colony						+
Raptor Concentration Area						+
Waterfowl Concentration Area						0

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Appendix F

Pre-Acquisition Compatibility Determination

Existing Wildlife-dependent Uses of Refuge Lands within New Refuge Acquisition Areas

STATION NAME: Cape May National Wildlife Refuge

DATE(S) ESTABLISHED: January 20, 1989

ESTABLISHING AND ACQUISITION AUTHORITIES:

The Cape May National Wildlife Refuge was created on January 20, 1989 administratively under authority of the Fish and Wildlife Act of 1956, (16 U.S.C. 742a-742j; 70 stat 1119), as amended.

PURPOSE(S) FOR WHICH ESTABLISHED:

For lands acquired under the Migratory Bird Conservation Act (16 U.S.C. 715-715r), as amended, the purpose of the acquisition is "...for uses as an inviolate sanctuary, or for any other management purpose, for migratory birds." Migratory Bird Conservation Act (16 U.S.C. 715d).
For lands acquired under the Fish and Wildlife Act of 1956 (16 U.S.C. 742(a) 754), as amended, the purpose of the acquisition is "... for the development, advancement, management, conservation, and protection of fish and wildlife resources..." (16 U.S.C. 742 (a)(4)) "... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." Fish and Wildlife Act of 1956 (16 U.S.C. 742f(b)(1)).

For lands acquired under the Emergency Wetlands Resources Act of 1986 (16 U.S.C. 3901(b)) "...the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions ...." Emergency Wetlands Resources Act of 1986 (16 U.S.C. 3901(b), 100 Stat. 3583).

OTHER APPLICABLE LAWS, REGULATIONS, AND POLICIES:

1. Antiquities Act of 1906 (34 STAT 225).
2. Migratory Bird Conservation Act of 1929 (16 U.S.C. 715r; 45 STAT 1222).
3. Refuge Recreation Act of 1962 (16 U.S.C. 460k 1-4; 76 STAT 653).
4. National Wildlife Refuge Administrative Act of 1966 (16 U.S.C. 668dd - 668ee; 80 STAT 927), as amended.
5. National Environmental Policy Act of 1969 (42 U.S.C. 4321, *et seq*; 83 STAT 852).
6. National Wildlife Refuge System Regulations in the Code of Federal Regulation (CFR)50 Subchapter C.
7. The Endangered Species Act of 1973 (16 U.S.C. 1531-1543; 87 STAT 884), as amended.
8. Executive Order 11990, Protection of Wetlands.
9. Wilderness Act of 1964 (16 U.S.C. 1121(note), 1131-1136).
10. Clean Air Act (42 U.S.C. 7401 *et seq*), as amended.

11. National Wildlife Refuge System Improvement Act of 1997 (P. L. 105-57).

DESCRIPTION OF PROPOSED USE:

Hunting, fishing, wildlife observation and photography, and environmental education and interpretation are defined as wildlife-dependent recreational uses by The National Wildlife Refuge System Improvement Act of 1997. This interim compatibility statement addresses only these uses.

ANTICIPATED IMPACTS OF THE USE:

The current levels of the six wildlife-dependent recreational uses defined in The National Wildlife Refuge System Improvement Act of 1997 (i.e., hunting, fishing, wildlife observation and photography, and environmental education and interpretation) in the proposed refuge expansion areas do not appear to be having any negative impacts on the habitat or wildlife within the areas.

DETERMINATION:

This use is compatible _X_ .

This use is not compatible ___ .

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

The parcel needs to be posted.

JUSTIFICATION:

See Anticipated Impacts of the Use:

NEPA COMPLIANCE:

CATEGORICAL EXCLUSION		
ENVIRONMENTAL ASSESSMENT	X	1988
ENVIRONMENTAL IMPACT STATEMENT		
FONSI	X	1989

The 1988 Environmental Assessment and 1989 Finding of No Significant Impacts (FONSI) for establishing the Cape May National Wildlife Refuge have been superceded by the July 2000 Revised Draft Environmental Assessment and Comprehensive Conservation Plan and March 2001 FONSI prepared for the Jersey Coastal Refuges.

REFUGE MANAGER: _____ DATE:_____

REVIEWED BY: _____ DATE:_____

Appendix G

Ecosystem services and functions (Costanza, et al. 1997)

Number	Ecosystem Service*	Ecosystem Functions	Examples
1	Gas regulation	Regulation of atmospheric chemical composition.	CO_2/O_2 balance, O_3 for UVB protection, and SO_X levels
2	Climate regulation	Regulation of global temperature, precipitation, and other biological mediated climatic processes at global or local levels.	Greenhouse gas regulations, DMS production affecting cloud formation.
3	Disturbance regulation	Capacitance, damping and integrity of ecosystem response to environmental fluctuations.	Storm protection, flood control, drought recovery and other aspects of habitat response to environment variability mainly controlled by vegetation structure.
4	Water regulation	Regulation of hydrological flows.	Provisioning of water for agricultural (such as irrigation) or industrial (such as milling) processes or transportation.
5	Water supply	Storage and retention of water.	Provisioning of water by watersheds, reservoirs, and aquifers.
6	Erosion control & sediment retention	Retention of soil within an ecosystem.	Prevention of loss of soil by wind, runoff, or other removal processes, storage of silt in lakes and wetlands.
7	Soil formation	Soil formation processes.	Weathering of rock and the accumulation of organic material.
8	Nutrient cycling	Storage, internal cycling, processing and acquisition of nutrients.	Nitrogen fixation, N.P. and other elemental or nutrient cycles.
9	Waste treatment	Recovery of mobile nutrients & removal or breakdown of excess or xenic nutrients & compounds.	Waste treatment, pollution control, detoxification.
10	Pollination	Movement of floral gametes.	Provisioning of pollinators for the reproduction of plant populations.
11	Biological control	Trophic-dynamic regulations of populations.	Keystone predator control of prey species, reduction of herbivory by top predators.
12	Refugia	Habitat for resident and transient populations.	Nurseries, habitat for migratory species, regional habitats for locally harvested species or overwintering grounds.

Number	Ecosystem Service*	Ecosystem Functions	Examples
13	Food production	That portion of gross primary production extractable as food.	Production of fish, game, crops, nuts, fruits by hunting, gathering, subsistence farming or fishing.
14	Raw materials	That portion of gross primary production extractable as raw materials.	The production of lumber, fuel or fodder.
15	Genetic resources	Sources of unique biological materials and products.	Medicine, products for materials science, genes of resistence to plant pathogens and crop pests, ornamental species (pets and horticultural varieties of plants).
16	Recreation	Providing opportunities for recreational activities.	Ecotourism, sport fishing, and other outdoor recreational activities.
17	Cultural	Providing opportunities for non-commercial uses.	Aesthetic, artistic, educational, spiritual, and/or scientific values of ecosystems.

Appendix H

Refuge Operating Needs System (RONS) Project List

Terms used in this appendix:

Startup cost: The project's estimated expenses for the first year (in year 2000 dollars X 1000)

Recurring cost: The project's estimated expenses for the second and following years (in year 2000 dollars X 1000)

15-year Total Cost: Estimated expenses for all projects over the 15-year duration of this CCP

Staff (FTEs): Full Time staffing Equivalent (one FTE is one person working full time for one year; seasonal staff are calculated as 0.5 FTE.)

Average FTE: The average additional FTEs required over the 15-year duration of this CCP, taking into to consideration that some projects have shorter durations (less than 15 years)

Table H-1. *Funding and staffing required for RONS projects for Cape May Refuge.*

	Startup Costs ($000)	Recurring Costs ($000)	15-year Total Cost ($000)	Average FTE
Cape May Refuge Total	**$1,685**	**$511**	**$6,449**	**19.5**

Table H-2. *RONS projects for Cape May Refuge.*

Start Year	Project Title: Cape May NWR	Startup Cost ($000)	Recurring Cost ($000)	15-year Total Cost ($000)	Staffing (FTEs)	Duration (years)
2001	Grassland Restoration and Management	50.4	5.7	129.9	0.3	15
2001	Restoration/Management of Early Succession Habitats	9.7	1.8	35.3	0.3	15
2001	Saltmarsh Restoration	73.3	73.3	1100.2	1	15
2001	Upland Forest Restoration and Management	46.1	46.1	692.2	0.5	15
2001	Invasive Species Control	11.8	11.8	177.0	0.5	15
2001	Invasive/Native Plant Species Survey	51.0	48.0	99.0	1	2
2001	Develop & Maintain Wildlife/Refuge Database/Archive	50.0	46.0	694.0	1	15

Start Year	Project Title: Cape May NWR	Startup Cost ($000)	Recurring Cost ($000)	15-year Total Cost ($000)	Staffing (FTEs)	Duration (years)
2001	Conduct Endangered Species Survey, Restoration, & Management	70.0	60.0	910.0	1	15
2001	Allow Upland Game hunting W of Rte 47 and N of Rte 550	20.0	20.0	300.0	0.3	15
2001	Develop Universally Accessible Trail at Headquarters	15.0	3.8	68.2	0.1	15
2001	Develop Interpretive Signage on Human Impacts to Wildlife	20.0		20.0	0.2	1
2001	Reprint General *Cape May NWR*	3.0	3.0	45.0		15
2001	Post & Patrol Newly Acquired Refuge Lands	83.0	58.0	895.0	1.5	15
2002	Nesting Bird Survey	53.0	49.0	249.0	1	5
2002	Develop Vegetation/Habitat Map	52.0	48.0	244.0	0.5	5
2002	Develop Parking and Kiosk for 35-mile State Trail	20.0	5.0	85.0	0.1	14
2002	Conduct Outreach and Education With Public	60.0	60.0	840.0	1	14
2002	Develop Teacher Training Workshops	22.0	22.0	308.0	0.2	14
2002	Enlarge Office Building and Develop a Visitor Contact Station	100.0	25.0	425.0	0.5	14
2003	Habitat Use by Migrating/Wintering Birds	90.0	57.0	318.0	1	5
2003	Conduct Technical Outreach on Land Protection & Management	52.0	48.0	628.0	1	13
2003	Monitor Migrating Shore, Song, and Sea Bird Populations	83.0	69.0	911.0	1	13
2003	Develop Interpretive Information on Shorebird Migration	10.0		10.0	0.2	1
2003	Print brochure *People's Impact on Wildlife*	1.1	1.1	14.3		13
2004	Small Vertebrate Survey (Mammals, Reptiles, Amphibians)	57.0	49.0	253.0	1	5
2004	Develop Schedule Nature Tours	30.0	30.0	360.0	0.7	12
2004	Construct Storage Building	100.0	25.0	375.0	0.5	12
2004	Produce *Birds of Cape May NWR*	4.2	3.3	40.5	0.1	12
2005	Produce trail map brochures for 5 new trails	6.0	3.0	36.0	0.1	11
2005	Remove seven buildings from Two-mile Beach Unit	625.0		625.0	1	1

Start Year	Project Title: Cape May NWR	Startup Cost ($000)	Recurring Cost ($000)	15-year Total Cost ($000)	Staffing (FTEs)	Duration (years)
2006	Monitor Public Use Activity and Impact	50.0	30.0	320.0	0.5	10
2006	Restore 60 acres of Barrier Island Habitat	120.0	20.0	160.0	0.3	3
2007	Develop Atlantic White Cedar Trail in Dennis Township	25.0	6.3	75.4	0.1	9
2007	Construct Maintenance Shop	250.0	62.5	750.0	1	9
2008	Construct Trail, Parking and Kiosk at Peach Orchard Rd	25.0	6.3	69.1	0.1	8
2009	Develop Parking Lot and Kiosk at Stocker Tract	25.0	6.3	62.8	0.1	7
2012	Initiate Permit Trapping North of Route 550	20.0	20.0	80.0	0.3	4
2012	Allow At-Large Fishing	40.0	40.0	160.0	0.3	4
2012	Develop New Trail, Parking Lot and Kiosk	25.0	6.3	43.9	0.1	4
2013	Develop Canoe Trail at Cedar Creek	25.0	6.3	37.6	0.1	3
	Cape May Subtotal	$1,685.3	$511.2	**$6,449.2**	**19.5**	

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Appendix I

Maintenance Management System (MMS) Project List

The Maintenance Management System (MMS) was established in 1982 to enhance Service-wide efforts in planning and budgeting for maintenance activities. The MMS database deals specifically with maintenance planning and budgeting. It serves to facilitate and standardize the documentation of backlogged maintenance needs - maintenance deficiencies which have gone uncorrected for 12 or more months since the deficiency arose due to lack of funding. Backlogged maintenance needs can include:

Repair and Rehabilitation - Work needed as a result of physical deterioration or functional obsolescence of buildings, other structures, facilities, or equipment. This category of maintenance may include projects that are to modify facilities for new functions, or to make improvements or additions (limited to 10% of GSF) to existing facilities to enhance their purpose or utility.

Facility and Equipment Replacement - Sometimes the most cost effective "repair" of a building, other facility, or equipment item is the replacement of it. To be eligible for listing in this MMS database, the proposed replacements must be of generally similar size and purpose. An ATV cannot replaced with a pickup truck. A dilapidated barn cannot be replaced with a new pole shed if the pole shed's size exceeds the barn's size by more than 110%.

Backlogged maintenance needs do not include:

New buildings, other facilities, or equipment - except when they are replacing dilapidated or obsolete items of similar size and kind. New items and major capital improvements are documented in Refuge Operations Needs (RONS) database.

Unfunded custodial maintenance needs - Routine or minor maintenance activities of a custodial nature. Examples include grass mowing, snow removal, grounds maintenance, janitorial services, minor plumbing, and light bulb or window glass replacement.

Habitat restoration, rehabilitation, or maintenance - MMS maintenance needs are restricted to facilities, structures, and equipment.

Projects or items under $5,000 - Items under $5000 are covered by the stations annual maintenance allocation.

Attached is a table of the current project backlog for the Cape May National Wildlife Refuge. The listing includes a project description and estimated cost.[1]

[1] The hard copy published in June 2004 lists the same items. Their sorting sequence and some of their estimated costs had changed by June 2005, when this Web document was published.

Refuge Maintenance Management System

STATION Cape May NWR **Orgcode** 52515 **Project** 98503 **Element** **Amount** $28,000.00
SAMMS WO 98104469

Title Rehabilitate Headquarters driveway and parking lot **Plan Yr.**

DOIRANK	REGIONAL RANK	STATION RANK	PropNumber	DMorEQ	BACKLOG	
350	500	1	10022105	TEA21	28	K$

FYCOMPLETED

Rehabilitate deteriorating concrete driveway apron, visitor walkway, twelve-space parking lot, and seventy foot-long gravel entrance road to the refuge office and visitor contact station facility. Driveway apron requires replacement so that vehicles do not scrape on over-sloped apron. Project would pave the driveway and parking lot and expand the lot size to accommodate 16 vehicles.

STATION Cape May NWR **Orgcode** 52515 **Project** 02003 **Element** **Amount** $330,000.00
SAMMS WO 02121335

Title Rehabilitate Two Mile Beach Unit Maintenance Shop **Plan Yr.** 2008

DOIRANK	REGIONAL RANK	STATION RANK	PropNumber	DMorEQ	BACKLOG	
250	174	4	10022119	Deferred	330	K$

FYCOMPLETED

Rehabilitate the 1360 sq. ft. maintenance shop building at the Two Mile Beach Unit. This military building is being used as a maintenance shop. Project includes repair and painting the stucco exterior, replace the flat roof with a sloped roof; replace rusty doors, repair the fire alarm system and repair the electrical, heating/cooling/ventilation, and plumbing systems. All of these repairs are necessary to provide safe working conditions and to properly maintain and store government property. Replacement needs to be considered since rehabilitation is the same cost as replacement.

STATION Cape May NWR **Orgcode** 52515 **Project** 02001 **Element** **Amount** $427,000.00
SAMMS WO 02121359

Title Rehabilitate Office Building - Two Mile Beach Unit - Phase 1 **Plan Yr.** 2005 dm

DOIRANK	REGIONAL RANK	STATION RANK	PropNumber	DMorEQ	BACKLOG	
640	888	99	10022114	Deferred	427	K$

FYCOMPLETED

Rehabilitate sub office facility transferred by the U.S. Coast Guard to the refuge. This 5,300 sq. ft. facility is presently the sub-headquarters. Project would involve rehabilitation and repair unsafe electrical (no GFI) , heating/ventilation/air conditioning system that has leaks, plumbing, fire/security alarm, and remove walls for conference room space. There is presently a mold problem. Utility company has stated that the powering system has water damage, moisture and corrosion problems in the powering unit. Transformers has been replaced due to failure of the existing transformers. Project will provide a safe secure facility for staff at a location where the greatest number of public contacts are anticipated.

STATION Cape May NWR **Orgcode** 52515 **Project** 02002 **Element** **Amount** $427,000.00
SAMMS WO 02121360

Title Rehabilitate Visitor Contact Building - Two Mile Beach Unit - Phase 2 **Plan Yr.** 2005 dm

DOIRANK	REGIONAL RANK	STATION RANK	PropNumber	DMorEQ	BACKLOG	
390	888	99	10022114	Deferred	427	K$

FYCOMPLETED

Rehabilitate sub-office/visitor contact facility (A14) transferred by the U.S. Coast Guard in 1999. Rehabilitate the visitor contact half of this facility for unsafe ADA access structures, visitor entrance facilities, and rehabilitate for sprinkler system required by code. Project will facilitate resource protection and habitat enhancement for endangered species, shorebirds, and other migratory birds. Project will provide a safe secure facility for visitor contacts and environmental education programs.

STATION Cape May NWR **Orgcode** 52515 **Project** 01006 **Element** **Amount** $104,000.00
SAMMS WO 01

Title Construct Platforms, Kiosks and Signs at Two Mile Beach Unit **Plan Yr.** 2005vfe1261

DOIRANK	REGIONAL RANK	STATION RANK	PropNumber	DMorEQ	BACKLOG	
100	888	99	10022107	Small Construction	96	K$

FYCOMPLETED

Construct two viewing platforms, gates, fencing and regulatory signs at the Two Mile Beach unit to provide new public use opportunities. Project provides refuge access and wildlife dependent recreational opportunities. Issues regarding visitor access to this refuge beach have been controversial. Project will fulfill promises made to the public in June 2001, with first phases of public access beginning in April 2002.

Refuge Maintenance Management System

STATION Cape May NWR **Orgcode** 52515 **Project** 03002 **Element** **Amount** $501,000.00
SAMMS WO 03126223

Title Resurface entrance road and parking lots - TMBU **Plan Yr.**

DOIRANK	REGIONAL RANK	STATION RANK	PropNumber	DMorEQ	BACKLOG	
460	999	8	10022130	TEA21	501	K$

FYCOMPLETED

Rehabilitate one mile of asphalt road and five parking lots at the Two Mile Beach Unit. Roads and parking lots are cracked and potholes have formed. These facilities are used by increasingly numbers of visitors and require rehabilitation. New paint striping will be necessary on the entrance road and public use parking lots.

STATION Cape May NWR **Orgcode** 52515 **Project** 03003 **Element** **Amount** $444,000.00
SAMMS WO 03126261

Title Replace Two Sewer Lift Stations **Plan Yr.** 2010

DOIRANK	REGIONAL RANK	STATION RANK	PropNumber	DMorEQ	BACKLOG	
500	113	3	10022126	Deferred	444	K$

FYCOMPLETED

Replace two aging and worn-out sewer lift stations. The lift stations are old and require frequent repairs and maintenance. The lift stations are necessary for the operation of Refuge facilities, including the Visitor Contact Station, and also the adjacent Coast Guard Base. The Refuge has certain responsibilities for the infrastructure shared with the Coast Guard. Nonfunctioning lift station is a health hazard and the facility has to be shut down until repairs are completed.

STATION Cape May NWR **Orgcode** 52515 **Project** 03004 **Element** **Amount** $43,000.00
SAMMS WO 03126275

Title Rehabilitate Exterior and Interior of 946 Hand Avenue Residence/Quarters **Plan Yr.**

DOIRANK	REGIONAL RANK	STATION RANK	PropNumber	DMorEQ	BACKLOG	
635	282	11	10042837	Deferred	43	K$

FYCOMPLETED

Rehabilitate exterior and interior of government quarters at 946 Hand Avenue. Residence is used by law enforcement staff. The house was built in 1975 and no maintenance has been done for over 30 years. On the exterior, repair/repoint chimney for fire safety, replace well pump and repaint the exterior, replace asphalt shingle roof, replace broken windows/screens and rotted sills. On the interior replace old mildew stained carpet, repair fireplace, install hard-wired smoke alarms to meet fire safety requirements. Replace broken old warped kitchen cabinets.

STATION Cape May NWR **Orgcode** 52515 **Project** 03005 **Element** **Amount** $181,000.00
SAMMS WO 03126286

Title Rehabilitate Refuge Headquarters Office Building **Plan Yr.**

DOIRANK	REGIONAL RANK	STATION RANK	PropNumber	DMorEQ	BACKLOG	
490	800	13	10022104	Deferred	181	K$

FYCOMPLETED

Rehabilitate the aging headquarters office building. The headquarters requires extensive rehabilitation to correct maintenance deficiencies. Without rehabilitation the facility will further degrade and become substandard. Project includes: replacement of wood shingle roof with asphalt shingles, exterior painting, replacement of water damaged subfloor, replacement of worn out carpeting, replacement of air conditioning units, replacement of broken interior doors, replacement of subfloor insulation, and making the visitor contact area accessible to all visitors. The headquarters office is the primary location for visitor contacts and currently provides office space for three staff.

STATION Cape May NWR **Orgcode** 52515 **Project** 03006 **Element** **Amount** $313,000.00
SAMMS WO 03126387

Title Rehabilitate saltmarsh trail **Plan Yr.**

DOIRANK	REGIONAL RANK	STATION RANK	PropNumber	DMorEQ	BACKLOG	
400	280	10	10036186	Deferred	313	K$

FYCOMPLETED

Rehabilitate the degraded trail into the salt marsh at the Two Mile Beach Unit. The existing trails are overgrown with vegetation and eroding. They are substandard, unsafe, and unusable. The existing blind is rotted and old. All trail sections will require clearing of the brush, reestablishment of the trail with gravel base and stone dust surface for accessible use. Eroded sections require additional fill and gravel surfacing material. The project would include a section of a boardwalk for accessibility and viewing platform.
The project would provide visitors a renewed opportunity to view the saltmarsh habitat and abundant migratory birds.

Refuge Maintenance Management System

STATION	Cape May NWR	**Orgcode**	52515	**Project**	03007	**Element**		**Amount**	$47,000.00
				SAMMS WO	03130612				

Title Replace Canoe/Kayak Ramp at Tract 942, Great Cedar Swamp Div. **Plan Yr.**

DOIRANK	REGIONAL RANK	STATION RANK	PropNumber	DMorEQ	BACKLOG	K$
440	284	12	10050001	Deferred	47	

FYCOMPLETED

Replace washed out dirt canoe/kayak ramp with a low profile wooden stationary deck, approximately 8 feet wide and 20 feet long located at the high tide line. Rehabilitate dirt access road and six vehicle parking area by placing fill dirt to meet grade of adjacent highway surface and placing crushed stone on access road and parking area. Rehabilitate existing dirt trail by grading and placing crush stone. Replace existing broken and rusted gate with metal pole gate. Place bollards at start of access trail to prevent vehicles from driving down to the launching deck. Replacement and rehabilitation of this ramp will provide public use access for fishing, canoing and kayaking and will prevent access to motorized watercraft.

Total Amount of Found Set	$2,845.00
Running Back Log of Found Set	$2,837.00

Appendix J

Glossary

alternative – a reasonable way to fix the identified problem or satisfy the stated need (40 CFR 1500.2) [see also *management alternative* below].

amphidromous fish – fish that can migrate from fresh water to the sea, or vice versa, not for the purpose of breeding, but at other times during the life cycle of the fish.

anadromous – fish that spend a large proportion of their life cycle in the ocean and return to freshwater to breed.

aquatic barrier – any obstruction to fish passage.

aquatic – growing in, living in, or dependent upon water.

biological integrity – composition, structure, and function at the genetic, organism, and community levels consistent with natural conditions, and the biological processes that shape genomes, organisms, and communities.

biological or natural diversity – the abundance, variety, and genetic constitution of animals and plants in nature. Also referred to as "biodiversity."

breeding habitat – habitat used by migratory birds or other animals during the breeding season.

buffer zones – protective land borders around critical habitats or water bodies that reduce runoff and nonpoint source pollution loading; areas created or sustained to lessen the negative effects of land development on animals and plants and their habitats.

candidate species – those species for which the Service has on file sufficient information on biological vulnerability and threats to propose them for listing.

carrying capacity-the size of the population that can be sustained by a given environment.

catadromous fish – fish that spend most of their lives in fresh water but migrate to sea to reproduce.

Categorical Exclusion (CE, CX, CATEX, CATX) - a category of actions that do not individually or cumulatively have a significant effect on the human environment and have been found to have no such effect in procedures adopted by a Federal agency pursuant to the National Environmental Policy Act (40 CFR 1508.4).

CFR – Code of Federal Regulations.

Challenge Grant Cost Share Program – a grant program administered by the Fish and Wildlife Service providing matching funds for projects supporting natural resource education, management, restoration and protection on Service lands, other public lands and on private lands.

community - the area or locality in which a group of people resides and shares the same government.

community type – a particular assemblage of plants and animals, named for the characteristic plants.

compatible use – an allowed use that will not materially interfere with, or detract from, the purposes for which the unit was established (Service Manual 602 FW 1.4).

compatibility determination – a compatibility determination is required for a wildlife-dependant recreational use or any other public use of a refuge. A compatible use is one which, in the sound professional judgement of the Refuge Manager, will not materially interfere with or detract from fulfillment of the Refuge System Mission or refuge purpose(s)

Comprehensive Conservation Plan (CCP) – a document that describes the desired future conditions of a refuge or planning unit and provides long-range guidance and management direction to achieve the purposes of the refuge, help fulfill the mission of the System, maintain and, where appropriate, restore the biological integrity, diversity, and environmental health of each refuge and the System, and meet other mandates.

concern – see *issue*.

conservation – the management of natural resources to prevent loss or waste. Management actions may include preservation, restoration, and enhancement.

conservation agreements – written agreements reached among two or more parties for the purpose of ensuring the survival and welfare of unlisted species of fish and wildlife and/or their habitats, or to achieve other specified conservation goals. Participants voluntarily commit to implementing specific actions that will remove or reduce the threats to these species.

conservation easement – a legal agreement between a landowner and a land trust (a private, nonprofit conservation organization) or government agency that permanently limits a property's uses in order to protect its conservation values.

cooperative agreement – the legal instrument used when the principal purpose of the transaction is the transfer of money, property, services or anything of value to a recipient in order to accomplish a public purpose authorized by Federal statute and substantial involvement between the Service and the recipient is anticipated.

cultural resources – evidence of historic or prehistoric human activity, such as buildings, artifacts, archaeological sites, documents, or oral or written history.

cultural resource inventory – a professionally conducted study designed to locate and evaluate evidence of cultural resources present within a defined geographic area. Inventories may involve various levels, including background literature search, comprehensive field examination to identify all exposed physical manifestations of cultural resources, or sample inventory to project site distribution and density over a larger area. Evaluation of identified cultural resources to determine eligibility for the National Register follows the criteria found in 36 CFR 60.4 (Service Manual 614 FW 1.7).

cultural resource overview – a comprehensive document prepared for a field office that discusses, among other things, its prehistory and cultural history, the nature and extent of known cultural resources, previous research, management objectives, resource management conflicts or issues, and a general statement on how program objectives should be met and conflicts resolved. An overview should reference or incorporate

information form a field offices background or literature search described in Section VIII. of the Cultural Resource Management Handbook (Service Manual 614 FW 1.7).

database – a collection of data arranged for ease and speed of analysis and retrieval, usually computerized.

diadromous – fish that migrate from freshwater to saltwater or the reverse: a generic term that includes anadromous, catadromous and amphidromous fishes.

digitizing – the process of converting information from paper maps into geographically referenced electronic files for a geographic information system (GIS).

easement – an agreement by which a landowner gives up or sells one of the rights on his/her property. For example, a landowner may donate a right of way across his/her property to allow community members access.

ecosystem – a biological community together with its environment, functioning as a unit. For administrative purposes, the Service has designated 53 ecosystems covering the United States and its possessions. These ecosystems generally correspond with watershed boundaries and vary in their sizes and ecological complexity.

ecotourism – a type of tourism that maintains and preserves natural resources as a basis for promoting economic growth and development resulting from visitation to an area.

ecosystem approach – a way of looking at socio-economic and environmental information based on ecosystem boundaries, rather than town, city, or county boundaries.

ecosystem-based management – an approach to making decisions based on the characteristics of the ecosystem in which a person or thing belongs. This concept takes into consideration interactions between the plants, animals, and physical characteristics of the environment when making decisions about land use or living resource issues.

ecosystem services - the benefits human populations derive, directly or indirectly, from ecosystem functions (e.g., gas regulation, disturbance regulation, soil formation, pollination, raw materials).

emergent wetland – wetlands dominated by erect, rooted, herbaceous plants.

endangered species – a federally protected species which is in danger of extinction throughout all or a significant portion of its range.

environmental education – education aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution (Stapp et al. 1969).

Environmental Assessment (EA) – A concise public document, prepared in compliance with the National Environmental Policy Act, that briefly discusses the purpose and need for an action, alternatives to such action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an environmental impact statement or finding of no significant impact (40 CFR 1508.9).

Environmental Impact Statement (EIS) – A detailed written statement required by section 102(2)(C) of the National Environmental Policy Act, analyzing the environmental impacts of a proposed action, adverse effects of the project that cannot be avoided, alternative courses of action, short-tern uses of the

environment versus the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitment of resources (40 CFR 1508.11).

estuaries – deepwater tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land but have open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land.

estuarine wetlands – "The Estuarine system consists of deepwater tidal habitats and adjacent tidal wetlands that are usually semienclosed by land but have open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land." (Cowardin et al. 1979)

exemplary community type – an outstanding example of a particular community type.

extirpated – no longer occurring in a given geographic area.

federal land – public land owned by the Federal government, including lands such as National Forests, National Parks and National Wildlife Refuges.

federally listed species – a species listed under the federal Endangered Species Act of 1973, as amended, either as endangered, threatened or species at risk (formerly candidate species).

Finding of No Significant Impact (FONSI) – A document prepared in compliance with the National Environmental Policy Act, supported by an environmental assessment, that briefly presents why a Federal action will have no significant effect on the human environment and for which an environmental impact statement, therefore, will not be prepared (40 CFR 1508.13).

forbs – A flowering plant, excluding grasses, sedges, and rushes, that does not have a woody stem and dies back to the ground at the end of the growing season.

forested land – land dominated by trees. For the purposes of the impacts analysis in this document, all forested land was assumed to have the potential to be occasionally harvested, and forested land owned by timber companies was assumed to be harvested on a more intensive, regular schedule.

forested wetlands – wetlands dominated by trees.

geographic information system (GIS) – a computerized system used to compile, store, analyze and display geographically referenced information. Can be used to overlay information layers containing the distributions of a variety of biological and physical features.

goal – descriptive, open-ended, and often broad statement of desired future conditions that conveys a purpose but does not define measurable units.

grant agreement – the legal instrument used when the principal purpose of the transaction is the transfer of money, property, services or anything of value to a recipient in order to accomplish a public purpose of support or stimulation authorized by Federal statute and substantial involvement between the Service and the recipient is not anticipated.

habitat fragmentation – breaking up of a specific habitat into smaller unconnected areas. A habitat area that is too small may not provide enough space to maintain a breeding population of the species in question.

habitat conservation – the protection of an animal or plant's habitat to ensure that the use of that habitat by the animal or plant is not altered or reduced.

habitat – the place where a particular type of plant or animal lives. An organism's habitat must provide all of the basic requirements for life and should be free of harmful contaminants.

hydrologic or flow regime – characteristic fluctuations in river flows.

Integrated Pest Management (IPM) - sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools in a way that minimizes economic, health, and environmental risks.

interjurisdictional fish – populations of fish that are managed by two or more states or national or tribal governments because of the scope of their geographic distributions or migrations.

interpretive facilities – structures that provides information about an event, place or thing by a variety of means including printed materials, audiovisuals or multimedia materials. Examples of these would be kiosks which offer printed materials and audiovisuals, signs and trailheads.

interpretive materials – any tool used to provide or clarify information, explain events or things, or serve to increase awareness and understanding of the events or things. Examples of these would be: (1) printed materials such as brochures, maps or curriculum materials; (2) audio/visual materials such as videotapes, films, slides, or audio tapes; and (3) interactive multimedia materials, such as cd–rom and other computer technology.

invasive exotic species – non-native species which have been introduced into an ecosystem, and, because of their aggressive growth habits and lack of natural predators, displace native species.

grassroots conservation organization – any group of concerned citizens who come together to actively address a conservation need.

habitat macrosites - an area important because of the presence of rare species, ecological communities, and functioning ecosystems.

issue – any unsettled matter that requires a management decision; e.g., a Service initiative, an opportunity, a management problem, a threat to the resources of the unit, a conflict in uses, a public concerns, or the presence of an undesirable resource condition. Issues should be documented, described, and analyzed in the CCP even if resolution cannot be accomplished during the planning process (Service Manual 602 FW 1.4). See also: *key issue*.

key issue – an issue meeting the following three criteria:

1. Falls within the jurisdiction of the Service;

2. Can be addressed by a reasonable range of alternatives;

3. Influences the outcome of the project.

land trusts – organizations dedicated to conserving land by purchasing land, receiving donations of lands, or accepting conservation easements from landowners.

limiting factor – an environmental limitation that prevents further population growth.

local agencies – generally referring to municipal governments, regional planning commissions or conservation groups.

long term protection – mechanisms such as fee title acquisition, conservation easements or binding agreements with landowners that ensure land use and land management practices will remain compatible with maintenance of the species population at the site.
management alternative – a set of objectives and the strategies needed to accomplish each objective (Service Manual 602 FW 1.4).

management concern – see *issue*.

management opportunity – see *issue*.

management plan – a plan that guides future land management practices on a tract of land. In the context of this environmental impact statement, management plans would be designed to produce additional wildlife habitat along with the primary products, such as timber or agricultural crops. See cooperative agreement.

management strategy – a general approach to meet unit objectives. A strategy may be broad, or it may be detailed enough to guide implementation through specific actions, tasks, and projects (Service Manual 602 FW 1.4).

migratory game birds - birds regulated under the Migratory Bird Treaty Act and state laws, that are legally hunted, includes ducks, geese, woodcock, rails.

minimum tool rule - Apply only the minimum impact policy, device, force, regulation, or practice to bring about a desired result. Achieve results using the most "light-handed" approach (Hendee, 1990).

mission statement – succinct statement of the unit's purpose and reason for being (Region 7 Planning Staff).

mitigation – actions taken to compensate for the negative effects of a particular project. Wetland mitigation usually takes the form of restoration or enhancement of a previously damaged wetland or creation of a new wetland.

National Environmental Policy Act of 1969 (NEPA) – requires all agencies, including the Service, to examine the environmental impacts of their actions, incorporate environmental information, and use public participation in the planning and implementation of all actions. Federal agencies must integrate NEPA with other planning requirements, and prepare appropriate NEPA documents to facilitate better environmental decision making (from 40 CFR 1500).

National Wildlife Refuge (Refuge) – "A designated area of land, water, or an interest in land or water within the System, but does not include Coordination Areas." Find a complete listing of all units of the System in the current *Annual Report of Lands Under Control of the U.S. Fish and Wildlife Service*.

National Wildlife Refuge System (Refuge System) – all lands and waters and interests therein administered by the Service as wildlife refuges, wildlife ranges, wildlife management areas, waterfowl production areas, and other areas for the protection and conservation of fish and wildlife, including those that are threatened with extinction.

National Wildlife Refuge System Mission (mission) – "The mission of the System is to administer a national network of lands and waters for the conservation, management and, where appropriate, restoration

of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans."

native plant – a plant that has grown in the region since the last glaciation and occurred before European settlement.

non-consumptive, wildlife-oriented recreation – photographing or observing plants, fish and other wildlife.

non-point source pollution – nutrients or toxic substances that enter water from dispersed and uncontrolled sites.

nonforested wetlands – wetlands dominated by shrubs or emergent vegetation.

Notice of Intent (NOI) – a notice that an environmental impact statement will be prepared and considered (40 CFR 1508.22). Published in the Federal Register.

Objective – a concise statement of what we want to achieve, how much we want to achieve, when and where we want to achieve it, and who is responsible for the work. Objectives derive from goals and provide the basis for determining strategies, monitoring refuge accomplishments, and evaluating the success of strategies. Make objectives attainable, time-specific, and measurable.

occurrence site – a discrete area where a population of a rare species lives or a rare plant community type grows.

old field – an area that was formerly cultivated or grazed and where woody vegetation has begun to invade. If left undisturbed, it will eventually succeed into a forest. Many old fields occur at sites marginally suitable for crop production or pasturing. Old fields are highly variable in the Northeast, depending on soil, land use history, and management.

Open Marsh Water Management (OMWM) - a mosquito control technique that improves habitat conditions in salt marshes for mosquito-eating fish by creating ponds that will maintain the fish between lunar tides.

palustrine wetlands – "The Palustrine system includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean–derived salts is below 0%." (Cowardin et al. 1979)

Partners for Wildlife Program – a voluntary habitat restoration program undertaken by the Fish and Wildlife Service in cooperation with other governmental agencies, public and private organizations, and private landowners to improve and protect fish and wildlife habitat on private lands while leaving the land in private ownership.

partnership – a contract or agreement entered into by two or more individuals, groups of individuals, organizations or agencies in which each agrees to furnish a part of the capital or some in–kind service, i.e., labor, for a mutually beneficial enterprise.

population monitoring – assessments of the characteristics of populations to ascertain their status and establish trends related to their abundance, condition, distribution, or other characteristics.

prescribed fire – the application of fire to wildland fuels to achieve identified land use objectives (Service

Manual 621 FW 1.7), either from natural or intentional ignition.

priority public uses – see *wildlife-dependant recreational uses*.

private land – land that is owned by a private individual, group of individuals, or non– governmental organization.

private landowner – any individual, group of individuals or non–governmental organization that owns land.

private organization – any non–governmental organization.

Proposed Action – activities for which an Environmental Assessment is being written; the alternative containing the actions and strategies recommended by the planning team. The proposed action is, for all practical purposes, the draft CCP for the refuge.

protection – mechanisms such as fee title acquisition, conservation easements or binding agreements with landowners that ensure land use and land management practices will remain compatible with maintenance of the species population at the site.

public – individuals, organizations, and groups; officials of Federal, State, and local government agencies; Indian tribes; and foreign nations. It may include anyone outside the core planning team. It includes those who may or may not have indicated an interest in the Service issues and those who do or do not realize that Service decisions may affect them.

public involvement – a process that offers impacted and interested individuals and organizations an opportunity to become informed about, and to express their opinions on Service actions and policies. In the process, these views are studied thoroughly and thoughtful consideration of public views is given in shaping decisions for refuge management.

public involvement plan – broad long term guidance for involving the public in the comprehensive planning process.

public land – land that is owned by the local, state, or Federal government.

rare species – species identified in Appendix 3–6 as Species of Special Emphasis due to their uncommon occurrence within the watershed.

rare community types – plant community types classified as rare by any of the four state Natural Heritage Programs. As used in this environmental impact statement, is inclusive of the exemplary community types. The types are listed in Appendix 3-4.

Record of Decision (ROD) – a concise public record of decision prepared by the Federal agency, pursuant to NEPA, that contains a statement of the decision, identification of all alternatives considered, identification of the environmentally preferable alternative, a statement as to whether all practical means to avoid or minimize environmental harm from the alternative selected have been adopted (and if not, why they were not), and a summary of monitoring and enforcement where applicable for any mitigat CFR 1505.2).

refuge goals – descriptive, open-ended and often broad statements of desired future conditions that convey a purpose but do not define measurable units (Writing Refuge Management Goals and Objectives: A Handbook).

refuge purposes – the purposes specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing, authorizing, or expanding a refuge, a refuge unit, or refuge subunit, and any subsequent modification of the original establishing authority for additional conservation purposes (Service Manual 602 FW 1.4).

refuge lands – those lands in which the Service holds full interest in fee title, or partial interest such as easements.

Refuge Operating Needs System (RONS) – the Refuge Operating Needs System is a national database which contains the unfunded operational needs of each refuge. We include projects required to implement approved plans, and meet goals, objectives, and legal mandates.

restoration – the artificial manipulation of a habitat to restore it to something close to its natural state. Involves taking a degraded grassland and re-establishing habitat for native plants and animals. Restoration usually involves the planting of native grasses and forbs, and may include shrub removal and prescribed burning.

runoff – water from rain, melted snow, or agricultural or landscape irrigation that flows over the land surface into a water body.

Service presence – the existence of the Service through its programs and facilities which it directs or shares with other organizations; the public awareness of the Service as a sole or cooperative provider of programs and facilities.

species of concern – Species present in the watershed for whom the Refuge has a special management interest. The following criteria were used to identify "species of concern":

1. Federally listed as threatened or endangered;

2. migratory bird, especially declining species, Neotropical migrants, colonial waterbirds, shorebirds, or waterfowl;

3. marine mammal;

4. sea turtle;

5. interjurisdictional fish;

6. State-listed as threatened, endangered, or special concern..

state land – public land owned by a state such as state parks or state wildlife management areas.

step-down management plans – step-down management plans describe management strategies and implementation schedules. Step-down management plans are a series of plans dealing with specific management subjects (e.g., croplands, wilderness, and fire) (Service Manual 602 FW 1.4).

stopover habitat – habitat used during bird migration for rest and feeding.

strategy – a specific action, tool, technique, or combination of actions, tools, and techniques used to meet unit objectives.

threatened species – a federally protected species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

tributary – a stream or river that flows into a larger stream, river or lake.

trust resource – one that through law or administrative act is held in trust for the people by the government. A federal trust resource is one for which trust responsibility is given in part to the federal government through federal legislation or administrative act. Generally, federal trust resources are those considered to be of national or international importance no matter where they occur, such as endangered species and species such as migratory birds and fish that regularly move across state lines. In addition to species, trust resources include cultural resources protected through federal historic preservation laws, nationally important and threatened habitats, notably wetlands, navigable waters, and public lands such as state parks and National Wildlife Refuges.

unfragmented habitat – large blocks of unbroken habitat of a particular type.

unit objective – desired conditions which must be accomplished to realize a desired outcome. Objectives are the basis for determining management strategies, monitoring refuge accomplishments, and measuring the success of the strategies. Objectives should be attainable and time-specific and may be stated quantitatively or qualitatively (Service Manual 602 FW 1.4).

universally accessible – a universally accessible recreation site is designed to accommodate people with physical disabilities. Interpretive materials at such a sight would be accessible to the visually impaired.

upland – dry ground; other than wetlands.

U.S. Fish and Wildlife Service Mission – our mission is to work with others to "conserve, protect, and enhance fish and wildlife, and their habitat for the continuing benefit of the American people."

vernal pool – depressions holding water for a temporary period in the spring and used by a variety of amphibians for egg laying.

vision statement – concise statement of what the unit could be in the next 10 to 15 years (Region 7 Planning Staff).

visitor center – a permanently staffed building offering exhibits and interpretive information to the visiting public. Some visitor centers are co-located with refuge offices, other include additional facilities such as classrooms or wildlife viewing areas.

visitor contact station – compared to a visitor center, a contact station is a smaller facility which may not be permanently staffed.

watchable wildlife – all wildlife is watchable. A watchable wildlife program is a strategy to help maintain viable populations of all native fish and wildlife species by building an effective, well– informed constituency for conservation. Watchable wildlife programs are tools by which wildlife conservation goals can be met while at the same time fulfilling public demand for wildlife recreational activities (other than sport hunting, trapping or sport fishing).

watershed – the geographic area within which water drains into a particular river, stream or body of water. A watershed includes both the land and the body of water into which the land drains.

wet meadow – meadows located in moist low-lying areas, most often dominated by large colonies of reed

canary grass. They are often created by collapsed beaver dams and exposed old pond bottoms. Salt marsh meadows are subject to daily coastal tides.

wetlands – The U.S. Fish and Wildlife Service's definition of wetlands states that "Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water." (Cowardin et al 1979)

wilderness - The legal definition is found in the Wilderness Act of 1964 Section 2c (P.L. 88-577): "A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain." This legal definition places wilderness on the "untrammeled" or "primeval" end of the environmental modification spectrum. Wilderness is roadless lands, legally classified as component areas of the National Wilderness Preservation System, and managed so as to protect its qualities of naturalness, solitude and opportunity for primitive types of recreation (Hendee, 1990).

wilderness management - Government and citizen activity to identify–within the constraints of the Wilderness Act–goals and objectives for classified wildernesses and the planning, implementation, and administration of policies and management actions to achieve them. Involves the application of guidelines and principles to achieve established goals and objectives, including management of human use and influences to preserve naturalness and solitude (Hendee, 1990).

wildlife-dependent recreational use – "A use of a refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation." These are the six priority public uses of the System as established in the National Wildlife Refuge System Administration Act, as amended. Wildlife-dependent recreational uses, other than the six priority public uses, are those that depend on the presence of wildlife. We also will consider these other uses in the preparation of refuge CCPs, however, the six priority public uses always will take precedence.

wildlife management – the practice of manipulating wildlife populations, either directly through regulating the numbers, ages, and sex ratios harvested, or indirectly by providing favorable habitat conditions and alleviating limiting factors.

Appendix K

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Appendix L

List of Preparers

Members of the Jersey Coast Refuges Planning Team

Mr. William Archambault
Former NEPA Coordinator
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, Massachusetts 01035-9589

Mr. Stephen Atzert
Former Refuge Manager
Edwin B. Forsythe and Cape May NWR
Great Creek Road
Oceanville, New Jersey 08231

Ms. Allison Banks
Former Wildlife Biologist
U.S. Fish and Wildlife Service (RE)
134 Union Boulevard
Lakewood, Colorado 80228

Mr. Tracy Casselman
Former Deputy Refuge Manager
Edwin B. Forsythe and Cape May NWR
Great Creek Road
Oceanville, New Jersey 08231

Mr. Gilbert Chase
Wildlife Biologist
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, Massachusetts 01035-9589

Mr. Kevin Gormley
Law Enforcement Officer
Edwin B. Forsythe NWR
70 Collinstown Road
Barnegat, New Jersey 08005

Mr. Jeffrey King
Former Barnegat Division Manager
Edwin B. Forsythe NWR
PO Box 544, 70 Collinstown Rd.
Barnegat, New Jersey 08005

Mr. Leon Latino
Former Assistant Planner
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, Massachusetts 01035-9589

Mr. Bruce Luebke
Assistant Refuge Manager
Cape May NWR
Kimbles Beach Road
Cape May Court House, New Jersey 08210

Mr. Edward J. McCarthy
Volunteer
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, Massachusetts 01035-9589

Mr. Norman Olson
Former Chief, Division of Planning
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, Massachusetts 01035-9589

Mr. Anthony Petrongolo
Chief, Bureau of Land Management
New Jersey Division of Fish and Wildlife
P.O. Box 400
Trenton, New Jersey 08625-0400

Ms. Linda Rubenstein
Former Outdoor Recreation Planner
Edwin B. Forsythe NWR
Great Creek Road
Oceanville, New Jersey 08231

Mr. Rick Schauffler
Biologist/GIS Specialist
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, Massachusetts 01035-9589

Mr. Paul Steblein
Former Wildlife Biologist
Edwin B. Forsythe NWR
Great Creek Road
Oceanville, New Jersey 08231

Mr. Vincent Turner
Wildlife Biologist
Edwin B. Forsythe NWR
70 Collinstown Road
Barnegat, New Jersey 08005

Ms. Mary Varteresian
Former Wildlife Biologist
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, Massachusetts 01035-9589

Ms. Alison Whitlock
Former Wildlife Biologist
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, Massachusetts 01035-9589

Appendix M

Land Protection Plan

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A. Introduction

The U.S. Fish and Wildlife Service has completed its Comprehensive Conservation Planning Process for the Cape May National Wildlife Refuge (NWR). In the resulting Comprehensive Conservation Plan (CCP), the "Action Alternative" that the Service has selected includes expanding the Cape May NWR acquisition area.

The Purpose of this Land Protection Plan (LPP) is to provide landowners and municipal, county and state officials an outline of the Service's policies, priorities and potential methods for protecting the land within this expanded refuge acquisition area.

B. Project Description

The Cape May NWR is located in Cape May County, New Jersey. The refuge expansion area includes a mixture of beaches, marsh, forested wetlands, upland forests, and upland fields. The refuge acquisition boundary will be expanded by 3,591 acres, including 1,627 acres in Upper Township, 960 acres in Dennis Township, 1,216 acres in Middle Township, and 546 acres in Lower Township.

C. Threats to Resources

The Cape May peninsula, until fairly recently, was a relatively rural, agricultural area. Isolated in the extreme southern portion of the State, the area's economy was based on its seasonal tourism industry, fishing and shellfishing, 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 Cape May County. This type of growth, coupled with expansion of the tourism industry, now threatens the ecological integrity of remaining fish and wildlife habitat.

D. Proposed Action and Objectives

The Service proposes to acquire 3,591 additional acres to provide long-term protection to the numerous species of shorebirds, neotropical migratory landbirds, waterfowl, long-legged waders, woodcock, raptors, finfish and shellfish, and threatened and endangered species that use Cape May Peninsula. The objectives are to protect:

1. Known sites of threatened or endangered species and communities;
2. Areas important to the ecological health of lands already owned (to ensure intact ecosystem processes, protect the quality and quantity of water for wetlands, provide habitat corridors between existing conservation lands, or protect sufficient contiguous acreage to support viable wildlife populations);
3. Areas important for priority wildlife species (e.g., critical stopover habitat for migrating birds);
4. Areas identified as priority sites for protection by other conservation organizations; and
5. Areas still viable for conservation protection (i.e., not already developed).

E. Protection Alternatives

This section describes and evaluates four land protection alternatives for protecting the biological resources in the Cape May NWR Land Protection Focus Area shown on maps 2-16a & 2-16b of the Edwin B. Forsythe and Cape May National Wildlife Revised Draft Comprehensive Conservation Plan and Environmental Assessment (U.S. Fish and Wildlife Service, July 2000). It is the Service's policy is to acquire only the minimum interest necessary to meet refuge objectives.

1. No Action Alternative

Under the "No Action" alternative, the Service would rely on existing Federal, State, and local land use regulations to preserve the wildlife values of the Land Protection Focus Areas. We would provide technical assistance on Federally regulated species, particularly through Section 7 consultation provided under the Endangered Species Act. Under this alternative, a substantial portion of the Land Protection Focus Area would probably be developed for residential homes and associated recreational facilities.

2. Acquisition and Management by Others

Under this alternative, the Service would encourage other organizations and agencies, such as the New Jersey Department of Environmental Protection, the Cape May County Open Space Program and the Nature Conservancy, to protect and manage resources within the Land Protection Focus Areas, while providing technical and/or resource support as needed. Each of the above agencies or organizations are actively purchasing land in and around the Land Protection Focus Areas.

3. Less than Fee Acquisitions

Under this alternative, the Service would protect and manage land through conservation easement (purchase of partial interest). This method of protection allows lands to remain in private ownership, while allowing the Service control over the management of the land. An easement is any partial interest or right to a property, and can be purchased for a set period of time or in perpetuity. Once purchased, an easement is a legal restriction on the use of a property, and is binding even if the ownership changes. Conservation easements generally will decrease the value of the land and decrease tax revenue. The Service does not make Revenue Sharing payments on lands owned in partial interest.

In order to meet the refuge goal of providing long term protection to the biological resources, any conservation easement the Service acquires must preclude destruction or degradation of a habitat, and allow the refuge staff to adequately manage use of the area for the benefit of wildlife. Generally, this means purchasing the development right to the property in perpetuity. On the east coast, development rights often account for 80 to 95% of the land cost. The Service will use conservation easements where it is cost-effective or where owners of important habitats do not wish to sell in fee title.

4. Fee Acquisition

Under this alternative, the Service would protect the properties by acquiring all interest in the lands. This method of protection ensures the long term protection of resources, and allows the Service to fully manage the habitats to benefit Trust resources. This protection alternative will be used as the primary method for conserving wildlife habitat in the Land Protection Focus Areas.

F. Acquisition Alternatives

The Secretary of the Interior is authorized to acquire full or partial interests in land via direct purchase, donation, exchange, or transfer. A brief description of each method follows.

1. Purchase

This is the most direct means of obtaining fee title or an interest in land. The Service negotiates the sale of some or all rights to a property from a willing seller. Lands will be purchased with moneys from the Land and Water Conservation Fund, Migratory Bird Conservation Fund, or donations. In all acquisitions, the Service is required by Public Law 91-646, the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, to offer fair market value as determined by an approved appraisal that meets professional standards and Federal requirements. The Act further entitles landowners, tenants, and others to certain payments related to relocation if

they are displaced by a Federal land acquisition program. These entitlements include housing differential, moving expenses, and other incidental expenses associated with selling the property. These payments are in addition to the purchase price of the property and are not taxable under Federal tax laws. Public Law 91-646 describes the entitlement and prerequisites required to establish eligibility. Relocation advisory services will be provided to all persons displaced from their lands by acquisition for refuge purposes.

2. Donation

A citizen or private organization may wish to make a gift of land or interests in land to the Service for conservation purposes. Aside from the cost factor, these acquisitions are no different than purchase of land. Donated lands would be appraised for tax purposes.

3. Exchange

The Service may exchange lands under Service ownership for land having greater habitat or wildlife value. Inherent in the exchange concept is the requirement to get dollar value for dollar value. Exchanges are attractive in that they usually do not increase Federal land holdings or require funds for purchase, but they may be very labor intensive and take a long time to complete.

4. Transfer

Lands may be transferred to the Service from another Federal agency. The U. S. Coast Guard has transferred excess lands to the Service for the Cape May National Wildlife Refuge.

5. Condemnation

As a Federal agency, the Service does have the power of eminent domain. However, the Service has a strict policy of acquiring land from only willing sellers and has not been involved in an adversarial condemnation in over ten years. In certain circumstances where the Service and the willing seller cannot reach an agreement on the value of the property, or where the rightful owner of a property cannot be determined, the condemnation process may be used to determine fair market value or to clear title. In these "friendly condemnations," the Service will only initiate the condemnation process at the request of a willing seller (or a town, in the latter case).

G. Coordination

The Land Protection Focus Areas were developed through the Comprehensive Conservation Plan, in coordination with Federal and State agencies, Federal, State, County and local elected officials, private organizations, and private citizens. The Comprehensive Conservation Planning process started in August 1996. We held eleven public meetings on the Comprehensive Conservation Plan during the fall of 1996, and an alternatives workshop in April 1997. We released a Draft Comprehensive Conservation Plan and Environmental Assessment for 45 days of review and comment in the Spring of 1999 and released a Revised Draft Comprehensive Conservation Plan and Environmental Assessment for 30 days of review and comment in Summer of 2000. We signed a Finding of No Significant Impact (FONSI) in September 2002.

We released a draft LPP for 30 days of review and comment in November 2001. During the comment period, sixteen landowners within the proposed expansion area contacted the refuge office. Eleven of those contacts expressed an interest in selling their property to the Service. Two individuals indicated they were not interested in selling their property. The other individuals contacting the refuge office requested additional information regarding the LPP and where their property was located in relationship to the proposed expansion areas.

The Refuge Manager met with Dennis Township and Middle Township administrators to discuss the LPP. The Middle Township Administrator expressed interest in selling property under their ownership to the Service.

All comments received were supportive of the LPP. There was no indication from the public that we needed to change the proposed expansion areas.

H. Socioeconomic and Cultural Aspects

This alternative will result in the Service acquiring up to 3,591 acres within the Land Protection Focus Areas.

Because of development pressure in Cape May County, public meeting participants emphasized the need for continued land acquisition and protection. The Land Protection Focus Areas protect the watershed areas upstream from lands already owned, several additional sites with rare species, and corridors connecting refuge lands with nearby conservation areas.

Lands acquired under this alternative will provide better protection for entire watersheds and their processes, ensure water quality and quantity for wetlands, and provide more contiguous habitat for migrating birds and genetic exchange between populations of non-migrating species. Additional land acquisition will enable improved management and water quality protection for waters feeding into the refuge and the Delaware Bay ecosystem.

Increased land protection through planning and acquisition will result in a variety of economic benefits to townships, boroughs, and counties. Service land acquisition will reduce sprawl and encourage smart growth by conserving developable lands. Towns may realize benefits as direct and indirect expenses related to development are reduced. Acquisition of potentially developable lands will increase the value of remaining developable lands by increasing demand and preserving local ecosystem and aesthetic values. Sustaining the output of ecosystem goods and services is the key to sustainable wildlife resources, sustainable economic activities, and a healthy human population.

Refuge Revenue Sharing payments to municipalities within which the Service acquires property will increase as the Service acquires the 3,591 acres of land within the Land Protection Focus Areas. If the Service were to acquire all this land (assuming an average appraised value of $3,000 per acre), the full payment value of Refuge Revenue Sharing payments to the municipalities would increase by $80,796 per year (3,591 acres x $3,000/acre = $10,773,000 x .0075 (3/4% of appraised value) = $80,796). It should also be noted that refuge lands require very few local services.

This alternative will:

- Increase tourism revenues to local businesses from expanded visitor use;
- Increase Service expenditures for equipment and supplies; and
- Increase Service expenditures for expanding refuge staffing.

I. Acquisition Priorities

We delineated the Land Protection Focus Areas based on the following criteria:

- Known sites of threatened or endangered species and communities;
- Areas important to the ecological health of lands already owned (to ensure intact ecosystem processes, protect the quality and quantity of water for wetlands, provide habitat corridors between existing conservation lands, or protect sufficient contiguous acreage to support viable wildlife populations);
- Areas important for priority wildlife species (e.g., critical stopover habitat for migrating birds);
- Areas identified as priority sites for protection by other conservation organizations;
- Areas still viable for conservation protection (i.e., not already developed).

Most of the properties within the 3,591 acre refuge expansion area are privately owned, but there are some publicly owned properties (county, state and federal) as well, for example, there are 530 acres managed by the U.S. Coast Guard. Within the refuge expansion area, we identified three levels of acquisition priorities based on

the above criteria. These priorities do not reflect a landowner's preference to sell the land. Since Service policy is to acquires land only from willing sellers, the order of actual land acquisition may not follow that of the priorities identified below. Tables at the end of this plan list parcels within the refuge expansion area by township tax lot identification number so that landowners can better comprehend the Service's acquisition priorities and how the refuge expansion may impact their lands.

Priority 1: There are 2,599 acres of priority 1 properties within the refuge expansion area. We will focus our protection efforts on purchasing these properties first. These lands have very high biological and trust resource value. These lands are crucial in providing connectivity among habitats and natural communities. These lands consolidate and protect the integrity of our trust resources. These lands best safeguard watershed values.

Priority 2: There are 426 acres of priority 2 properties within the refuge expansion area. These lands have high biological and trust resource value. These lands are an important link in overall biological resource protection. These lands help protect priority 1 refuge lands; or protect existing refuge lands. These lands contribute to watershed protection.

Priority 3: There are 528 acres of priority 3 properties within the refuge expansion area. These lands have somewhat lower biological and trust resource value. These lands would help consolidate ownership for more effective management, or to protect existing refuge lands. These lands contribute to watershed protection.

Parcel Maps and Table

The maps in this appendix show the land we own now, the new acquisition boundaries, and the parcels we plan to acquire. Following the maps is a table identifying each parcel, its tax map number, its acreage, whether it is publicly or privately owned, and our priority and recommended option for acquiring it.

We have grouped the parcels onto Group A, B, and C maps solely to enlarge their display. ***Those groupings do not connote priority rankings.*** We plan to acquire either full or partial interest in all the parcels by fee purchase from willing sellers.

Following the maps for each grouping are a set of tax maps from the townships within the expansion areas.

Expanded definitions of each table column head follow:

Priority: ranked on a scale of one to three, with one being our highest priority acquisitions.

Block and Lot: taxing authority block and lot numbers.

Acres: estimated acreage from town tax maps. Portions of some parcels are included within the current, approved acquisition boundary for Cape May NWR. For these parcels, we calculated only the expansion acreage.

Protection type: we have identified here what we believe, given the information now available, is the minimal level of Service interest needed for project objectives that is also cost-effective. However, as parcels become available in the future, changes may be warranted to ensure we are using the option that best fits the situation at that time (see section E, Protection Alternatives).

Acquisition type: purchase, donation, transfer, or exchange (see section F, Acquisition Alternatives).

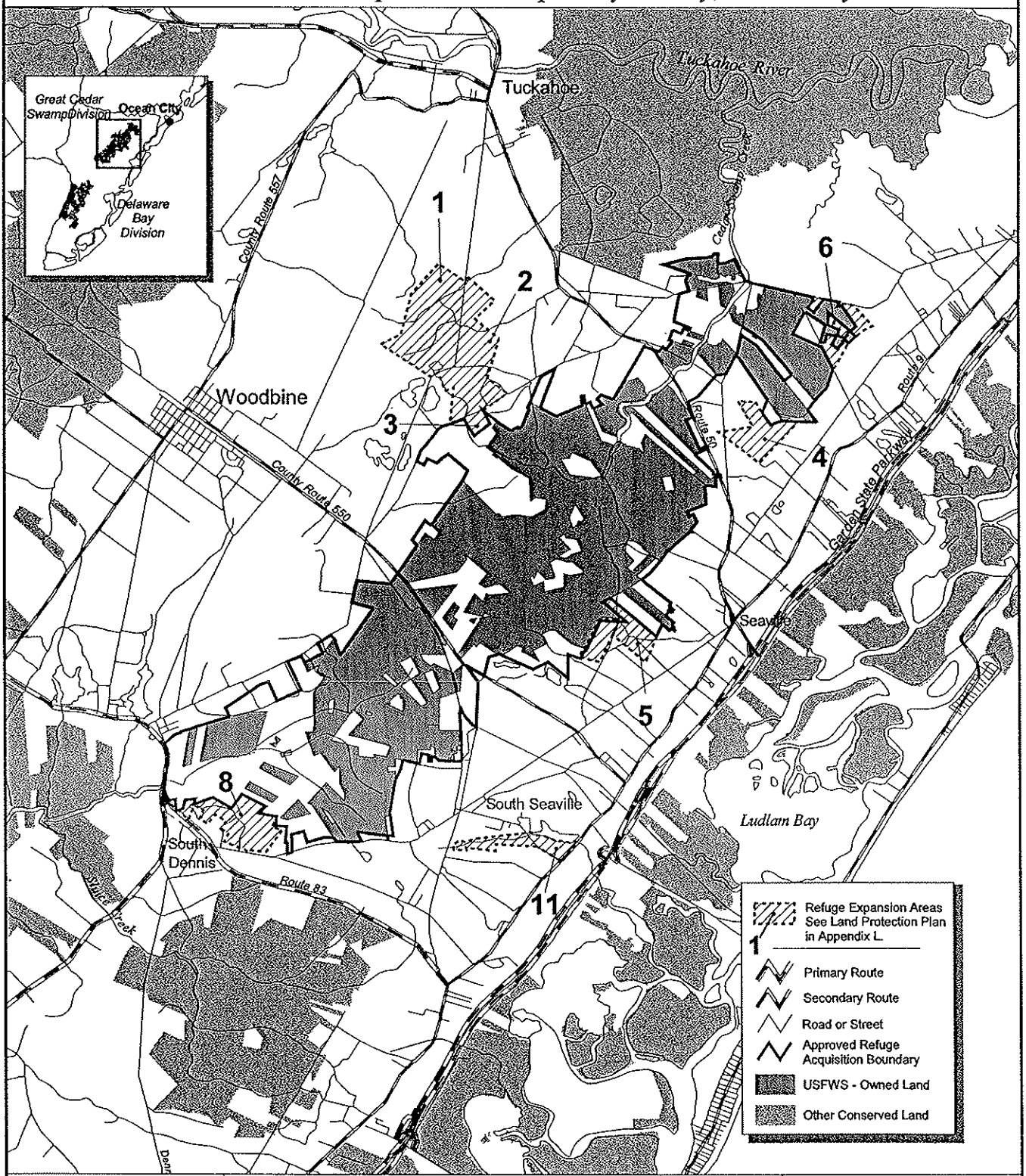
Ownership: public or private. Public ownership describes parcels owned by municipalities, state agencies, or federal agencies.

MAP A

Refuge Expansion Areas

Cape May National Wildlife Refuge, Group A

Great Cedar Swamp Division, Cape May County, New Jersey



Data Sources:
USGS - 1:100,000 roads & hydro.
New Jersey - other protected land.
USFWS - refuge boundaries & other refuge information.

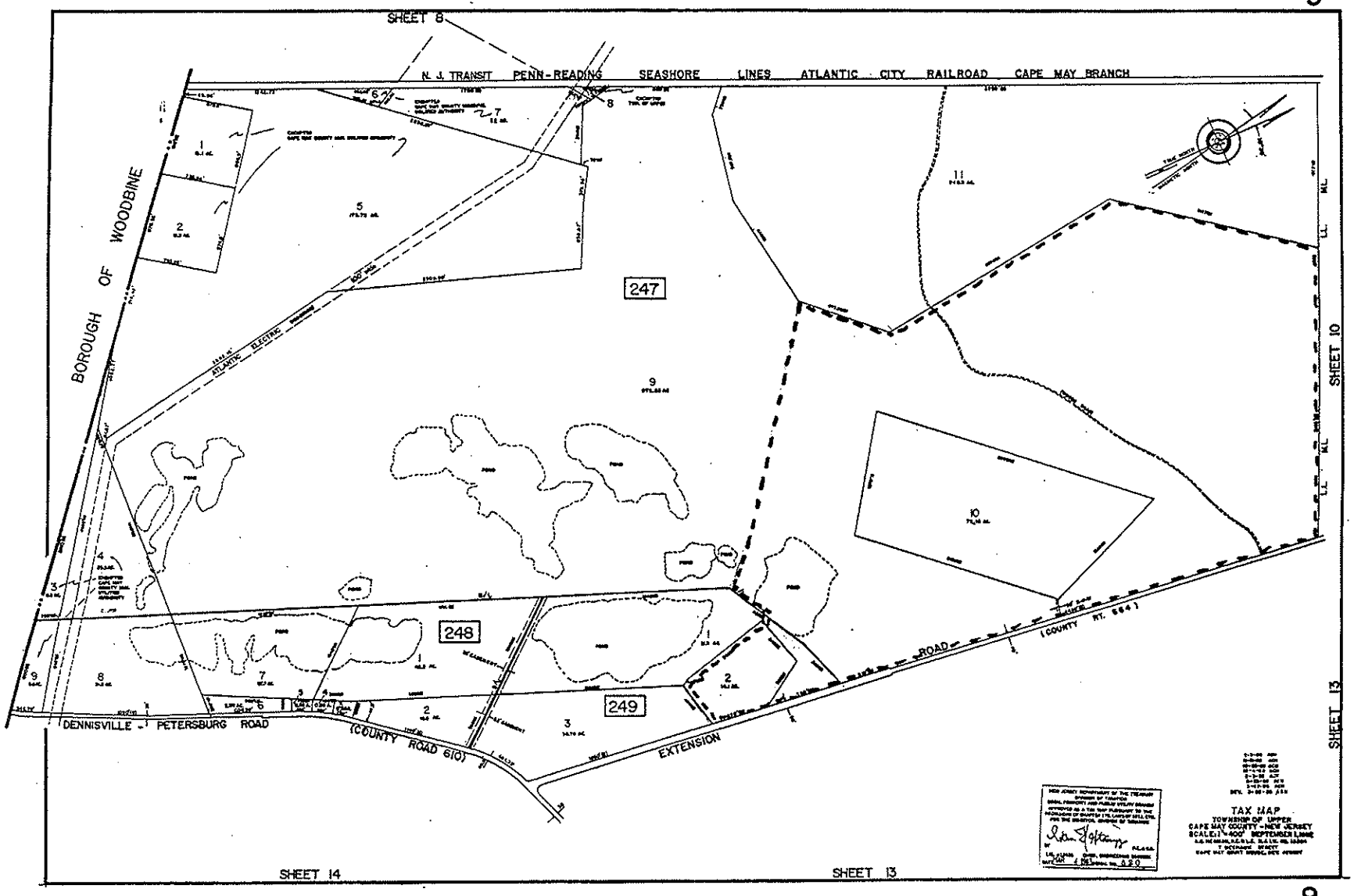
Map prepared for Jersey Coast Refuges Comprehensive Conservation Plan, August 2002.
This map is for planning purposes only.

0 1 2 3 4 Miles

0 1 2 3 4 5 Kilometers

N

UPPER TWP.



Group A Map 1

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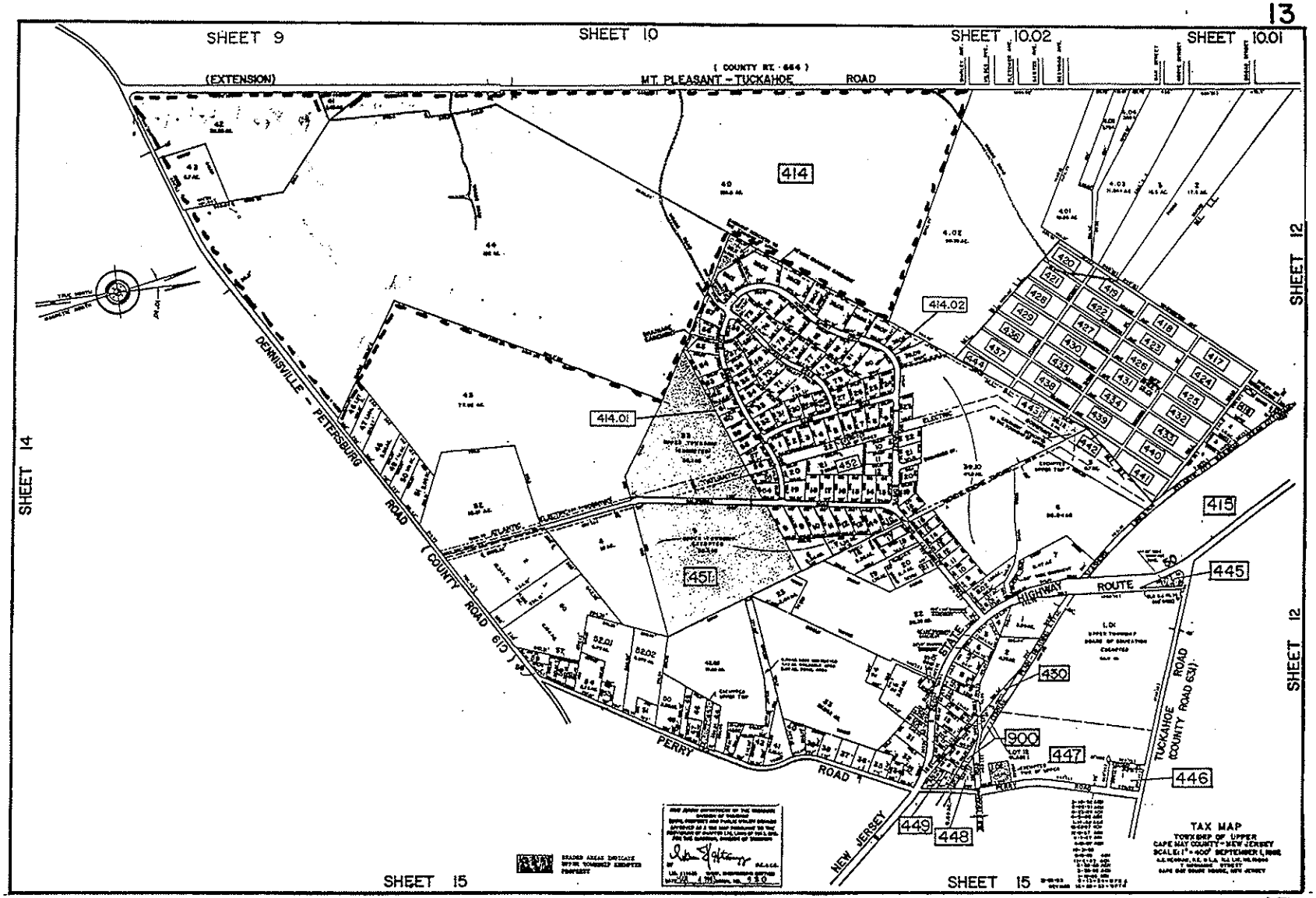

Group A Map 2

Group A Map 2

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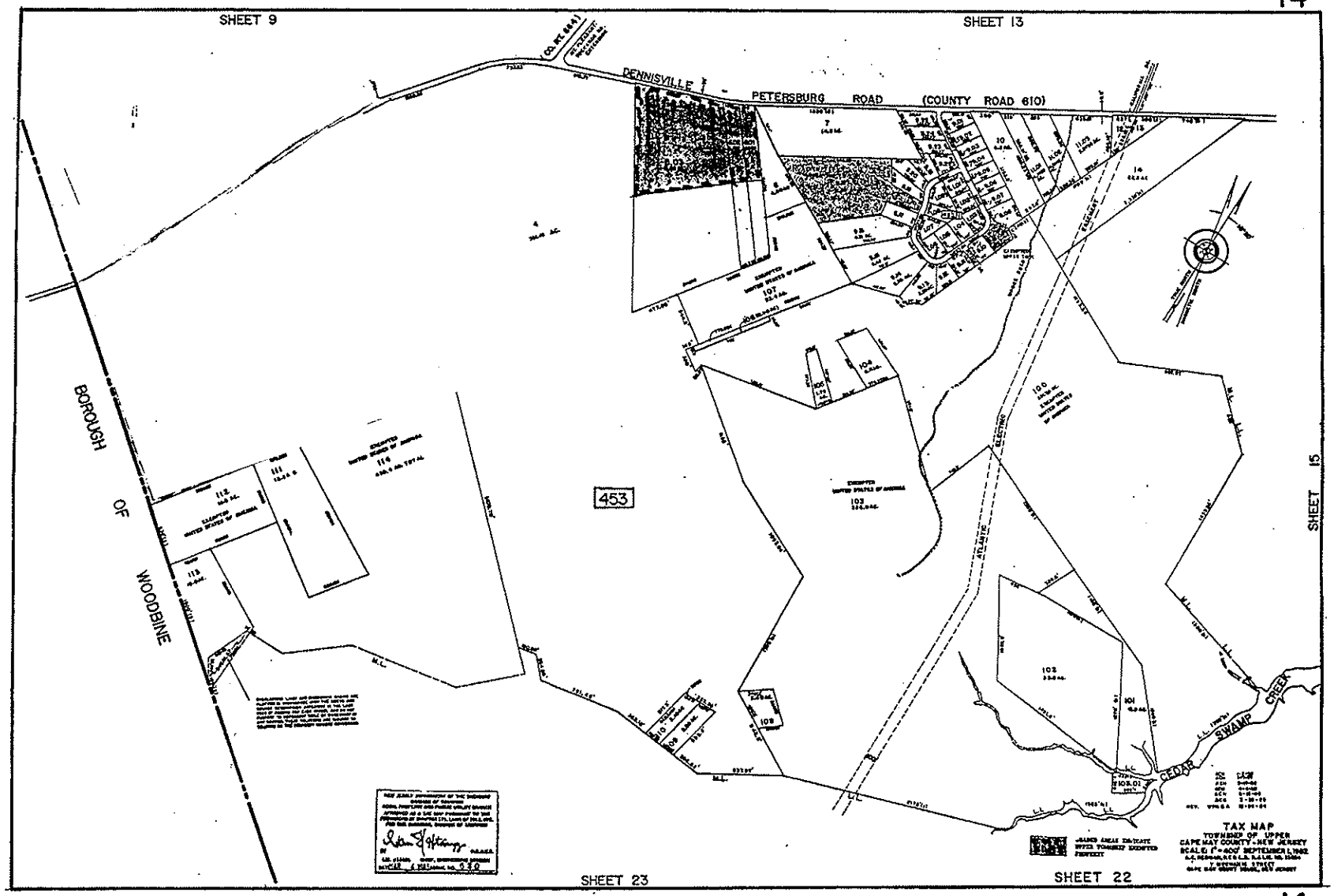

Group A Map 3

Group A Map 3

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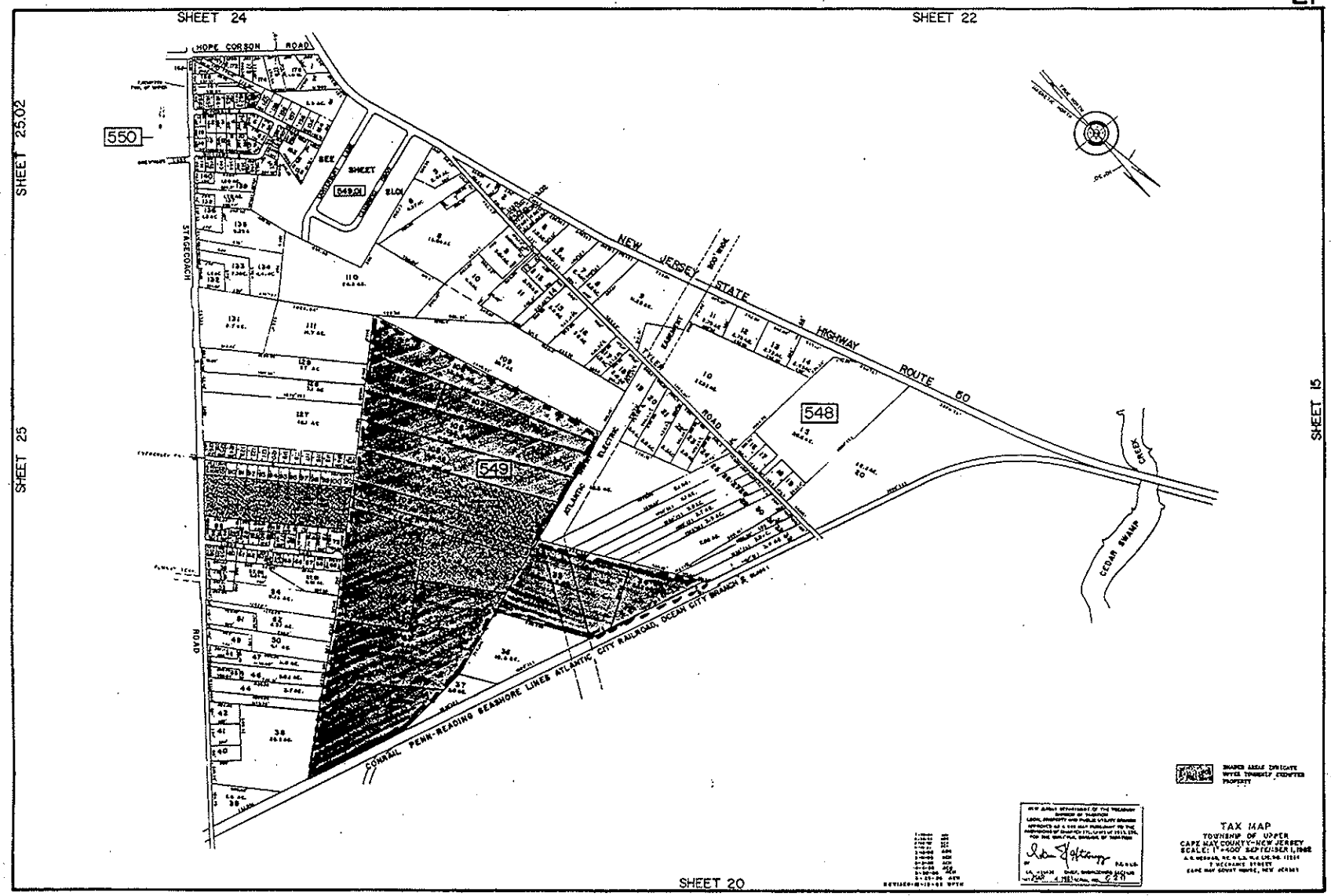

Group A Map 4

Group A Map 4

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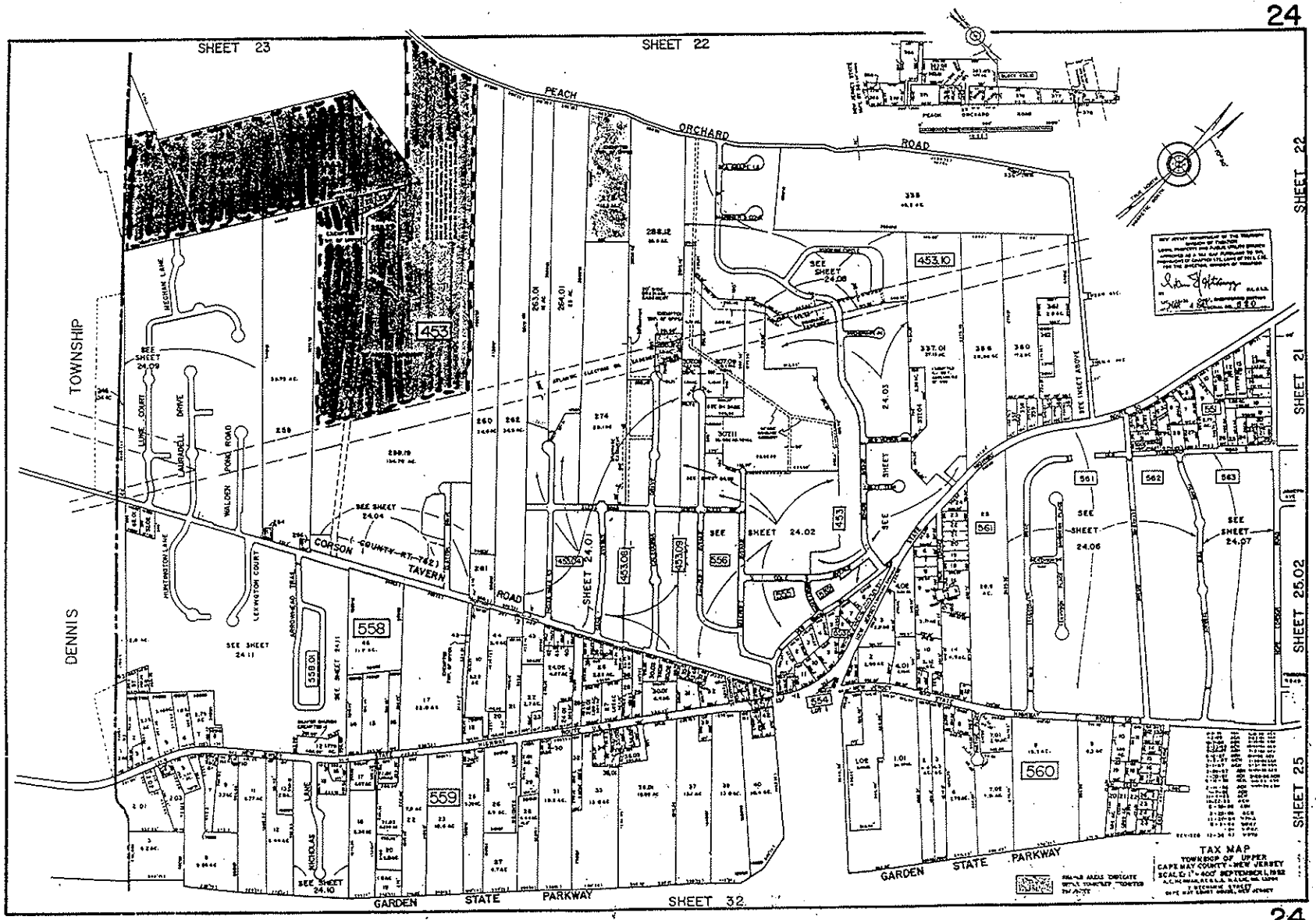
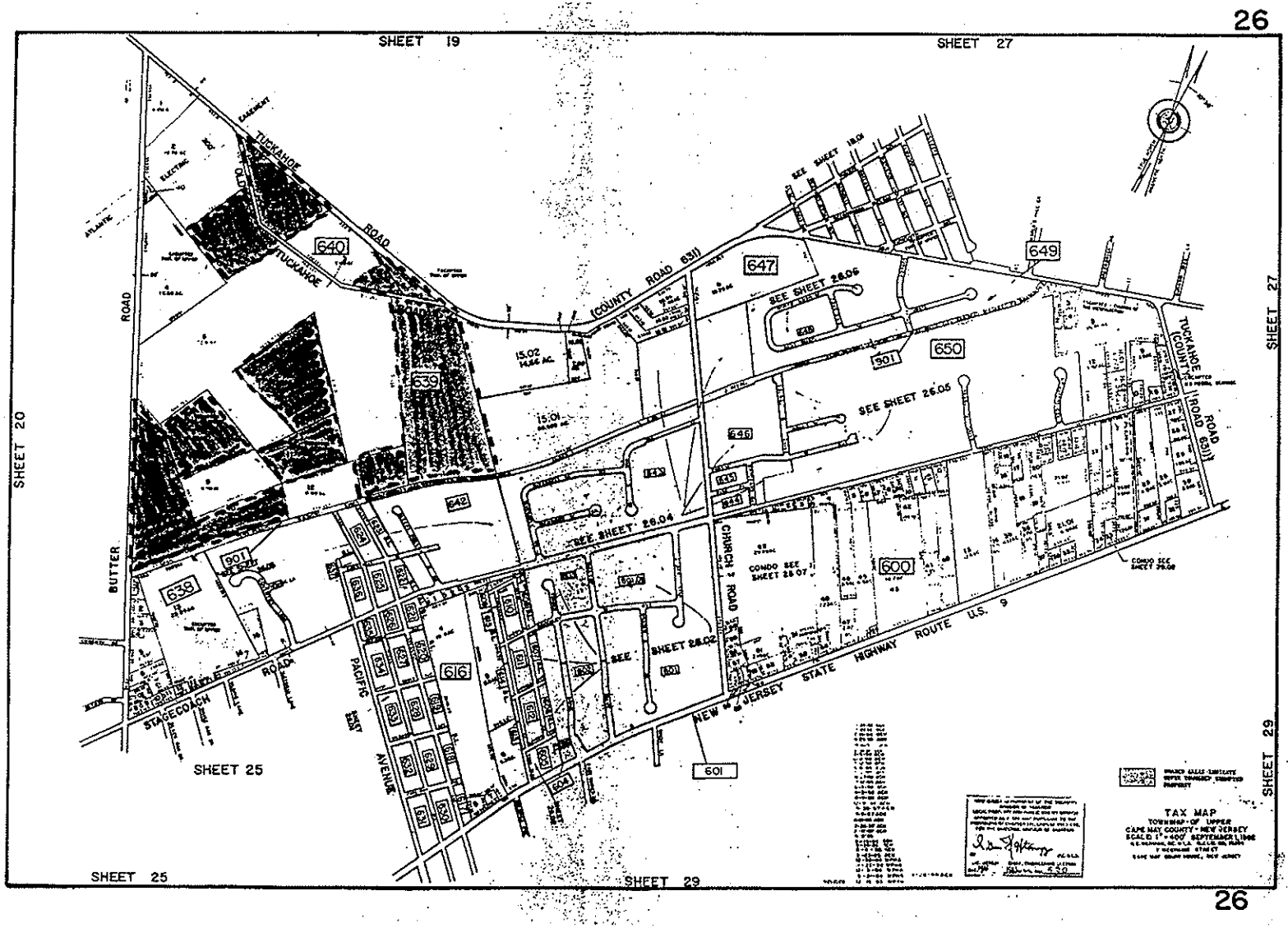


Group A Map 5

Group A Map 5

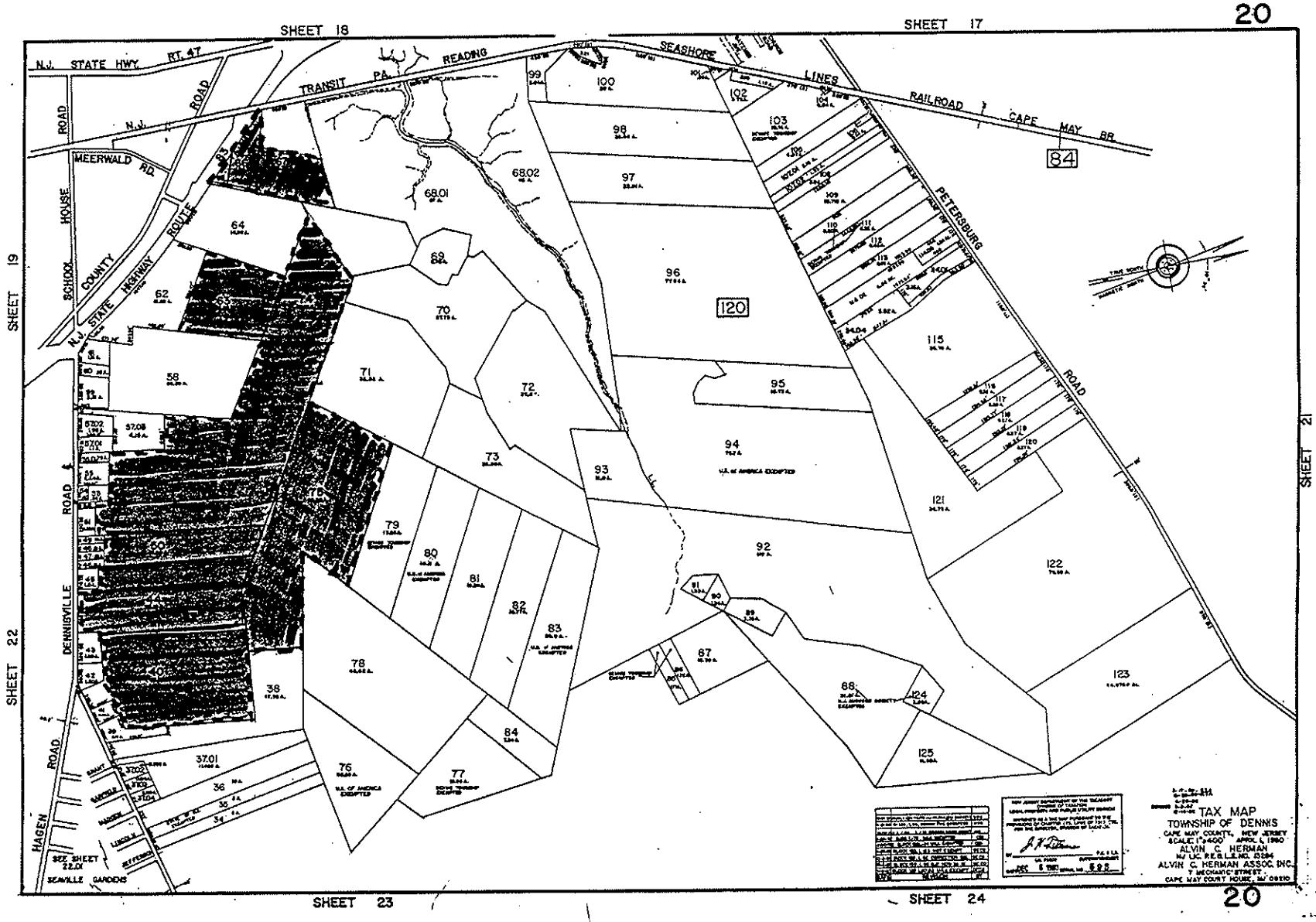
UPPER TWP



Group A Map 6

Group A Map 6

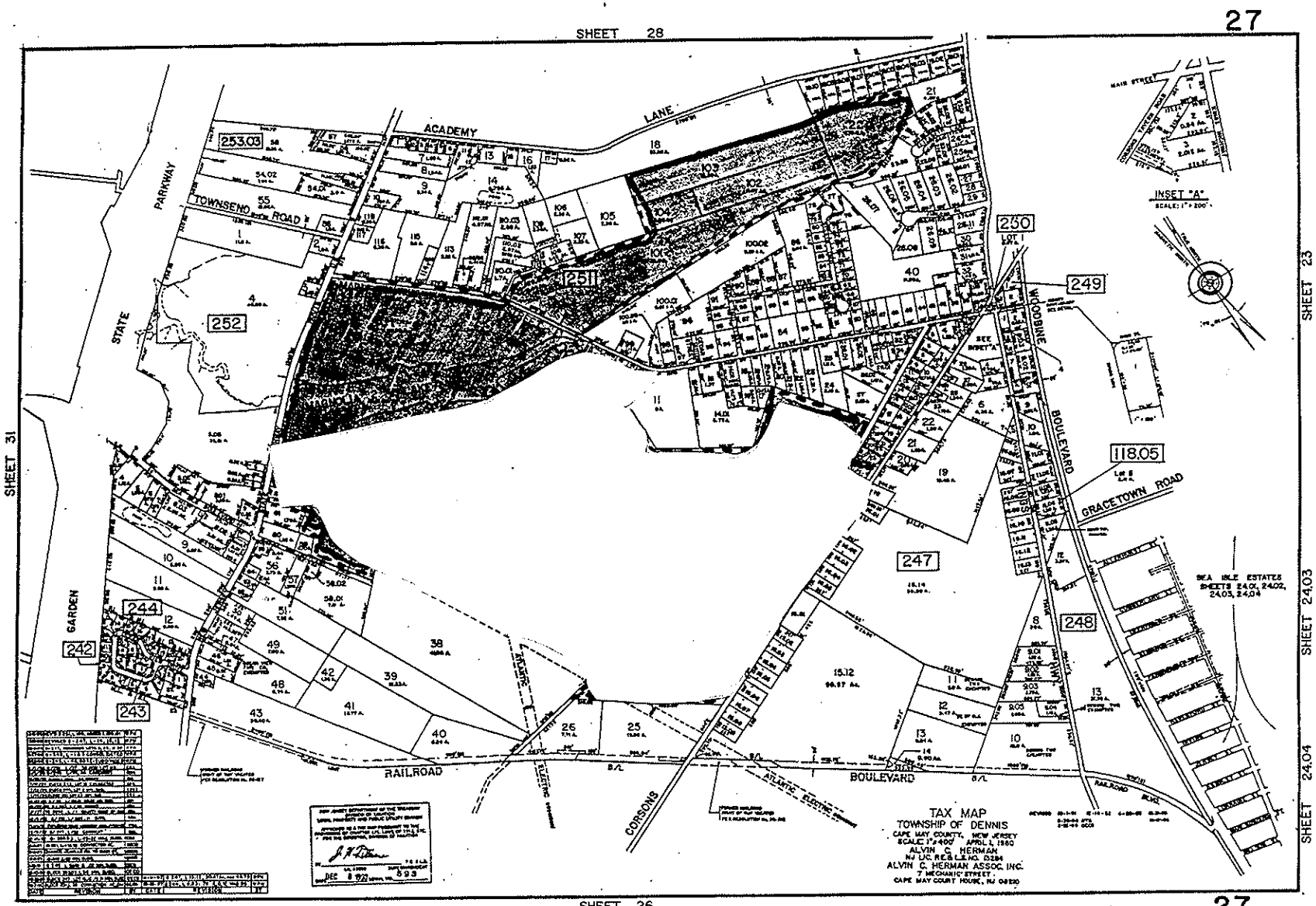
DENNIS TWP



Group A Map 8

Group A Map 8

DENNIS TWP



Group A Map 11

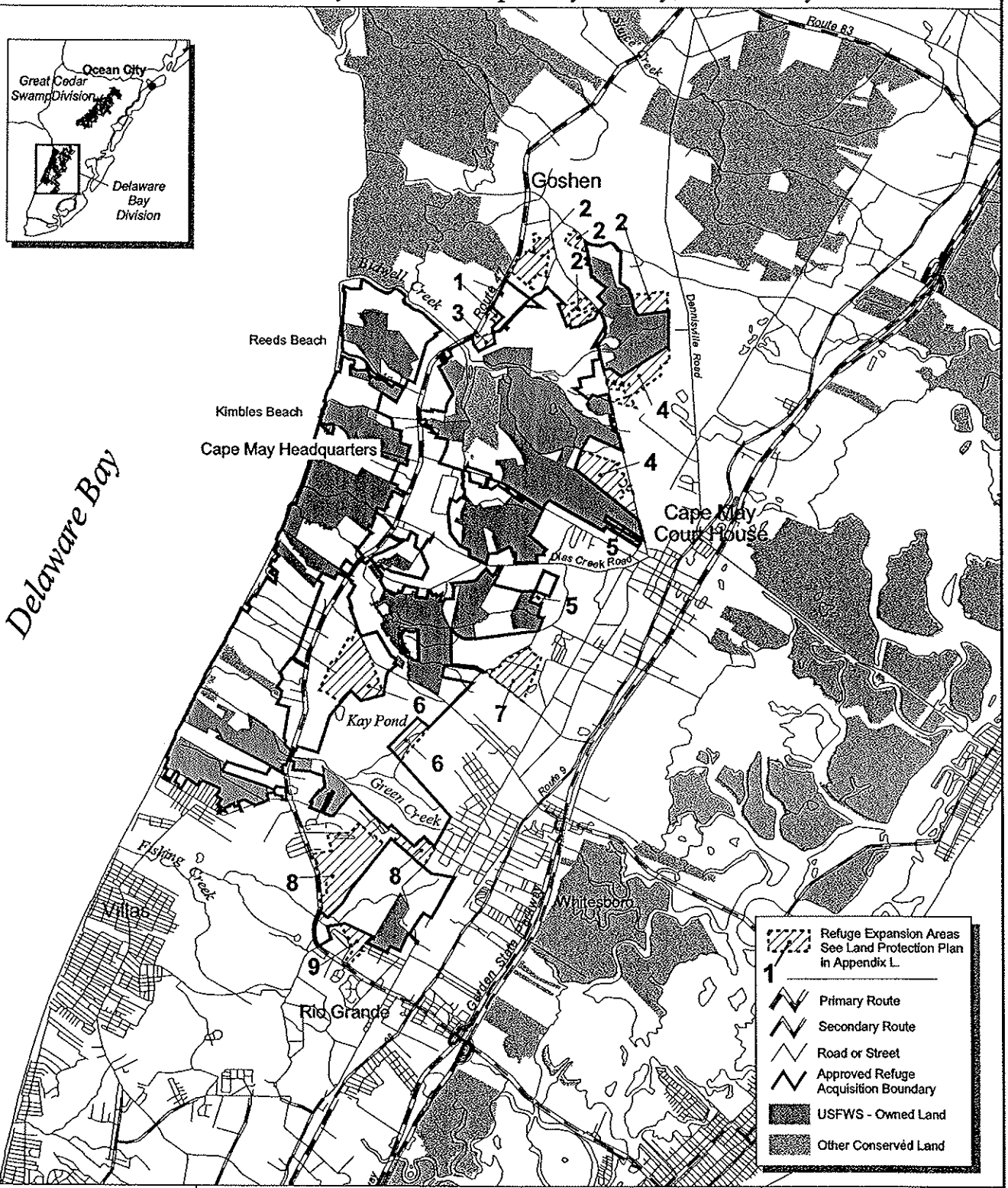
Group A Map 11

Refuge Expansion Areas

MAP B

Cape May National Wildlife Refuge, Group B

Delaware Bay Division, Cape May County, New Jersey



Data Sources:
USGS - 1:100,000 roads & hydro.
New Jersey - other protected land.
USFWS - refuge boundaries & other refuge information.

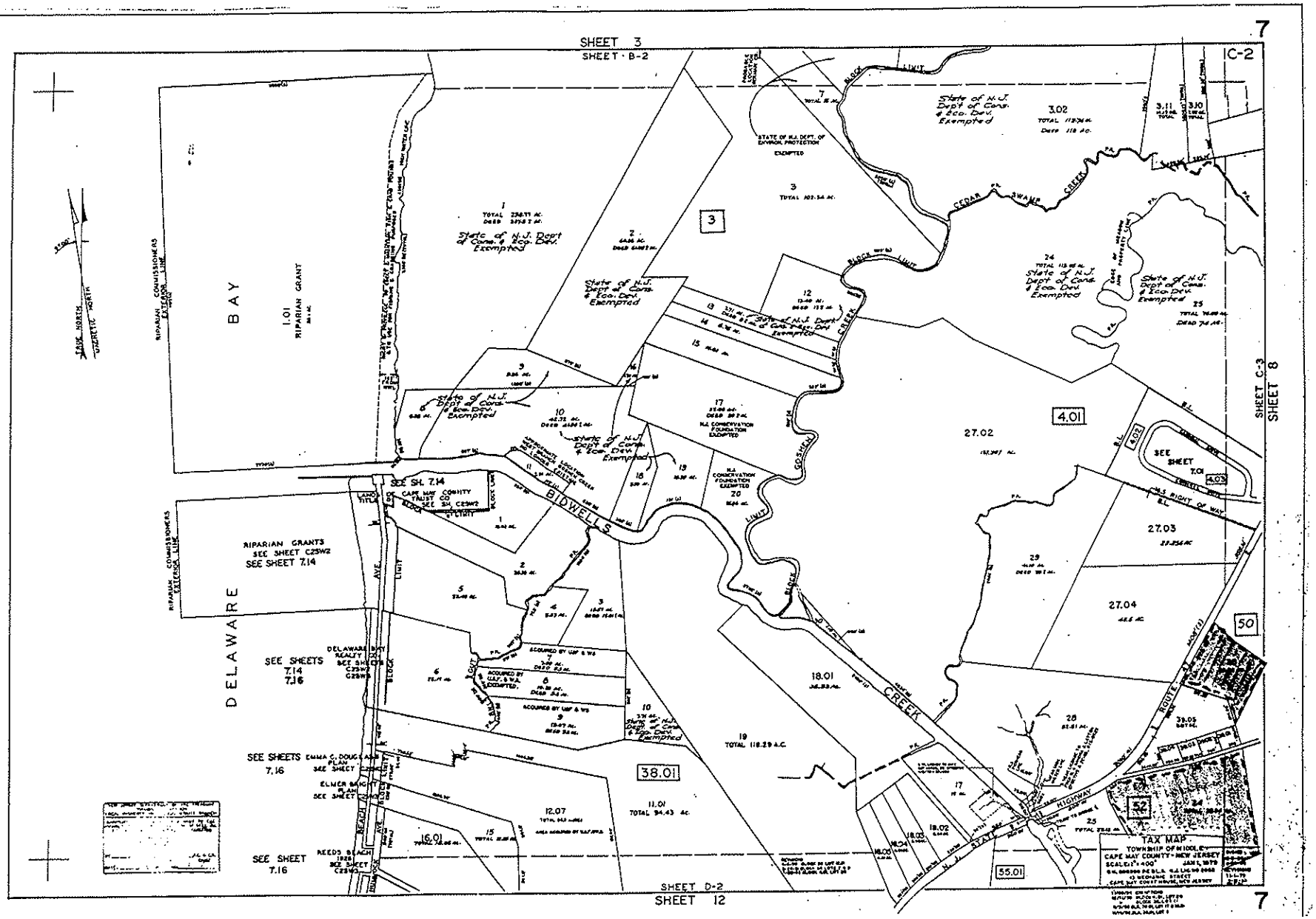
Map prepared for Jersey Coast Refuges Comprehensive Conservation Plan, August 2002.
This map is for planning purposes only.

0 1 2 3 4 Miles

0 1 2 3 4 5 Kilometers

N

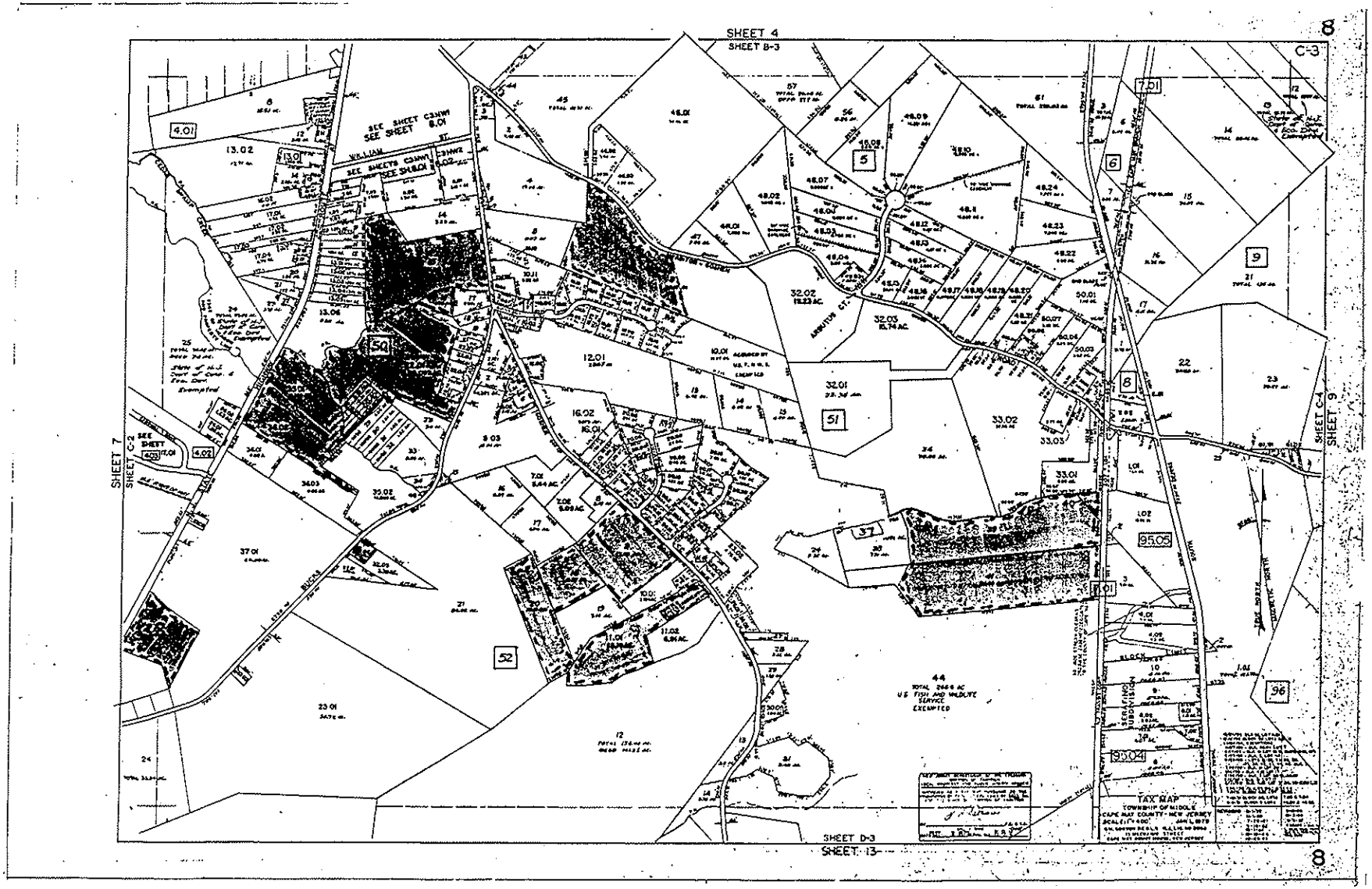
MIDDLE TWP



Group B Map 1

Group B Map 1

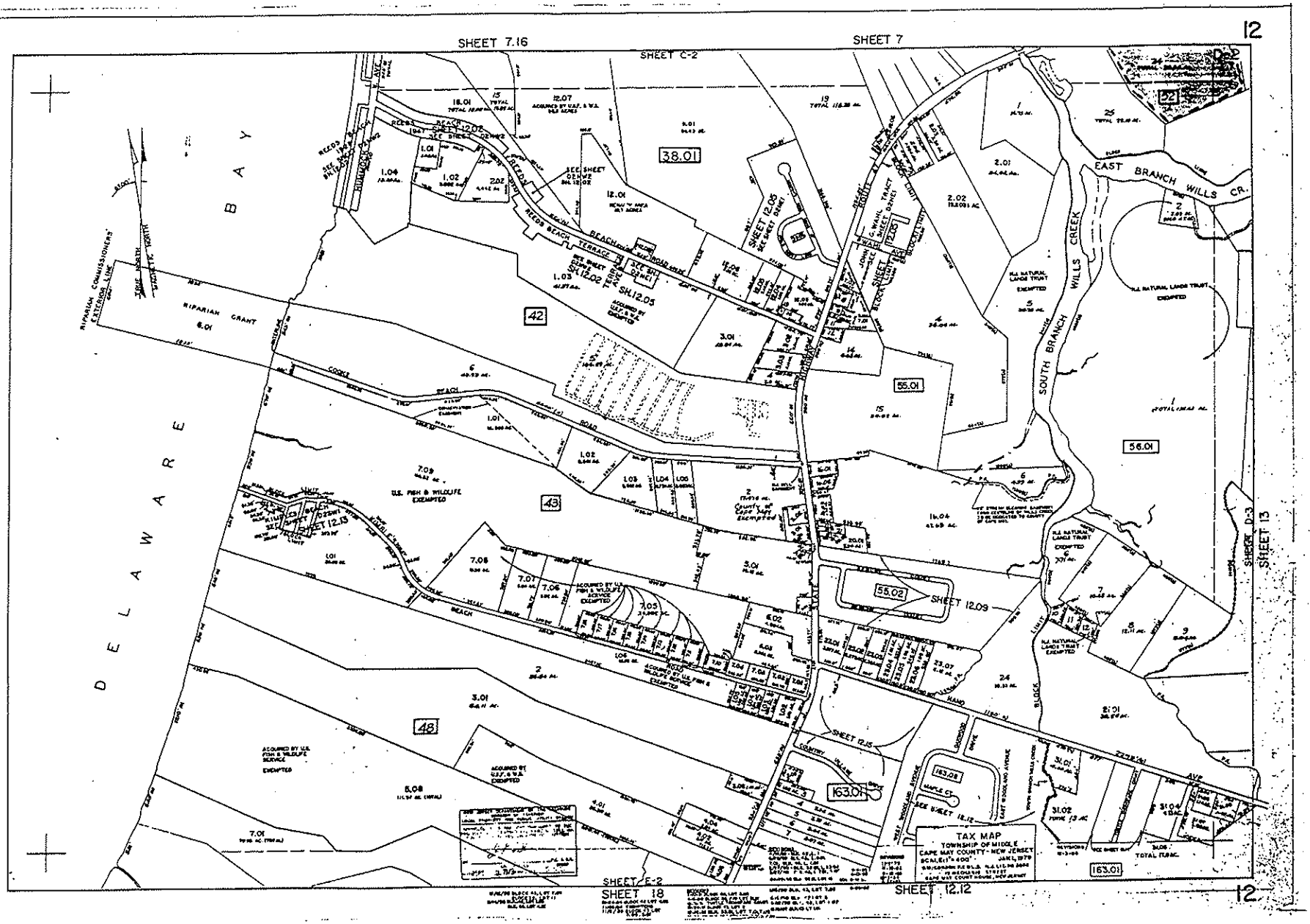
MIDDLE TWP



Group B Map 2

Group B Map 2

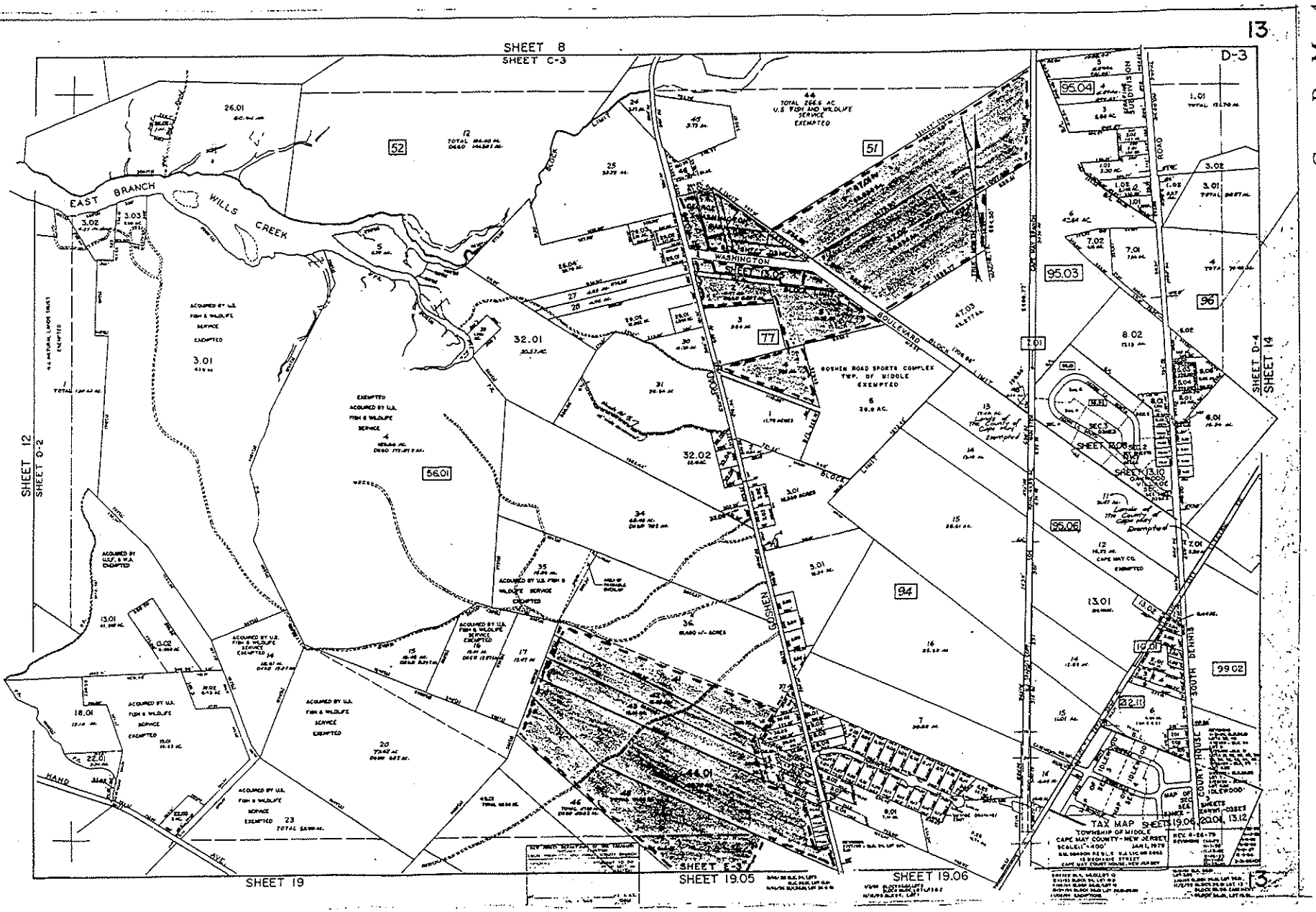
MIDDLE TWP



Group B Map 3

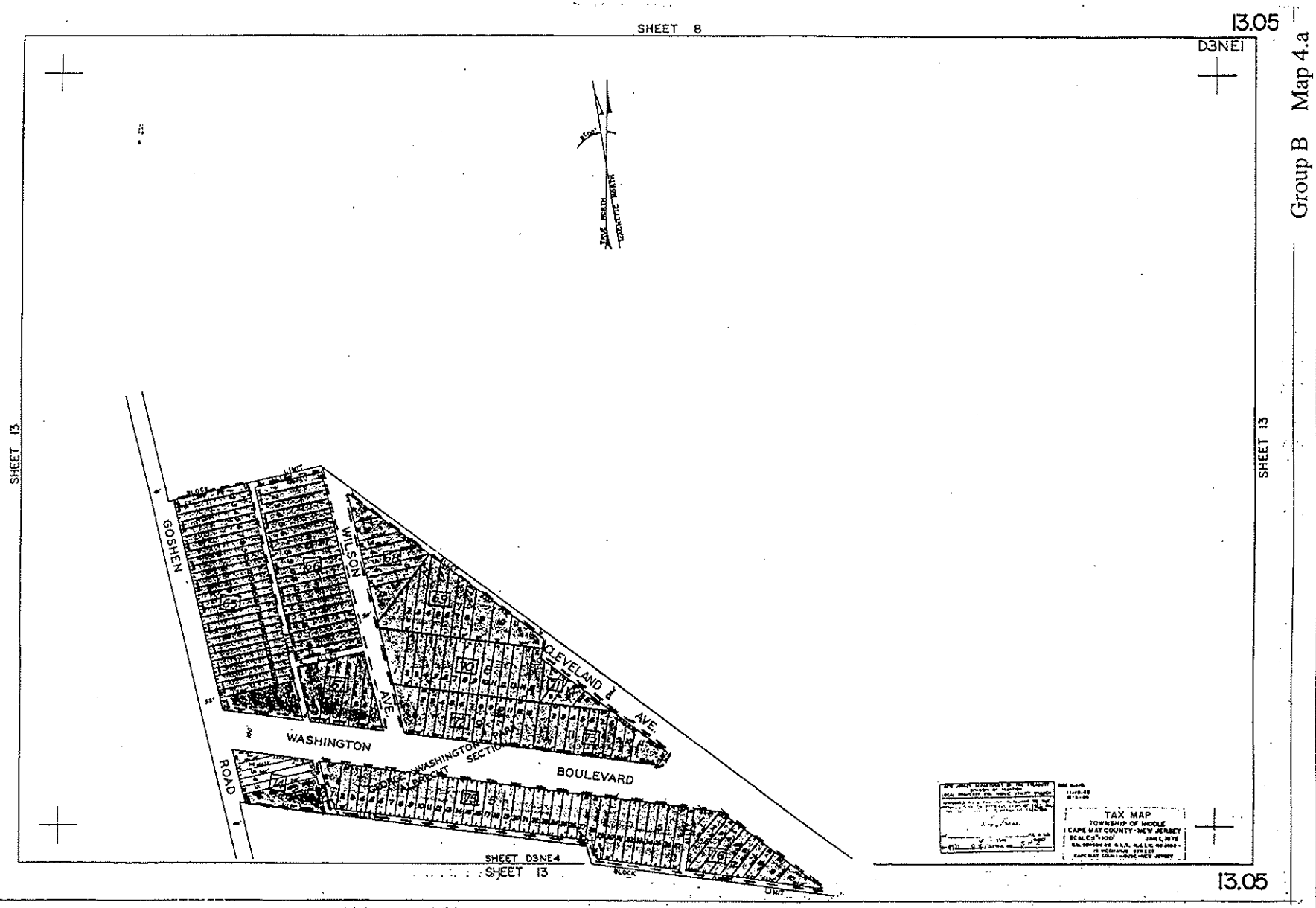
Group B Map 3

MIDDLE TWP



Group B Map 4

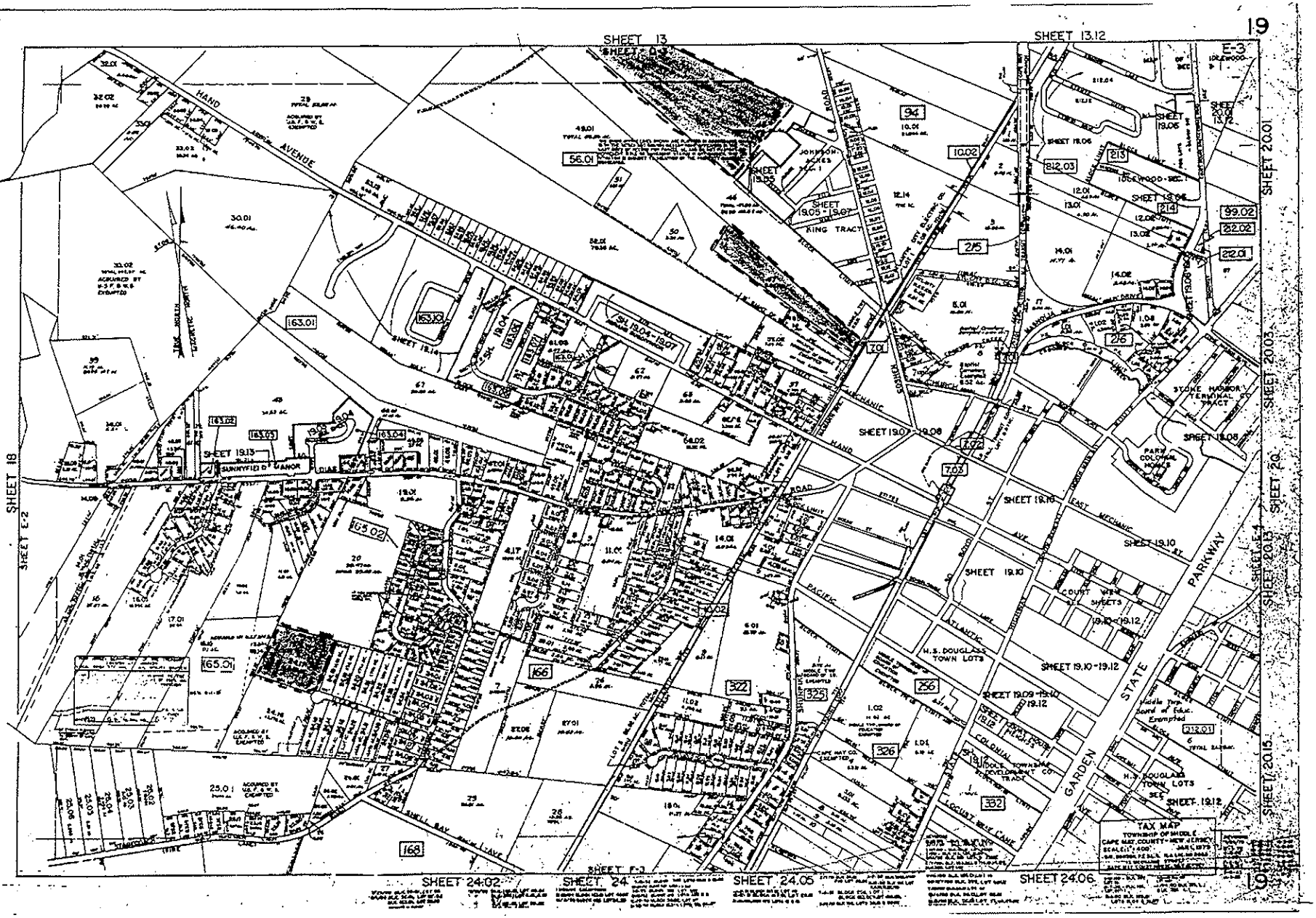
MIDDLE TWP



Group B Map 4.a

Group B Map 4.a

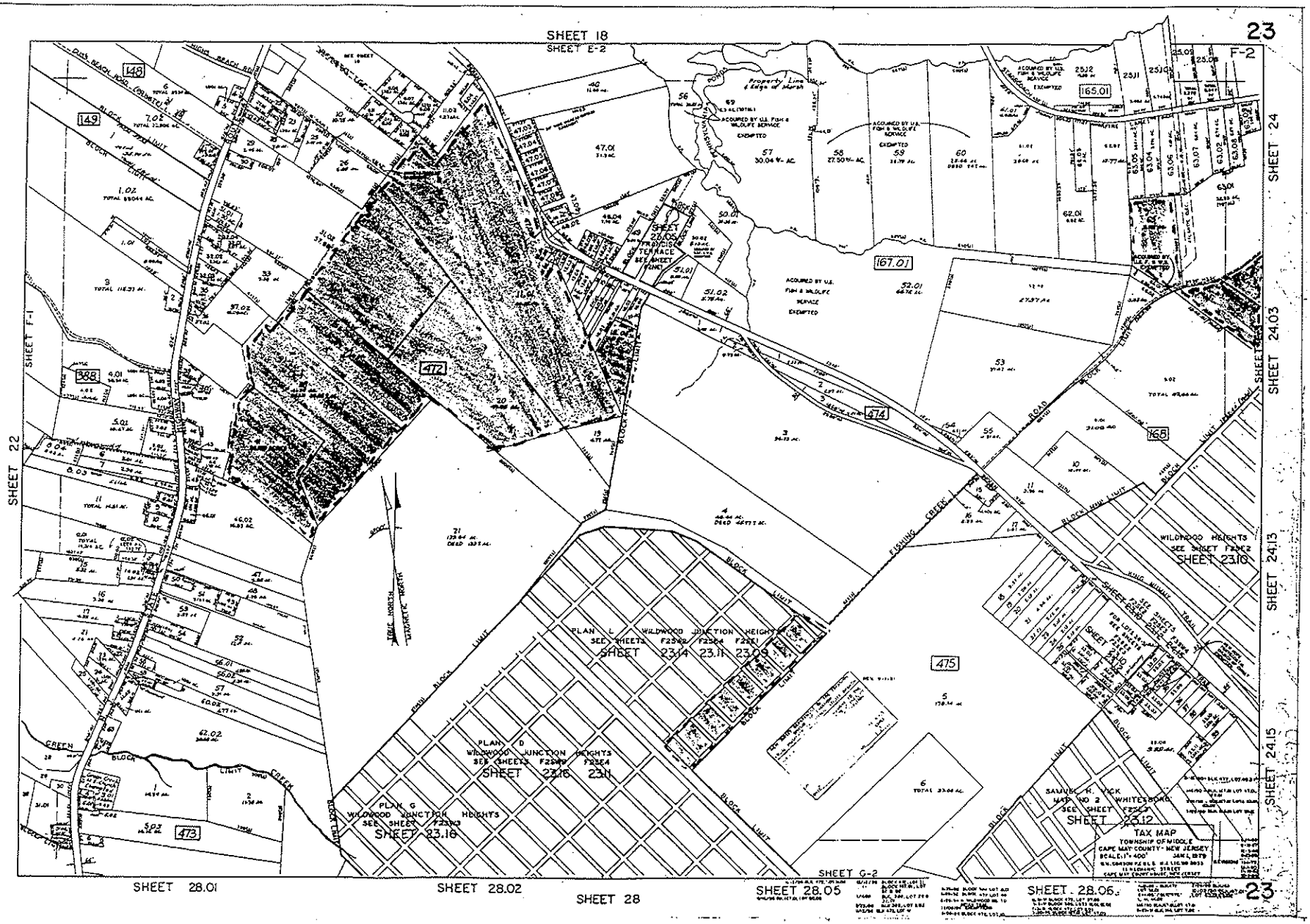
MIDDLE TWP



Group B Map 5

Group B Map 5

MIDDLE TWP



Group B Map 6

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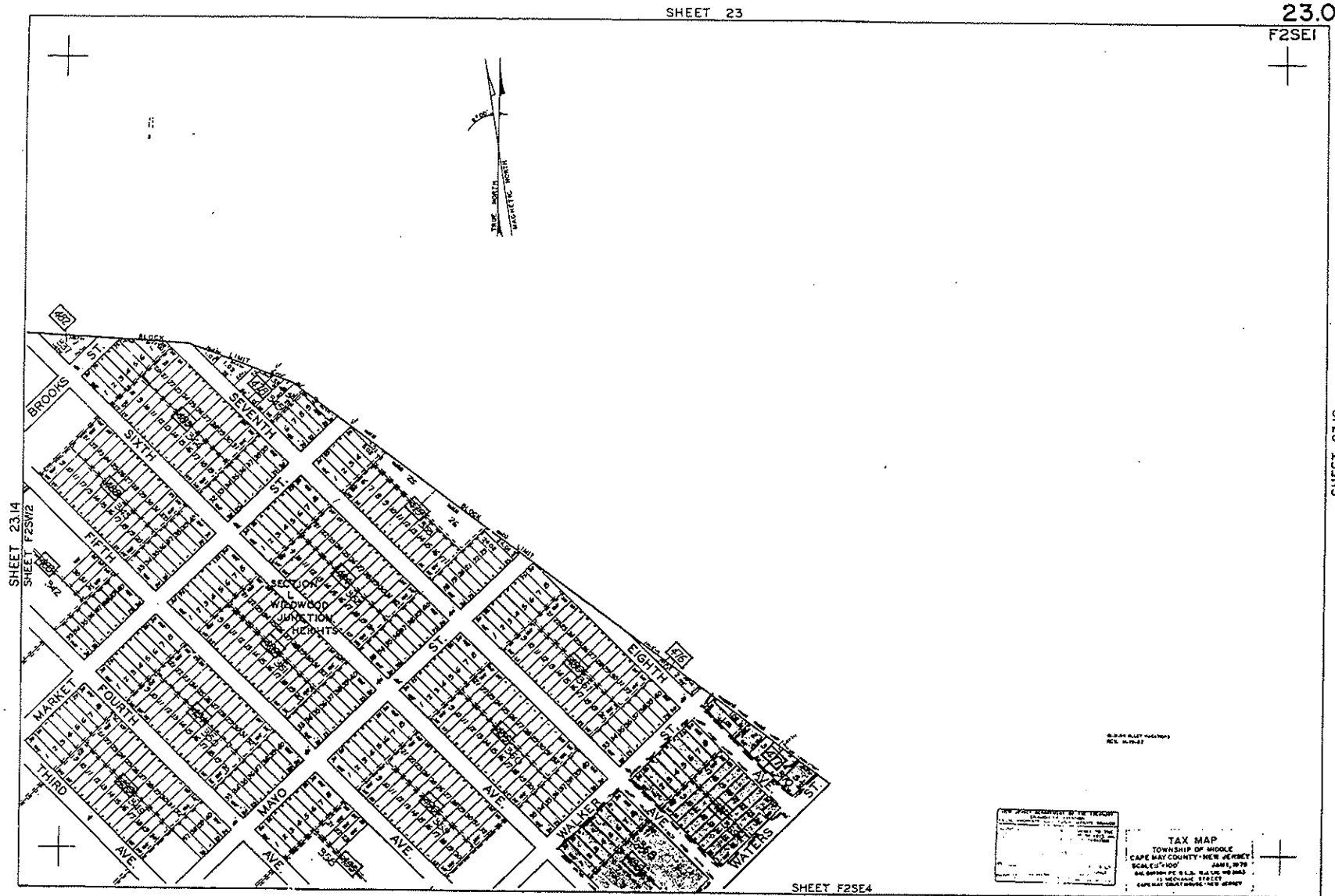

Group B Map 6.a

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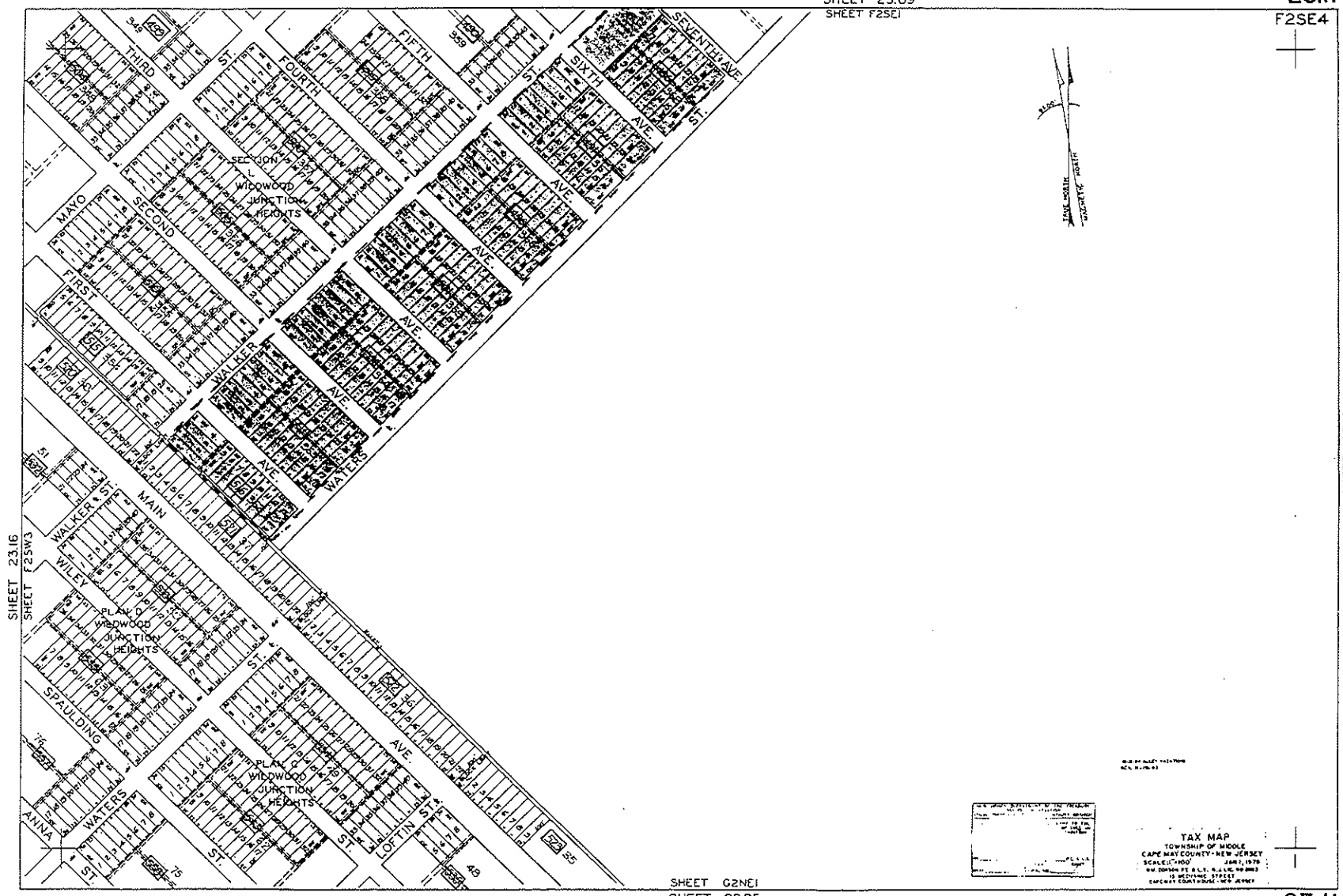

Group B Map 6.b

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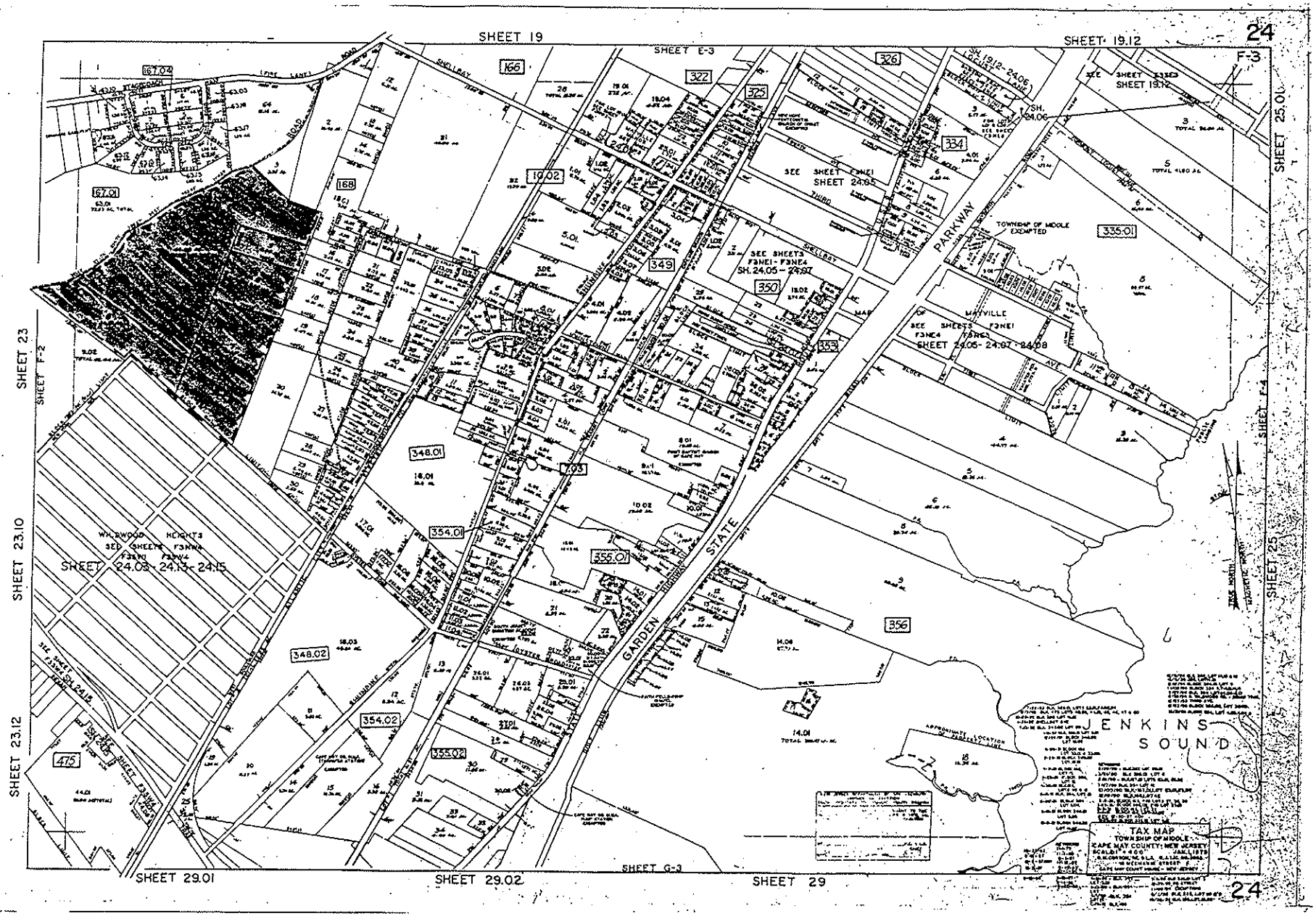
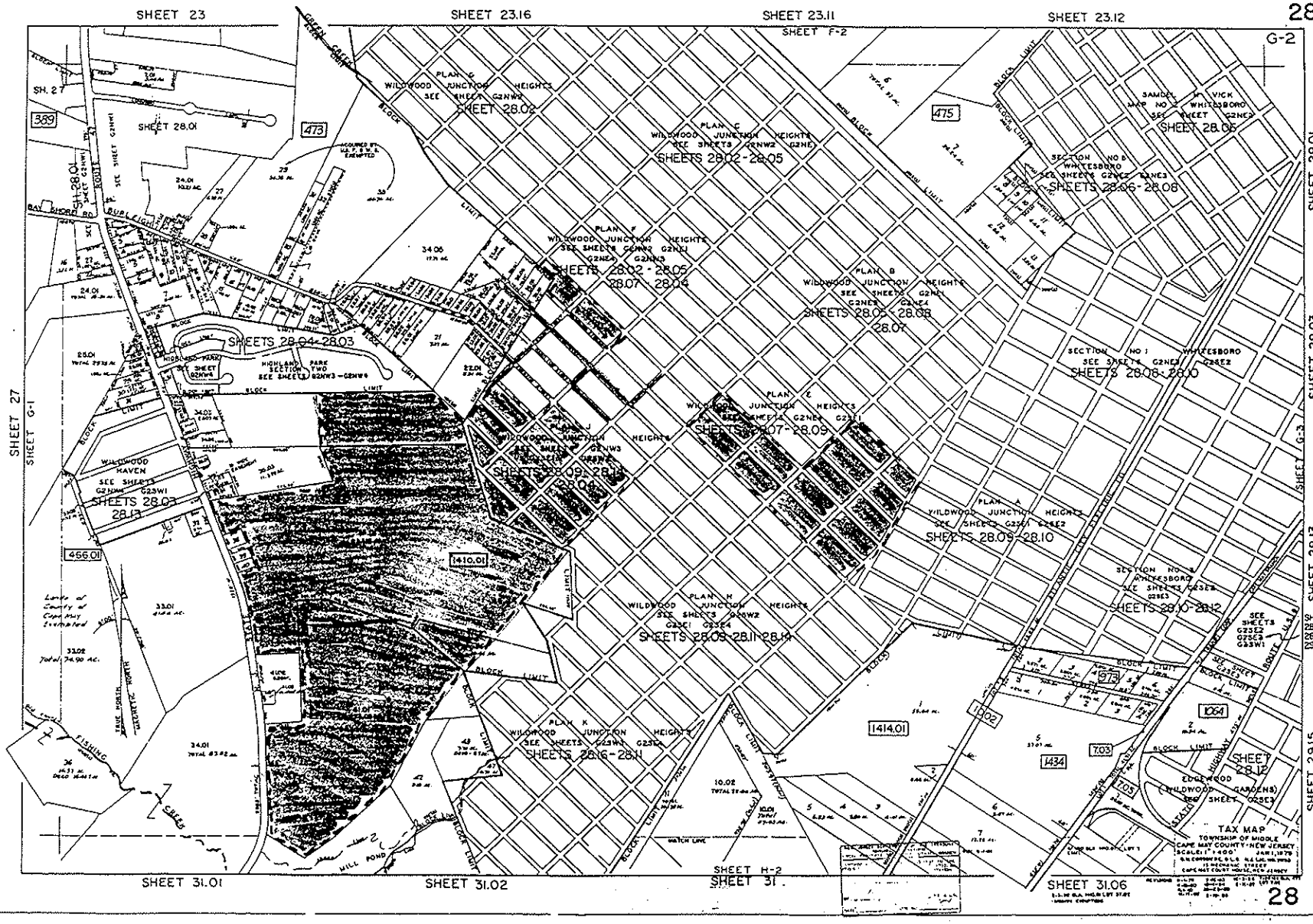


Group B Map 7

Group B Map 7

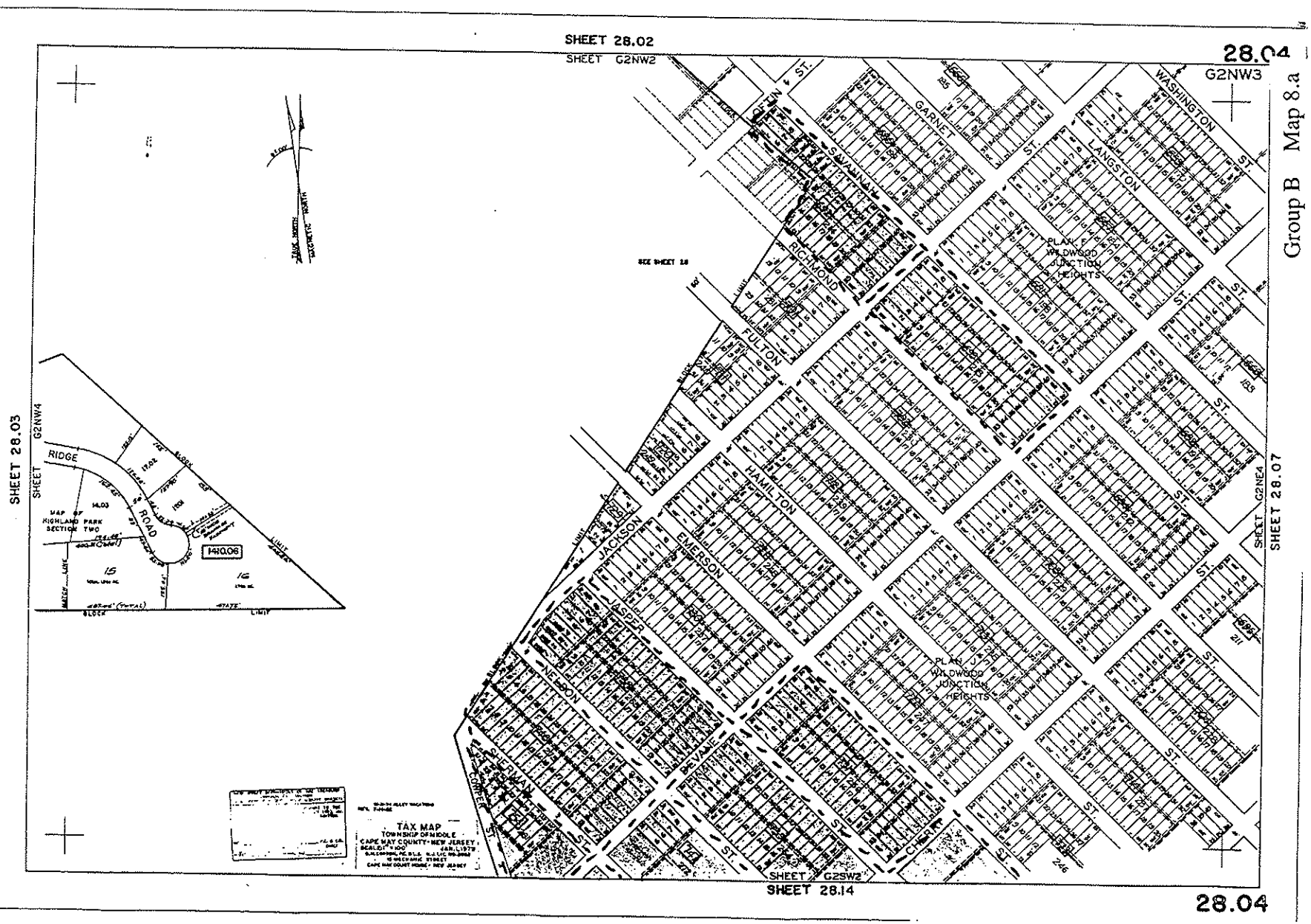
MIDDLE TWP



Group B Map 8

Group B Map 8

MIDDLE TWP



Group B Map 8.a

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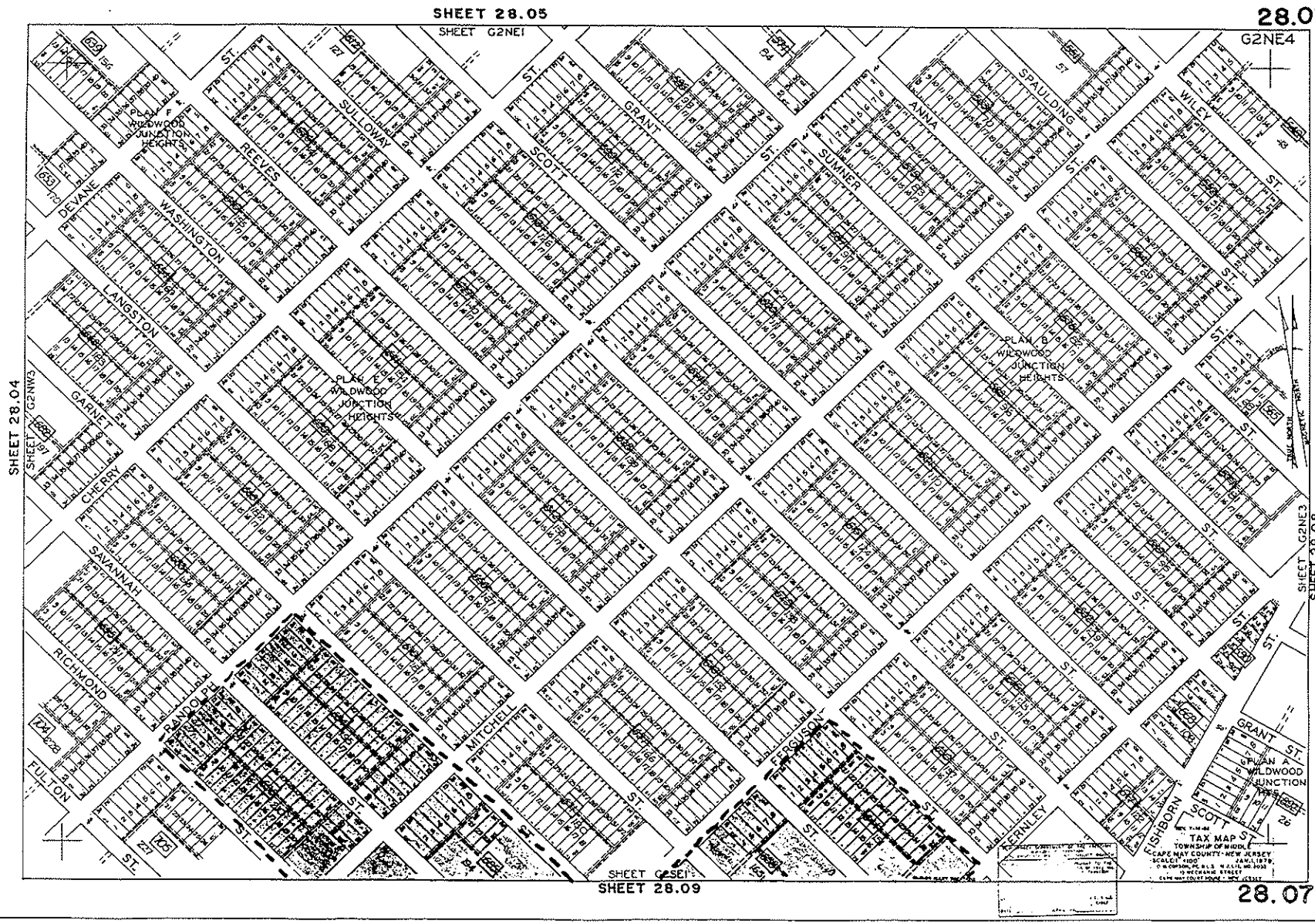

Group B Map 8.b

Group B Map 8.b

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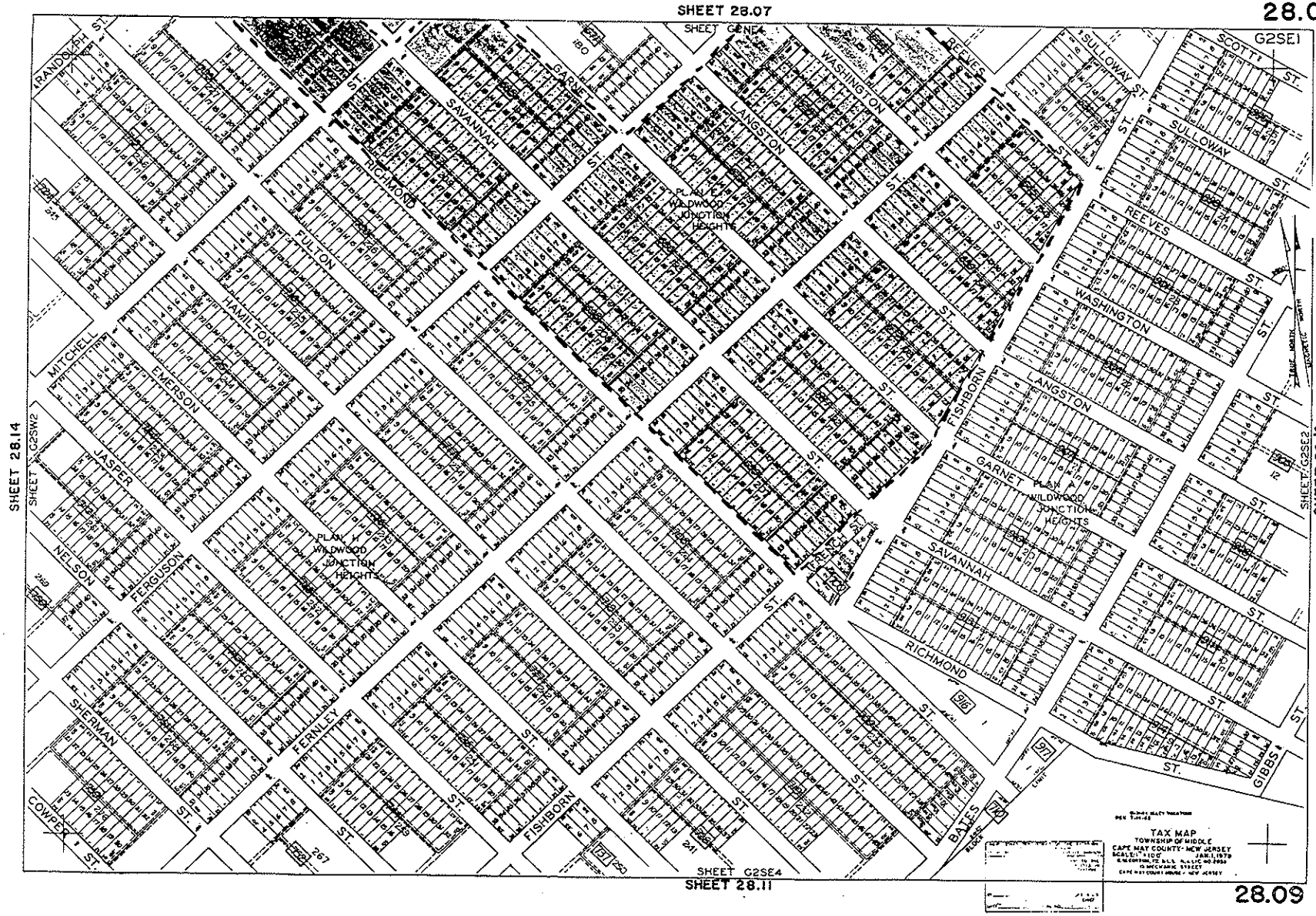


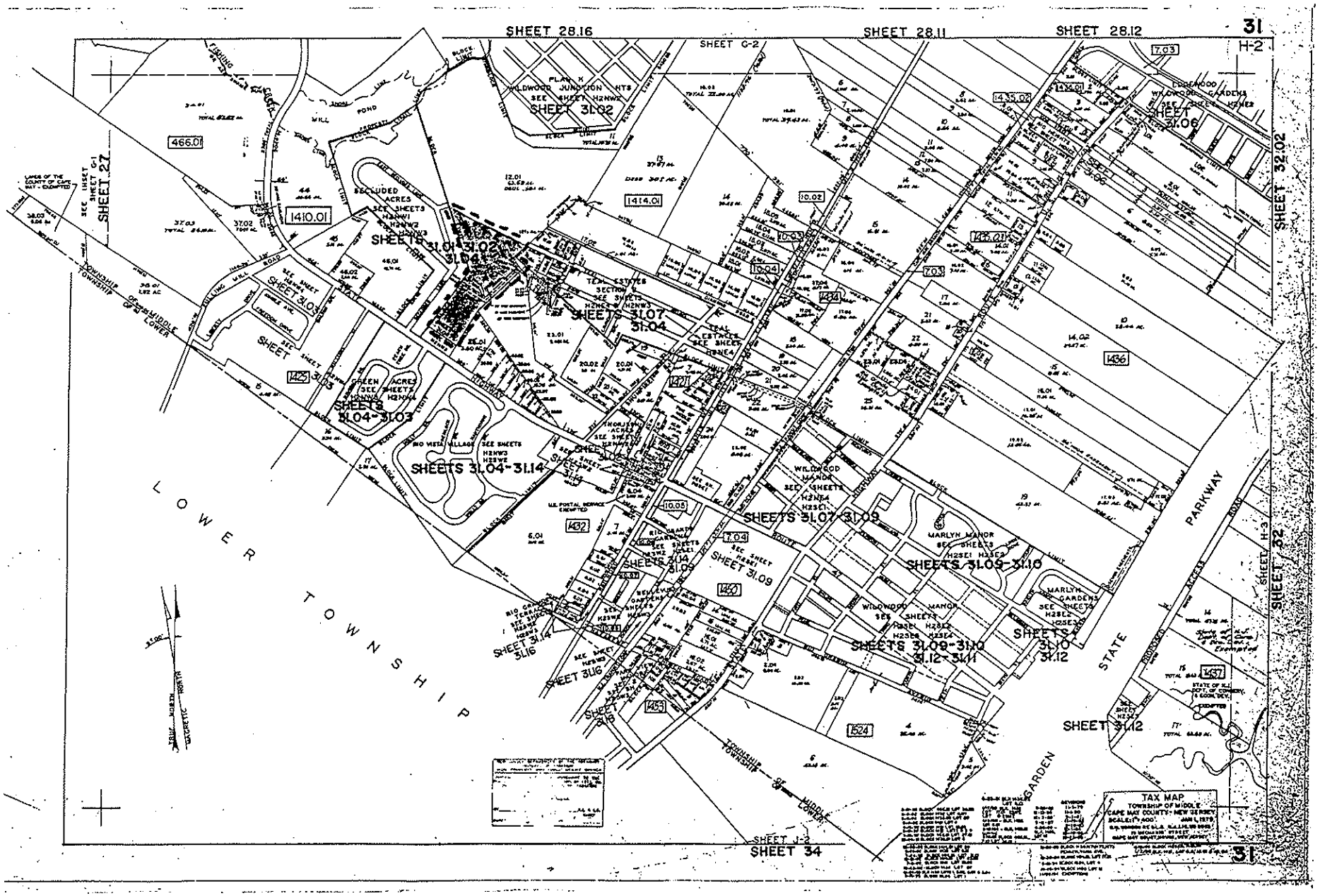
Group B Map 8.c

Group B Map 8.d

MIDDLE TWP

Group B Map 8.d

MIDDLE TWP



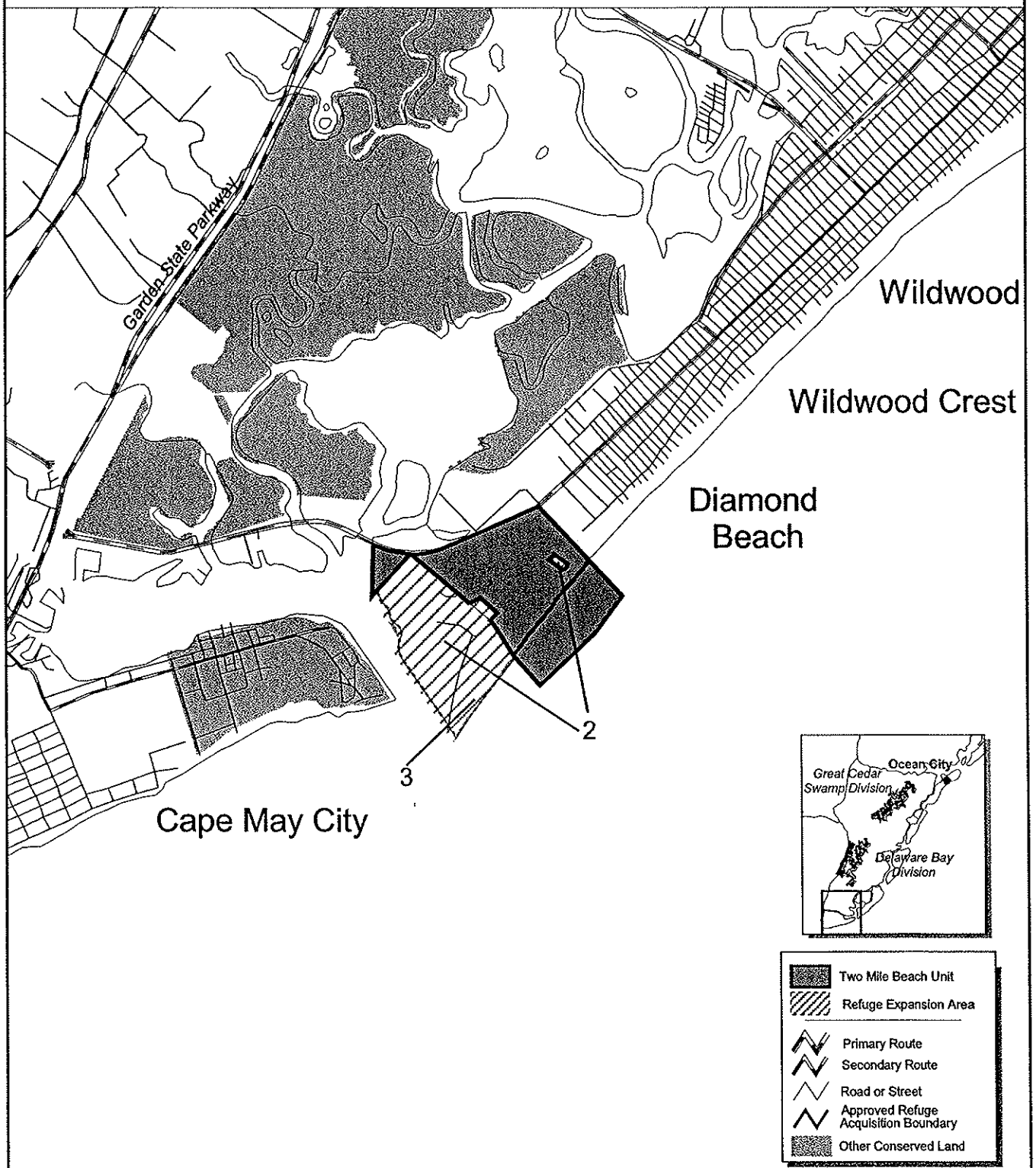
Group B Map 9

Group B Map 9

Refuge Expansion Areas

MAP C

Cape May National Wildlife Refuge, Two Mile Beach Unit,
Lower Township, Cape May County, New Jersey



Data Sources:
USGS 1:100,000 roads & hydro.
New Jersey - other protected land.
USFWS refuge boundaries & other refuge information.

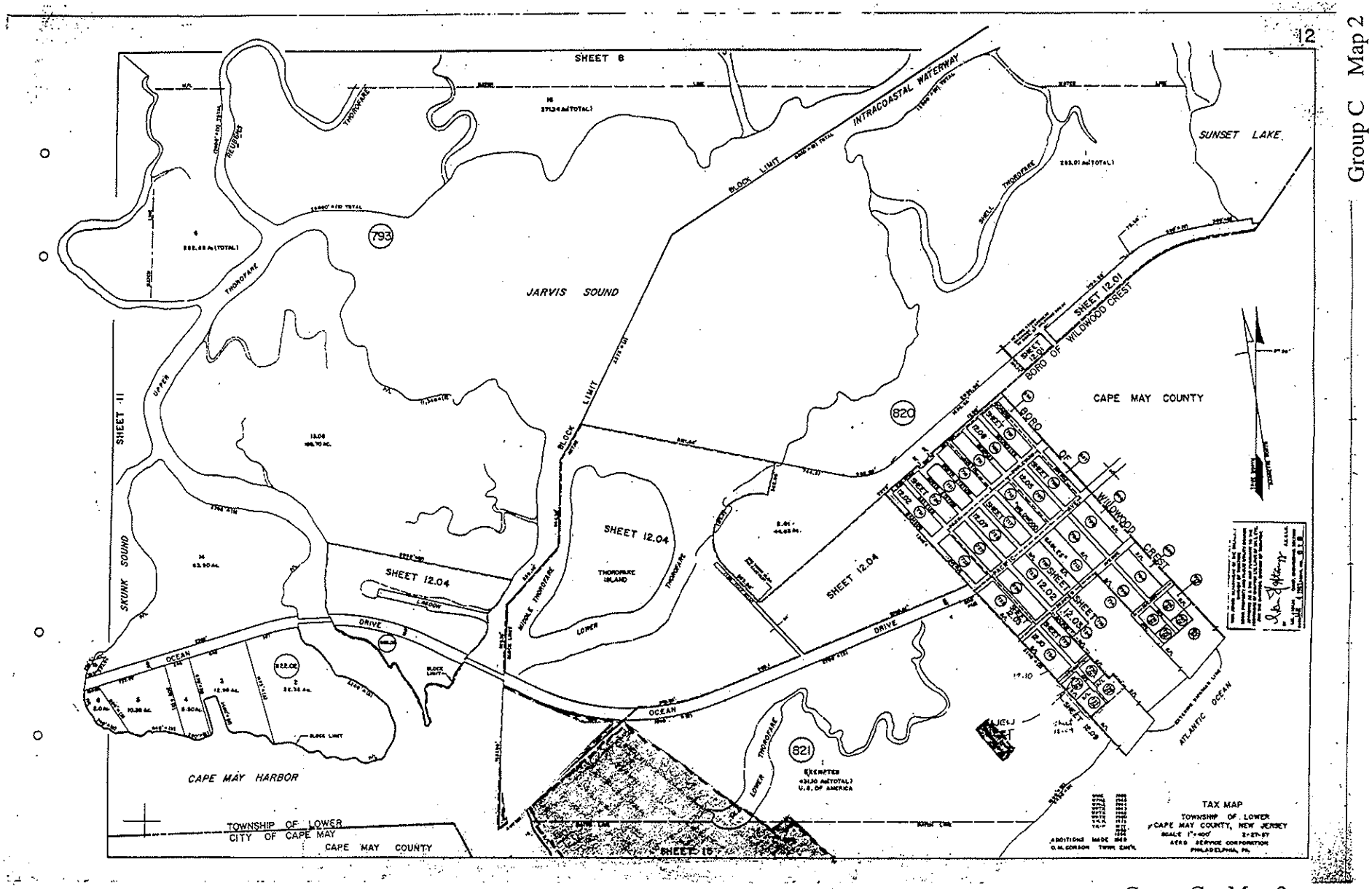
Map prepared for Jersey Coast Refuges Comprehensive Conservation Plan, November 2001.
This map is for planning purposes only.

0 0.5 1 1.5 2 Miles

0 0.3 0.6 0.9 1.2 1.5 Miles

N

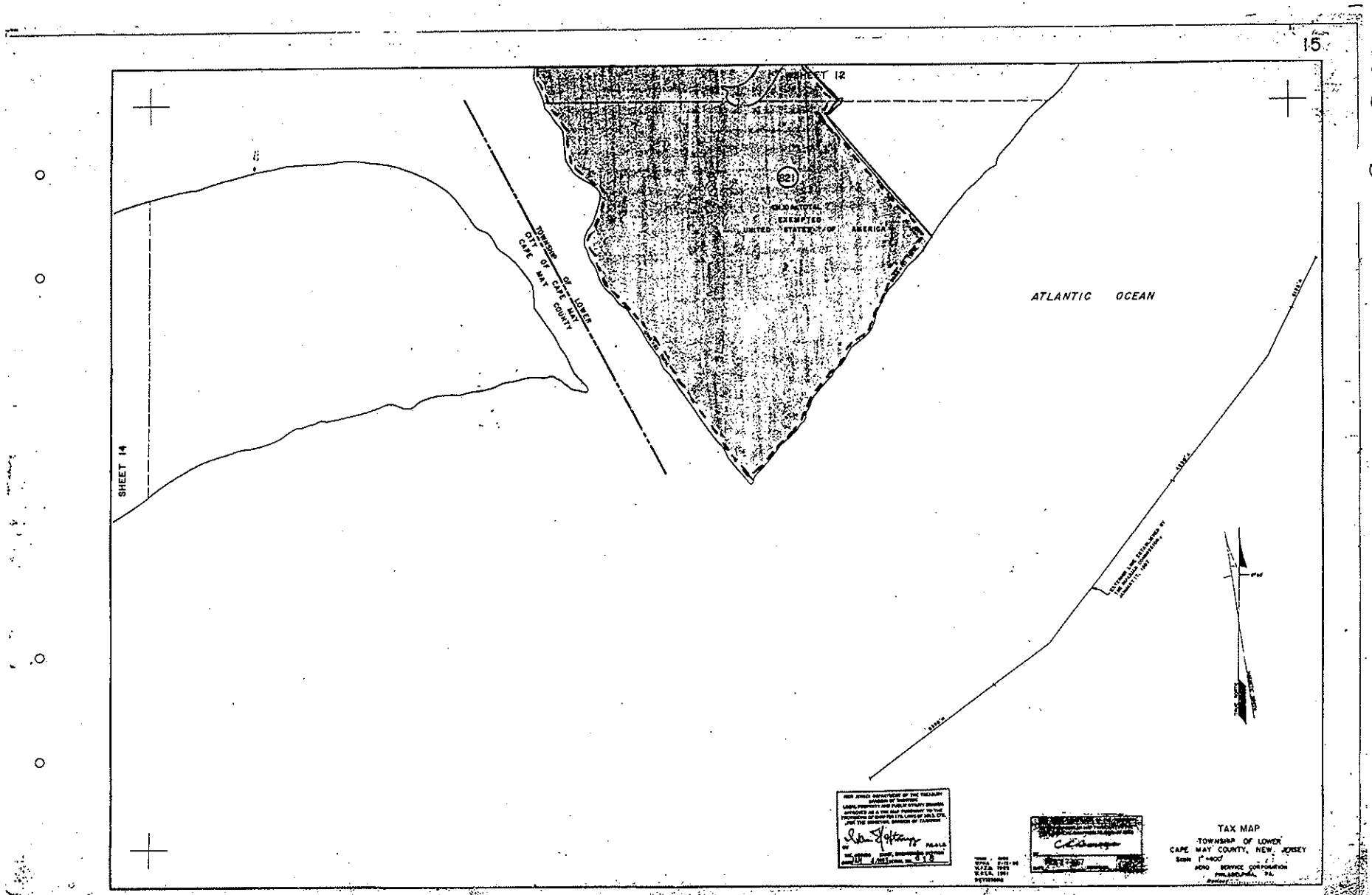
LOWER TWP



Group C Map 2

Group C Map 2

LOWER TWP



Group C Map 3

Group C Map 3

Upper Township

Priority	Block	Lot	Acres	Protection type	Acquisition type	Ownership
1	247	9Q	400	Fee Simple	Purchase	private
1	247	10Q	72.15	Fee Simple	Purchase	private
1	249	1	7	Fee Simple	Purchase	private
1	249	2	14.1	Fee Simple	Purchase	private
1	414	40Q	125.6	Fee Simple	Purchase	private
1	414	41	1.45	Fee Simple	Purchase	private
1	414	42	32.53	Fee Simple	Purchase	private
1	414	43	6.7	Fee Simple	Purchase	private
1	414	44	192	Fee Simple	Purchase	private
1	453	5.01	2.5	Fee Simple	Purchase	private
1	453	5.02	2.5	Fee Simple	Purchase	private
1	453	5.03	2.5	Fee Simple	Purchase	private
2	453	240	14.7	Fee Simple	Purchase	private
2	453	241	25	Fee Simple	Purchase	private
2	453	242	25	Fee Simple	Purchase	private
3	453	257.23	1.33	Fee Simple	Purchase	public
3	453	259.19	90	Fee Simple	Purchase	private
3	453	259.57	5.85	Fee Simple	Purchase	public
1	549	34	5.22	Fee Simple	Purchase	private
1	549	35	16.7	Fee Simple	Purchase	public
1	549	38	10	Fee Simple	Purchase	private
1	549	43	28	Fee Simple	Purchase	private
1	549	70	18	Fee Simple	Purchase	public
1	549	71	9.9	Fee Simple	Purchase	public
1	549	102	4	Fee Simple	Purchase	public
2	549	103	7.3	Fee Simple	Purchase	public
2	549	104	15.1	Fee Simple	Purchase	public
3	549	105	12.6	Fee Simple	Purchase	private
3	549	106	13.8	Fee Simple	Purchase	private
3	549	107	7.1	Fee Simple	Purchase	private
3	549	108	13.34	Fee Simple	Purchase	private
3	549	112	6.2	Fee Simple	Purchase	private
1	639	3	10.65	Fee Simple	Purchase	private
1	639	6	13.96	Fee Simple	Purchase	private
1	639	7	10.69	Fee Simple	Purchase	public
1	639	8Q	13.73	Fee Simple	Purchase	private
1	639	10	6.98	Fee Simple	Purchase	private
1	639	11	8.47	Fee Simple	Purchase	private
1	640	2	8.08	Fee Simple	Purchase	private
1	640	4	2.27	Fee Simple	Purchase	private
1	640	6	3.2	Fee Simple	Purchase	public
Upper Township Total:			**1266.2**			

Dennis Township

Priority	Block	Lot	Acres	Protection type	Acquisition type	Ownership
3	120	40Q	31.23	Fee Simple	Purchase	private
3	120	44	25.18	Fee Simple	Purchase	private
3	120	50	11.2	Fee Simple	Purchase	private
3	120	63	16.1	Fee Simple	Purchase	private
3	120	65	0.56	Fee Simple	Purchase	private
3	120	66	4	Fee Simple	Purchase	private
3	120	67	9	Fee Simple	Purchase	private
3	120	74	70	Fee Simple	Purchase	private
3	120	75	45.5	Fee Simple	Purchase	private
2	224	71.02	2.24	Fee Simple	Purchase	private
1	245	1Q	75.01	Fee Simple	Purchase	private
1	251	22	15	Fee Simple	Purchase	private
1	251	101	35	Fee Simple	Purchase	private
1	251	102	8.07	Fee Simple	Purchase	private
1	251	103	13.5	Fee Simple	Purchase	private
1	251	104	3.96	Fee Simple	Purchase	private
Dennis Township Total:			**365.55**			

Middle Township

Priority	Block	Lot	Acres	Protection type	Acquisition type	Ownership
1	50	15	20	Fee Simple	Purchase	private
1	50	16	1.72	Fee Simple	Purchase	private
1	50	22.01	25.9	Fee Simple	Purchase	private
1	50	24	1.22	Fee Simple	Purchase	public
1	50	25	0.67	Fee Simple	Purchase	public
1	50	26	13.83	Fee Simple	Purchase	private
1	50	28	0.6	Fee Simple	Purchase	private
1	50	35.01	11.355	Fee Simple	Purchase	private
1	50	36.02	7.6	Fee Simple	Purchase	private
1	50	38Q	9	Fee Simple	Purchase	private
1	51	9Q	20	Fee Simple	Purchase	private
1	51	12.01	23.67	Fee Simple	Purchase	private
1	51	39	23.3	Fee Simple	Purchase	private
1	51	40	1.87	Fee Simple	Purchase	private
1	51	41	27	Fee Simple	Purchase	private
1	51	47.01	85.314	Fee Simple	Purchase	public
1	51	47.02	42.44	Fee Simple	Purchase	public
1	51	48	0.3	Fee Simple	Purchase	private
1	52	9	17.98	Fee Simple	Purchase	private
1	52	11.01	13	Fee Simple	Purchase	private
1	52	18	6.97	Fee Simple	Purchase	private
1	52	20	10.13	Fee Simple	Purchase	private
3	52	22.02	0.93	Fee Simple	Purchase	private
1	52	24Q	32.54	Fee Simple	Purchase	private
1	56.01	41	19.47	Fee Simple	Purchase	public
1	56.01	42	12.55	Fee Simple	Purchase	private
1	56.01	43	13.14	Fee Simple	Purchase	private
1	56.01	44.01	40.78	Fee Simple	Purchase	private
1	56.01	45.01	31.98	Fee Simple	Purchase	public
1	56.01	47Q	8.8	Fee Simple	Purchase	private
1	65	1,2-28	2.62	Fee Simple	Purchase	private
1	66	1,2-19	1.95	Fee Simple	Purchase	private
1	67	1,2-7	0.74	Fee Simple	Purchase	private
1	68	1,2-8	1.32	Fee Simple	Purchase	private
1	69	1,2-11	1.61	Fee Simple	Purchase	private
1	70	1,2-15	0.92	Fee Simple	Purchase	private
1	71	1,2-4	0.38	Fee Simple	Purchase	private
1	72	1,2-13	0.88	Fee Simple	Purchase	private
1	73	1,2-11	0.54	Fee Simple	Purchase	private
1	74	6	0.11	Fee Simple	Purchase	public
1	75	1,2-37	1.9	Fee Simple	Purchase	private
1	76	1,2-10	0.97	Fee Simple	Purchase	public
1	77	2	4.77	Fee Simple	Purchase	public
1	77	4	7.78	Fee Simple	Purchase	public
1	77	5	11.75	Fee Simple	Purchase	public
1	165.01	24.17	9.2	Fee Simple	Purchase	private
1	167.01	65	9.98	Fee Simple	Purchase	private
1	168	4	46.98	Fee Simple	Purchase	private
1	168	5	14.25	Fee Simple	Purchase	public

Middle Township

Priority	Block	Lot	Acres	Protection type	Acquisition type	Ownership
1	168	6	9.25	Fee Simple	Purchase	public
1	168	7	21.65	Fee Simple	Purchase	public
1	168	8	14.13	Fee Simple	Purchase	private
2	472	11.01Q	83.21	Fee Simple	Purchase	private
3	472	18.05	5.21	Fee Simple	Purchase	public
2	472	20Q	30	Fee Simple	Purchase	private
2	472	31.02Q	30	Fee Simple	Purchase	private
2	472	34Q	18.46	Fee Simple	Purchase	private
2	472	38Q	30	Fee Simple	Purchase	private
2	472	41Q	20	Fee Simple	Purchase	private
1	477	1.01	0.23	Fee Simple	Purchase	public
1	477	5	0.09	Fee Simple	Purchase	private
1	481	1	1.18	Fee Simple	Purchase	public
1	481	3	0.17	Fee Simple	Purchase	public
1	481	6	0.06	Fee Simple	Purchase	public
1	486	1	0.6	Fee Simple	Purchase	public
1	486	5	0.4	Fee Simple	Purchase	public
1	486	14	0.18	Fee Simple	Purchase	private
1	486	21	0.11	Fee Simple	Purchase	public
1	486	23	0.11	Fee Simple	Purchase	public
1	491	1	0.77	Fee Simple	Purchase	public
1	491	5	0.24	Fee Simple	Purchase	public
1	491	10	0.34	Fee Simple	Purchase	public
1	491	16	0.08	Fee Simple	Purchase	public
1	496	1	0.59	Fee Simple	Purchase	public
1	496	9	0.55	Fee Simple	Purchase	public
1	496	15	0.16	Fee Simple	Purchase	private
1	496	20	0.06	Fee Simple	Purchase	public
1	496	23	0.11	Fee Simple	Purchase	public
1	501	1	0.87	Fee Simple	Purchase	public
1	501	4	0.3	Fee Simple	Purchase	private
1	501	13	0.23	Fee Simple	Purchase	public
1	501	16	0.11	Fee Simple	Purchase	public
1	506	1	0.88	Fee Simple	Purchase	public
1	506	10	0.34	Fee Simple	Purchase	public
1	506	16	0.31	Fee Simple	Purchase	public
1	511	1	0.94	Fee Simple	Purchase	public
1	511	3	0.06	Fee Simple	Purchase	private
1	511	5	0.11	Fee Simple	Purchase	private
1	511	7	0.23	Fee Simple	Purchase	public
1	511	16	0.13	Fee Simple	Purchase	private
1	516	1	0.49	Fee Simple	Purchase	public
1	516	3	0.3	Fee Simple	Purchase	public
1	644	1	0.11	Fee Simple	Purchase	private
1	644	3	0.11	Fee Simple	Purchase	private
1	644	5	0.3	Fee Simple	Purchase	private
1	644	9	1.03	Fee Simple	Purchase	public
1	644	22	0.29	Fee Simple	Purchase	private
1	644	29	0.06	Fee Simple	Purchase	public

Middle Township

Priority	Block	Lot	Acres	Protection type	Acquisition type	Ownership
1	644	30	0.11	Fee Simple	Purchase	private
1	644	32	0.3	Fee Simple	Purchase	private
1	645	1	0.23	Fee Simple	Purchase	public
1	645	5	0.24	Fee Simple	Purchase	private
1	645	9	0.29	Fee Simple	Purchase	public
1	645	10	0.11	Fee Simple	Purchase	public
1	645	14	0.23	Fee Simple	Purchase	public
1	645	23	0.17	Fee Simple	Purchase	public
1	658	1	0.24	Fee Simple	Purchase	public
1	658	5	0.3	Fee Simple	Purchase	public
1	658	9	0.06	Fee Simple	Purchase	public
1	658	10	0.06	Fee Simple	Purchase	public
1	658	11	1.21	Fee Simple	Purchase	public
1	658	12	0.34	Fee Simple	Purchase	public
1	658	30	0.11	Fee Simple	Purchase	public
1	659	1	0.46	Fee Simple	Purchase	public
1	659	5	0.8	Fee Simple	Purchase	public
1	659	9	0.06	Fee Simple	Purchase	private
1	659	16	0.29	Fee Simple	Purchase	public
1	659	23	0.11	Fee Simple	Purchase	public
1	659	27	0.11	Fee Simple	Purchase	private
1	659	29	0.06	Fee Simple	Purchase	public
1	672	1	0.29	Fee Simple	Purchase	public
1	672	5	0.29	Fee Simple	Purchase	public
1	672	10	1.32	Fee Simple	Purchase	public
1	672	18	0.23	Fee Simple	Purchase	public
1	672	22	0.11	Fee Simple	Purchase	public
1	672	27	0.06	Fee Simple	Purchase	public
1	673	1	0.52	Fee Simple	Purchase	public
1	673	5	0.29	Fee Simple	Purchase	public
1	673	15	0.46	Fee Simple	Purchase	private
1	673	17	0.17	Fee Simple	Purchase	public
1	673	21	0.63	Fee Simple	Purchase	public
1	684	14	0.47	Fee Simple	Purchase	public
1	684	17	0.34	Fee Simple	Purchase	public
1	684	20	0.29	Fee Simple	Purchase	private
1	684	22	0.17	Fee Simple	Purchase	private
1	684	26	0.17	Fee Simple	Purchase	private
1	685	1	0.11	Fee Simple	Purchase	private
1	685	3	0.4	Fee Simple	Purchase	public
1	685	5	0.59	Fee Simple	Purchase	public
1	685	11	0.52	Fee Simple	Purchase	public
1	685	15	0.11	Fee Simple	Purchase	public
1	685	17	0.06	Fee Simple	Purchase	private
1	685	27	0.29	Fee Simple	Purchase	private
1	685	37	0.23	Fee Simple	Purchase	public
1	686	1	1.15	Fee Simple	Purchase	public
1	686	4	0.52	Fee Simple	Purchase	public
1	686	7	0.11	Fee Simple	Purchase	public

Middle Township

Priority	Block	Lot	Acres	Protection type	Acquisition type	Ownership
1	686	10	0.06	Fee Simple	Purchase	public
1	686	17	0.11	Fee Simple	Purchase	public
1	686	23	0.06	Fee Simple	Purchase	private
1	686	24	0.11	Fee Simple	Purchase	private
1	686	29	0.17	Fee Simple	Purchase	public
1	687	1	1.09	Fee Simple	Purchase	public
1	687	11	0.29	Fee Simple	Purchase	public
1	687	16	0.23	Fee Simple	Purchase	private
1	687	20	0.6	Fee Simple	Purchase	private
1	687	23	0.11	Fee Simple	Purchase	public
1	692	5	0.57	Fee Simple	Purchase	public
1	692	13	0.11	Fee Simple	Purchase	public
1	692	17	0.23	Fee Simple	Purchase	private
1	692	21	0.06	Fee Simple	Purchase	private
1	692	26	0.11	Fee Simple	Purchase	private
1	692	28	0.17	Fee Simple	Purchase	private
1	692	31	0.57	Fee Simple	Purchase	private
1	693	1	0.23	Fee Simple	Purchase	private
1	693	5	1.03	Fee Simple	Purchase	public
1	693	9	0.06	Fee Simple	Purchase	public
1	693	10	0.52	Fee Simple	Purchase	public
1	693	27	0.29	Fee Simple	Purchase	public
1	693	37	0.06	Fee Simple	Purchase	public
1	693	38	0.11	Fee Simple	Purchase	private
1	696	12	1.57	Fee Simple	Purchase	public
1	697	1	1.66	Fee Simple	Purchase	public
1	697	10	0.23	Fee Simple	Purchase	public
1	697	15	0.11	Fee Simple	Purchase	private
1	697	22	0.29	Fee Simple	Purchase	public
1	698	1	0.57	Fee Simple	Purchase	public
1	698	3	0.69	Fee Simple	Purchase	private
1	698	12	0.11	Fee Simple	Purchase	public
1	698	20	0.57	Fee Simple	Purchase	public
1	698	22	0.06	Fee Simple	Purchase	public
1	698	23	0.23	Fee Simple	Purchase	public
1	698	29	0.06	Fee Simple	Purchase	public
1	699	1	0.46	Fee Simple	Purchase	public
1	699	9	0.4	Fee Simple	Purchase	public
1	699	10	0.17	Fee Simple	Purchase	public
1	699	19	0.06	Fee Simple	Purchase	private
1	699	20	0.17	Fee Simple	Purchase	private
1	699	21	0.29	Fee Simple	Purchase	public
1	699	22	0.06	Fee Simple	Purchase	public
1	699	23	0.06	Fee Simple	Purchase	public
1	699	26	0.11	Fee Simple	Purchase	public
1	699	30	0.11	Fee Simple	Purchase	public
1	699	32	0.29	Fee Simple	Purchase	public
1	699	35	0.11	Fee Simple	Purchase	public
1	712	5	0.29	Fee Simple	Purchase	private

Middle Township

Priority	Block	Lot	Acres	Protection type	Acquisition type	Ownership
1	712	11	0.23	Fee Simple	Purchase	private
1	712	22	0.34	Fee Simple	Purchase	public
1	712	28	0.23	Fee Simple	Purchase	public
1	712	39	0.11	Fee Simple	Purchase	public
1	714	10	0.57	Fee Simple	Purchase	public
1	714	15	0.34	Fee Simple	Purchase	private
1	714	27	0.23	Fee Simple	Purchase	public
1	714	30	0.4	Fee Simple	Purchase	private
1	714	33	0.11	Fee Simple	Purchase	private
1	714	36	0.06	Fee Simple	Purchase	public
1	731	1	0.29	Fee Simple	Purchase	public
1	731	5	0.23	Fee Simple	Purchase	private
1	731	10	0.69	Fee Simple	Purchase	public
1	731	14	0.46	Fee Simple	Purchase	public
1	731	20	0.29	Fee Simple	Purchase	public
1	731	24	0.11	Fee Simple	Purchase	public
1	731	26	0.11	Fee Simple	Purchase	private
1	731	39	0.11	Fee Simple	Purchase	public
1	732	1	0.69	Fee Simple	Purchase	public
1	732	4	0.06	Fee Simple	Purchase	public
1	732	9	0.11	Fee Simple	Purchase	private
1	732	11	0.24	Fee Simple	Purchase	private
1	732	15	0.46	Fee Simple	Purchase	public
1	732	17	0.17	Fee Simple	Purchase	private
1	732	20	0.29	Fee Simple	Purchase	private
1	732	32	0.06	Fee Simple	Purchase	public
1	732	37	0.23	Fee Simple	Purchase	public
1	738	9	0.17	Fee Simple	Purchase	private
1	738	12	0.11	Fee Simple	Purchase	private
1	738	14	0.18	Fee Simple	Purchase	private
1	738	17	0.23	Fee Simple	Purchase	private
1	738	21	0.17	Fee Simple	Purchase	private
1	738	22	0.17	Fee Simple	Purchase	public
1	738	25	0.47	Fee Simple	Purchase	private
1	738	29	0.23	Fee Simple	Purchase	private
1	738	39	0.11	Fee Simple	Purchase	private
1	739	1	0.11	Fee Simple	Purchase	public
1	739	3	0.11	Fee Simple	Purchase	private
1	739	5	1.03	Fee Simple	Purchase	public
1	739	9	0.17	Fee Simple	Purchase	private
1	739	17	0.11	Fee Simple	Purchase	private
1	739	20	0.4	Fee Simple	Purchase	public
1	739	35	0.17	Fee Simple	Purchase	private
1	739	38	0.18	Fee Simple	Purchase	public
1	740	1	1.62	Fee Simple	Purchase	public
1	740	9	0.52	Fee Simple	Purchase	public
1	740	10	0.11	Fee Simple	Purchase	public
1	740	33	0.06	Fee Simple	Purchase	public
1	746	2	2.36	Fee Simple	Purchase	private

Middle Township

Priority	Block	Lot	Acres	Protection type	Acquisition type	Ownership
1	746	3	0.06	Fee Simple	Purchase	private
1	747	1	0.8	Fee Simple	Purchase	public
1	747	11	0.23	Fee Simple	Purchase	public
1	747	12	0.29	Fee Simple	Purchase	public
1	747	15	0.11	Fee Simple	Purchase	public
1	747	17	0.23	Fee Simple	Purchase	private
1	747	23	0.11	Fee Simple	Purchase	public
1	747	25	0.4	Fee Simple	Purchase	public
1	747	33	0.11	Fee Simple	Purchase	public
1	748	1	0.29	Fee Simple	Purchase	private
1	748	5	0.4	Fee Simple	Purchase	public
1	748	7	0.11	Fee Simple	Purchase	public
1	748	11	0.23	Fee Simple	Purchase	public
1	748	15	0.46	Fee Simple	Purchase	public
1	748	21	0.46	Fee Simple	Purchase	public
1	748	33	0.34	Fee Simple	Purchase	public
1	754	20	0.47	Fee Simple	Purchase	public
1	754	21	0.29	Fee Simple	Purchase	private
1	754	28	0.34	Fee Simple	Purchase	public
1	755	1	1.2	Fee Simple	Purchase	public
1	755	3	0.06	Fee Simple	Purchase	private
1	755	4	0.29	Fee Simple	Purchase	private
1	755	11	0.34	Fee Simple	Purchase	public
1	755	25	0.29	Fee Simple	Purchase	public
1	755	39	0.11	Fee Simple	Purchase	private
1	756	1	0.23	Fee Simple	Purchase	public
1	756	5	0.4	Fee Simple	Purchase	public
1	756	9	0.4	Fee Simple	Purchase	public
1	756	16	0.11	Fee Simple	Purchase	private
1	756	18	0.17	Fee Simple	Purchase	public
1	756	22	0.11	Fee Simple	Purchase	private
1	756	24	0.4	Fee Simple	Purchase	private
1	756	34	0.4	Fee Simple	Purchase	public
1	763	12	0.29	Fee Simple	Purchase	public
1	763	15	0.4	Fee Simple	Purchase	private
1	763	22	0.52	Fee Simple	Purchase	private
1	764	5	0.29	Fee Simple	Purchase	public
1	764	10	0.11	Fee Simple	Purchase	public
1	764	12	0.34	Fee Simple	Purchase	public
1	915	5	0.8	Fee Simple	Purchase	public
1	1401.01	12.01	40	Fee Simple	Purchase	private
2	1401.01	32Q	16.5	Fee Simple	Purchase	private
2	1410.01	35.01Q	108	Fee Simple	Purchase	private
1	1410.01	36	5	Fee Simple	Purchase	private
1	1410.01	41.01	68	Fee Simple	Purchase	private
Middle Township Total:			**1215.819**			

Lower Township

Priority	Block	Lot	Acres	Protection type	Acquisition type	Ownership
1	821	1.02		Fee Simple	Transfer	public
1	821	1.04		Fee Simple	Transfer	public
1	821	1.05		Fee Simple	Transfer	public
1	821	1.06	530	Fee Simple	Transfer	public
1	821	2	16.08	Fee Simple	Purchase	private
Lower Township Total:			**546.08**			

Cape May National Wildlife Refuge
24 Kimbles Beach Road
Cape May Court House, NJ 08210-2078
609/463 0994
609/463 1667 Fax
capemay.fws.gov
E-mail: r5rw_cpmnwr@fws.gov

Federal Relay Service
for the deaf and hard-of-hearing
1 800/877 8339

U.S. Fish & Wildlife Service
http://www.fws.gov

For Refuge Information
1 800/344 WILD

June 2004

Red Knot
Kevin Karlson