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CAPE MAY NATIONAL WILDLIFE REFUGE
CAPE MAY COURT HOUSE, NEW JERSEY
ANNUAL NARRATIVE REPORT
CALENDAR YEARS 1993 AND 1994

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
NATIONAL WILDLIFE REFUGE SYSTEM

CAPE MAY

NATIONAL WILDLIFE REFUGE



Cape May County, New Jersey

ANNUAL NARRATIVE REPORT

Calendar Years 1993 & 1994

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Cape May Court House, New Jersey

ANNUAL NARRATIVE REPORT

Calendar Years 1993 and 1994

U. S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

REVIEW AND APPROVALS

CAPE MAY NATIONAL WILDLIFE REFUGE

Cape May County, New Jersey

ANNUAL NARRATIVE REPORT

Calendar Years 1993 & 1994

Stephen Citzert
Refuge Manager

3/30/96
Date

Donald M. Fricker
Regional Office Approval

4/5/96
Date

INTRODUCTION

The U. S. Fish and Wildlife Service established the Cape May National Wildlife Refuge on January 20, 1989 under the authority of the Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j: 70 Stat. 1119), as amended. The Service purchased the first property for the refuge from The Nature Conservancy on June 26, 1989. As of December 31, 1994, the Service had purchased 6,422 acres out of the 16,765 acres within the approved refuge acquisition boundary.

The abundance and diversity of Cape May's flora and fauna have long interested naturalists. The spectacular Spring and Fall raptor migrations attract thousands of biologists, naturalists and birders yearly. The presence of southern plant species increases the diversity of local plant communities. In the spring, the Delaware Bay shoreline hosts North America's second largest concentration of shorebirds. In May, virtually the entire North American population of Red Knots (150,000 to 200,000) gathers along strips of beach such as Reeds Beach and Moores Beach. Hundreds of thousands of sanderlings, semipalmated sandpipers and ruddy turnstones scramble along the beach to eat horseshoe crab eggs accompanied by lesser numbers of other shorebird species. The horseshoe crabs themselves can sometimes reach densities of over 100,000 per kilometer near Reeds Beach.

The unique configuration and location of Cape May concentrates songbirds, raptors and woodcock as they funnel south to Cape May Point during the Fall. Faced with 12 miles of water to cross at the Delaware Bay, migrants linger in the area to rest and feed until favorable winds allow them to cross the Bay or head north along the eastern shore of the Delaware Bay. More than 200,000 hawks, 80 to 90 percent of them immatures, pass through Cape May every Fall. Immature individuals are less experienced, they use more energy and need more time to secure food; they are consequently more vulnerable. Although songbird numbers are relatively difficult to estimate, Peter Dunne of the New Jersey Audubon Society has said that he has seen songbird migrations "so massive that forest birds were wanting for perches; swallows in flocks were so dense their wingtips brushed people's faces."

Although these large flocks often accumulate at Cape May Point, many species distribute themselves around the peninsula, frequently retreating into the refuge acquisition area for feeding and evening roosting. Studies on habitat use by migrating songbirds have shown that forests are among the area's most valuable habitat, with the largest number and greatest diversity of avian species. The refuge is currently targeting upland, forested areas for acquisition. Of the 22 plant community types that may be found on the refuge (see Appendix 2), 14 are forested and three of those are listed by the State as high priorities for conservation. The refuge acquisition area contains a large amount of one of the most critically imperiled plant communities, the Cape May Lowland Swamp.

The refuge is divided into two approximately equal divisions, the Great Cedar Swamp and the Delaware Bay Divisions, and fourteen units in six drainages (Cedar Swamp Creek, Dennis Creek, Bidwell Creek, Dias Creek, Green Creek and Fishing Creek).

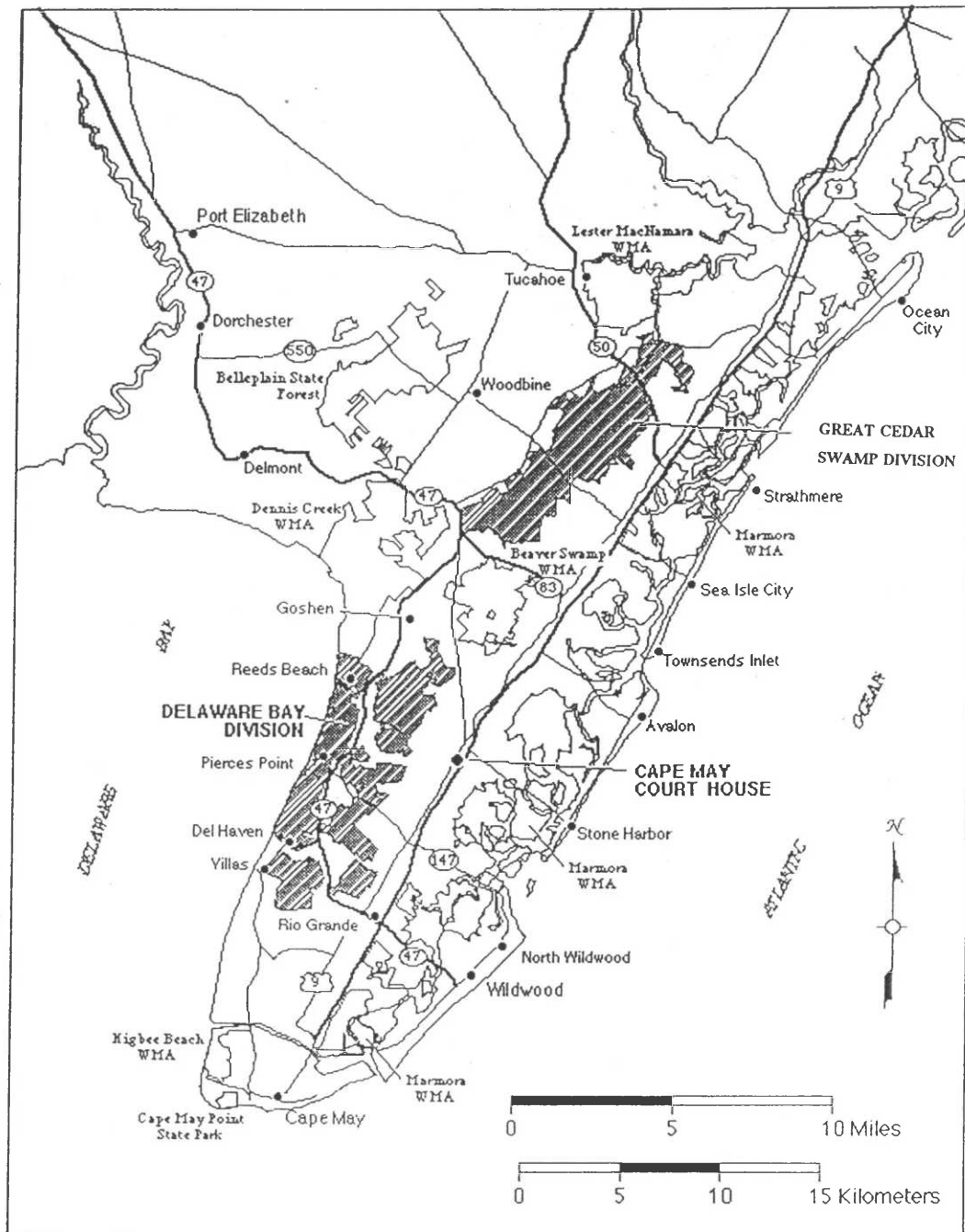
Great Cedar Swamp Division

Cedar Creek North
Cedar Creek Middle
Cedar Creek South
Dennis Creek North
Dennis Creek South

Delaware Bay Division

North Bay
Middle Bay
South Bay
Bidwell Creek North
Bidwell Creek East
Bidwell Creek South
Dias Creek
Green Creek
Fishing Creek

The following map shows the currently approved refuge acquisition area.



The approved acquisition boundaries of the Cape May National Wildlife Refuge.

TABLE OF CONTENTS

A. HIGHLIGHTS	1
B. CLIMATIC CONDITIONS	2
C. LAND ACQUISITION	3
1. Fee Title	3
2. Other	3
Rollback Taxes	3
D. PLANNING	5
1. Master Plan	5
2. Management Plan	5
3. Public Participation	5
4. Compliance with Environmental and Cultural Resource Mandates	6
5. Research and Investigations	6
E. ADMINISTRATION	7
1. Personnel	7
2. Youth Programs	Nothing to Report
3. Other Manpower Programs	Nothing to Report
4. Volunteer Program	8
5. Funding	10
Revenue Sharing	11
6. Safety	11
7. Technical Assistance	11
8. Other	14
F. HABITAT MANAGEMENT	15
1. General	15
2. Wetlands	Nothing to Report
3. Forests	Nothing to Report
4. Cropland	Nothing to Report
5. Grasslands	Nothing to Report
6. Other Habitats	Nothing to Report
7. Grazing	Nothing to Report
8. Haying	15
9. Fire Management	Nothing to Report
10. Pest Control	15
11. Water Rights	Nothing to Report
Water Issues	Nothing to Report
12. Wilderness and Special Areas	Nothing to Report
13. WPA Easement Monitoring	Nothing to Report
G. WILDLIFE	16

1. Wildlife Diversity	Nothing to Report
2. Endangered and/or Threatened Species	16
3. Waterfowl	16
4. Marsh and Water Birds	16
5. Shorebirds, Gulls, Terns and Allied Species	16
6. Raptors	16
7. Other Migratory Birds	17
8. Game Animals	17
9. Marine Mammals	Nothing to Report
10. Other Resident Wildlife	17
11. Fisheries Resource	Nothing to Report
12. Wildlife Propagation and Stocking	Nothing to Report
13. Surplus Animal Disposal	Nothing to Report
14. Scientific Collections	Nothing to Report
15. Animal Control	Nothing to Report
16. Marking and Banding	Nothing to Report
17. Disease Prevention and Control	Nothing to Report

H. PUBLIC USE	18
1. General	18
2. Outdoor Classrooms - Students	18
3. Outdoor Classrooms - Teachers	Nothing to Report
4. Interpretive Foot Trails	Nothing to Report
5. Interpretive Tour Routes	18
6. Interpretive Exhibits/Demonstrations	18
7. Other Interpretive Programs	Nothing to Report
8. Hunting	Nothing to Report
9. Fishing	Nothing to Report
10. Trapping	Nothing to Report
11. Wildlife Observation	18
12. Other Wildlife Oriented Recreation	18
13. Camping	Nothing to Report
14. Picnicking	Nothing to Report
15. Off-road Vehicling	Nothing to Report
16. Other Non-Wildlife oriented Recreation	Nothing to Report
17. Law Enforcement	18

I. EQUIPMENT AND FACILITIES	19
1. New Construction	Nothing to Report
2. Rehabilitation	19
3. Major Maintenance	Nothing to Report
4. Equipment Utilization and Replacement	19
5. Communications Systems	Nothing to Report
6. Computer Systems	19
7. Energy Conservation	Nothing to Report
8. Other	19

J. OTHER ITEMS	20
1. Cooperative Programs	20
2. County Open Space/Land Acquisition Coordination	Nothing to Report
3. Items of Interest	21
4. Credits	21
K. FEEDBACK	22
Appendices	23

A. HIGHLIGHTS

- The Service and the Wetland Institute entered into a memorandum of agreement for the Institute to maintain the Gamble House and to use it to house Wetland Institute summer interns. (Section J.1).
- Local community support for the refuge remains high. (Section J.3).
- The Station Public Use Plan was approved. (Section D.2).
- A decision document package to open the refuge to deer hunting was submitted to the Regional Office. (Section D.2).
- The Cape May Mosquito Control Commission received Corps of Engineers and State Department of Environmental Protection approval to restore tidal flow to the Green Creek Marsh, about 500 acres which lies within the approved refuge acquisition boundary. (Section E.7).

B. CLIMATIC CONDITIONS

Weather conditions in Cape May County, NJ are influenced by the Atlantic Ocean bringing in warm, moist air. Heavy winds and high seas that frequently accompany coastal storms flood a portion of the designated refuge acquisition area. Cape May is normally warm and humid in the summer months. Tourists flock into the area to vacation and enjoy nature. The winter months are usually mild and without snow. The average annual precipitation of 47.6 inches is well distributed throughout the year, with a slightly higher amounts occurring during the months of July and August. The average daily maximum temperature is 61° F and the average low is 48° F. The soils freeze for short periods during the winter, normally in January and February. The average length of the frost-free period is 180 days from mid-April to early November. The 1993 and 1994 climatic data are shown in Appendices 1a and 1b.

C. LAND ACQUISITION

1. Fee Title

During this reporting period, January 1, 1993 through December 31, 1994, the amount of Service-owned land increased from 5,787.03 acres to 6,422.26 acres--an increase of 635.23 acres. The Service expended \$2,339,623 for the 635.23 acres. See Table 1 below for additional information.

A summary of prior year acquisition activities are contained in Appendices 2 through 5. Tract by tract information on acquisition activities from October 1, 1992, the start of fiscal year 1993, through December 31, 1994 are contained in Appendices 6 and 7.

The house acquired with Tract 1011 in August 1993 is projected to become the refuge office in the near future.

In 1993, both Dennis Township and Upper Township submitted Permission to Examine Property forms for all township-owned properties within the approved refuge acquisition area.

Dates	Acres	Dollars
10/01/92-12/31/92	99.428	\$486,711
01/01/93-12/31/93	219.664	\$826,379
01/01/94-12/31/94	415.67	\$1,513,244
FY 93 10/01/92-09/30/93	202.888	\$804,211
FY 94 10/01/93-09/30/94	325.844	\$1,248,823
FY 95 10/01/94-12/31/94	206.03	\$773,300

Table 1: Summary of land acquisition activities by the calendar year (CY) and fiscal year (FY) either partially or wholly within the reporting period.

2. Other

Rollback Taxes

In 1992, the Service acquired Tract 360, which was assessed as farmland under the New Jersey Farmland Protection Act of 1964. This created problems related to the payment of rollback taxes required by the law. Lands assessed as farmland are taxed at ten percent of the normal real estate tax rate. However, when the use of the land changes from farmland, the law requires full real estate tax payment for the year in which the conversion occurs and the two preceding years. Conversion of the land to conservation use is a change from farming under the law.

To deal with this problem the refuge issued a special use permit to the former landowner to allow the existing farming practice, haying, to continue. After the Service has owned the property for three years, the refuge will be able to stop the farming practice without the Service or the Township having any complications due to the Farmland Protection Act.

The refuge had suggested to State legislators to introduce an amendment to the New Jersey Farmland Protection Act to exempt transactions with the United States of America from the Act, and to introduce legislation to set aside outstanding Farmland Protection Act judgements against the United States of America stemming from previous acquisitions.

D. PLANNING

1. Master Plan

The Station Management Plan continues to serve as the Station Master Plan. The plan was approved by the Regional Office, Assistant Regional Director for Refuges and Wildlife, on November 30, 1992. Short term management is focusing on land acquisition, establishing a refuge office on Service property, and opening the refuge to public use.

On July 31, 1993, the Service Director approved the Preliminary Project Proposal for a 5,000-acre expansion for the refuge. The expansion would increase the approved acquisition area of the refuge to about 21,700 acres. The Land Acquisition Planning Section of the Regional Realty Office will prepare the Environmental Assessment for the proposed expansion.

2. Management Plan

Station Public Use Issues, Objectives and the Station Message were approved by the Regional Office, Acting Associate Manager Refuges North, on August 3, 1993. The Draft Station Public Use Plan was approved by the Regional Office, Associate Manager Refuges North, on February 7, 1994. The Final Station Public Use Plan was approved by the Regional Office, Associate Manager Refuges North, on June 17, 1994. The refuge thanks Outdoor Recreation Planner (ORP) Tom Comish, from the Regional Office, for coming to the Station in September 1993 to discuss public use with us and for putting together the first Public Use Plan draft.

The Station Safety Plan was approved by the Regional Office, Associate Manager Refuges North, on January 13, 1994.

The Station Scope of Collection Statement was approved by the Regional Office, Associate Manager Refuges South, on July 11, 1994.

3. Public Participation

During the first half of 1993, the refuge conducted a broad scoping process for developing the draft Public Use Plan. Refuge personnel met with the Committees of Middle, Dennis and Upper Township and the Borough of Woodbine, the Cape May County Planning Board, the President of the New Jersey Federated Sportsman Association, personnel from the New Jersey Division of Fish, Game and Wildlife, Endangered Species and Nongame Program, the Director of the Cape May Bird Observatory, and leaders of United Bow hunters of New Jersey.

On the evening of March 23, 1993, at the request of the Middle Township Committee, the refuge held a public scoping meeting at the Middle Township Municipal Building. More than 250 people attended the meeting. We received numerous written comments and suggestions in the months following the meeting.

The refuge provided the New Jersey Division of Fish, Game and Wildlife a copy of the Draft Public Use Plan in November 1993. The Division was pleased with the opportunity to review and comment. In the fall of 1993 the refuge staff met with a representative of the New Jersey Commission for the Blind and Visually Impaired for insights on the public use management. In February 1994, copies of the Draft Plan were made available for public review and comment in all eight libraries in the Cape May County Library System, as well as at the refuge office. The refuge received 57 written comments on the Draft Plan.

4. Compliance with Environmental and Cultural Plans

John Wilson and Rick Kanaski of the Regional Office inspected the Kenney house site (Tract 1011) in April 1994 to determine if there were any archeological resources that would be adversely impacted by the construction (parking lot and new driveway) needed to convert the house from a residence to the refuge office. No archeological or historical resources were found.

In March 1994, the refuge submitted to the Regional Office a Compatibility Determination on renewing the lease of the Wireless Aero-sports Pilots Society (WASP) to fly model airplanes on refuge property. The current lease to fly model airplanes transferred with the Service's purchase of the property in September 1992, and expires February 28, 1996. The Assistant Regional Director for Refuges and Wildlife accepted the refuge finding that renewing the lease was incompatible with the purposes for which the refuge was established.

In October 1994, the refuge submitted to the Regional Office a Compatibility Determination, Recreation Act Funding Analysis, Section 7 Consultation, Environmental Assessments, Environmental Action Memoranda, and FONSI for opening the refuge for public hunting of white-tailed deer. In December 1994, the refuge, submitted to the Regional Office a compatibility determination package for opening the refuge to non-consumptive public uses: wildlife/wildlands observation and photography and walking.

5. Research and Investigations

From September 1993 through the end of 1994, refuge staff or volunteers regularly checked on four sets of groundwater monitoring wells (17 wells in all) within the refuge acquisition area for Ralph Tiner of the Region Office. The Information was collected to better correlate vegetation and soil types with ground water hydrology.

E. ADMINISTRATION

1. Personnel

1. Stephen P. Atzert, Refuge Manager (RM), GS-12, PFT, EOD 02/24/91
2. Kelly Wolcott, Assistant Refuge Manager (ARM), GS-11, PFT, EOD 11/04/1991.
Transferred to Refuge Manager position (GS-12) at Guam NWR 07/24/94.
3. Maura J. Sheehan, Assistant Refuge Manager (ARM), GS-09, PFT, EOD 04/03/94
4. Marie Kayati, Office Assistant (OA), GS-5, PFT, EOD 08/09/92

Meetings and Conferences

In April 1993 the RM and ARM Wolcott attended the Northeast Fish and Wildlife Conference in Atlantic City.

In May 1993 the RM attended the Shorebird Workshop hosted by the New Jersey Division of Fish, Game and Wildlife to develop a comprehensive shorebird management plan for the Delaware Bay.

In June 1993 the RM attended a meeting at Ocean County Community College between the New Jersey Division of Fish, Game and Wildlife and the Service. The meeting was to improve coordination between the two agencies.

In June 1993 the RM and ARM Wolcott attended a two-day meeting in Atlantic City with all Service offices in New Jersey. The workshop developed recommendations for action on a set of issues in agency cooperation. Cooperation with State agencies, higher level cooperation on issues of biodiversity and ecosystem management and better coordination on matters of contamination and regional development were discussed.

In June of both 1993 and 1994 refuge staff attended the Waterfowl Coordination meeting hosted by the State Division of Fish, Game and Wildlife.

Training

RM Atzert

Aircraft Safety
Community CPR and First Aid
Law Enforcement Refresher
Compatibility Determination
Total Quality Management
The Role of Supervisor and Manager in EEO
Defensive Driving

ARM Wolcott

Grassland Restoration
Administrative Workshop
Community CPR and First Aid
Law Enforcement Refresher
Total Quality Management
Management, Supervision and Group Performance
Defensive Driving

ARM Sheehan

Coaching Skills for Supervisors
Powerful Communication Skills
Community CPR and First Aid
Managing Multiple Projects and Priorities
Oil Spill Response
Law Enforcement Refresher

OA Kayati

Administrative Workshop
Community CPR and First Aid
Oil Spill Response

4. Volunteer Program

Photo 1: Volunteers Jim Carroll and Jim Fiocca posting Service-owned property.

In January 1993, volunteers helped place five screech owl/kestrel boxes.

In 1993, one Richard Stockton College volunteer/intern designed a study to better characterize the Cape May Lowland Swamp plant community. This is one of the rarest plant communities in the County.

In 1993, three Richard Stockton College volunteer/interns continued ground truthing and habitat type mapping the refuge from color-infra red aerial photographs.

In March 1993, Boy Scouts from Troop 63, Villas, New Jersey, collected 234 tires and debris from Service owned property. Middle Township picked up and disposed of the tires; the refuge covered the tipping fees.

During the Spring of 1993, a volunteer placed four barred owl nest boxes on refuge property. He built and placed the boxes as an Eagle Scout project.

During the Summer of 1993, through our working relationship with the Wetland Institute, a local consulting biologist developed a training program for refuge volunteers. The volunteer surveyed sections of the Delaware Bay Division of the refuge for reptiles and amphibians. ARM Wolcott accompanied the volunteers on a nocturnal survey.

In the Spring of 1994, students from the Cape May County Special Education Unit/Outdoor Experiential Education Program helped clear and planted a "wildlife/butterfly" garden at the Kenney House. A Richard Stockton College student volunteer/intern also helped. This project was funded by a \$3,300 Challenge Grant. A second Richard Stockton College student volunteer/intern cared for the garden the entire summer of 1994.



Photo 2: ARM Kelly Wolcott and special education students of the Cape May County Outdoor Experiential Education Program planting the refuge wildlife garden.

In 1994, Middle Township High School students removed debris from Service-owned property.

In 1994, a volunteer developed a draft refuge exhibit to be displayed at the Cape May Bird Observatory. The exhibit will focus on the Service's efforts to preserve lands in Cape May County for migratory birds. This project was funded by a \$3,200 Challenge Grant.

In January 1994, two volunteer/interns from Richard Stockton College began work on the refuge Comprehensive Public Use Design Plan. This is a step down of the Station Public Use Plan. This project was funded by a \$10,000 Challenge Grant.

Dr. Sandy Bierbrauer, a Richard Stockton College botanist, visited the refuge and offered to help coordinate vegetation surveys, sponsor student interns and act as a consultant.

5. Funding

ARM Wolcott helped develop one challenge grant proposal for FY-93. The refuge assisted in getting Challenge Grant funding (\$10,000) for the Cape May Bird Observatory for a separate breeding bird atlas for the five National Wildlife Refuges in New Jersey; Cape May, Edwin B. Forsythe, Great Swamp, Supawna Meadows, and Wallkill River.

ARM Wolcott helped develop five challenge grant proposals for FY-94. The five projects included three with the Wetlands Institute, one with the County Outdoor Experimental Education Program, and one with a volunteer and the Cape May Bird Observatory. All of the projects have a strong public use component, including a wildlife garden to be designed and constructed by a group of special education students. The Regional Office funded three of the challenge grant proposals: refuge exhibit for \$3,200, comprehensive Public Use Design for \$10,000 and wildlife garden for \$3,300.

Fiscal Year/ Refuge Operations Funds	1990	1991	1992	1993	1994
1261	0	\$62,300	\$125,560	\$153,283	\$153,583
1262	0	0	\$59,470	\$25,200	\$25,500
8451	0	0	0	0	0
9120	0	0	0	0	0
Totals	0	\$62,300	\$185,030	\$178,483	\$179,083

TABLE 2. Operations funding level by major program.

Fiscal Year	Dennis Township	Middle Township	Upper Township	Totals
1989	\$00.00	\$2,952	\$2,628	\$5,580
1990	\$2,803	\$3,973	\$14,726	\$21,502
1991	\$10,018	\$21,701	\$16,829	\$48,548
1992	\$10,857	\$34,092	\$17,306	\$62,255
1993	\$10,355	\$37,062	\$16,654	\$64,071

Table 3: Actual Revenue Sharing Payments by Township

Refuge revenue sharing payments are authorized by the Refuge Revenue Sharing Act of 1935 (16 U.S.C. 715s; 49 Stat. 383), as amended. These payments to local governments are in lieu of taxes. The Act authorizes appropriations to make up deficiencies if there are insufficient refuge receipts in the fund to make full payments to the local governments. If insufficient funds for full payment are not available, payments are pro-rated over all eligible areas on a national basis.

For the first three fiscal years that the refuge existed (1989, 1990 and 1991), refuge revenue sharing payments were 78 percent, 93.5 percent, and 89.5 percent of full payment, respectively. The Fiscal Year 1992 and Fiscal Year 1993 revenue sharing payments were 81.1 percent and 77.1 percent of full payment, respectively.

Refuge revenue sharing payments are based on the value of the Service-owned property at the end of a given fiscal year. The actual payments are made the following spring. Full payment is based on \$0.75 per \$100 of appraised fair market value (0.75 percent). The appraised value the first five years after Service acquisition is the value at settlement. Thereafter, the Service reappraises the properties every five years.

6. Safety

The refuge staff and volunteers watched safety videos on the use of respirators and disease transmission. A refuge vehicle was equipped with police lights for added visibility and safety during LE patrols.

7. Technical Assistance

In February 1993, the refuge sent copies of the Station Management Plan and the New Jersey Natural Heritage Program Report "Best Remaining Natural Communities and Rare Species Sites of New Jersey's Cape May Peninsula" to the 16 local governments and the County Planning Board. The purpose was to keep all the local governments apprised of our plans and to give them information that they could use in their own planning decisions.

In 1994 the refuge sent copies of "Saving America's Countryside--A Guide to Rural Conservation" to Middle, Dennis and Upper Townships and the County Planning Board. The refuge also sent copies of

"Wetland Policy Issues" by the Council for Agricultural Science and Technology to the 16 municipalities in the County and the County Planning Board.

In October 1993, Associate Manager Frickie, Ascertainment Chief Quist and RM Atzert visited the 5,000-acre Glade Preserve in Cumberland County, New Jersey, which is owned and managed by the Natural Lands Trust, a non-governmental entity, with headquarters in Pennsylvania. The Trust wanted the Service to manage the property. Due to the minimal staff at the refuge, the Service declined and suggested that the Trust approach the Service's New Jersey Field Office for Partners for Wildlife funding.

In March 1993, ARM Wolcott attended the Ecological Services Biologists Conference in Princeton, New Jersey, and made a presentation on the process of ecosystem management and planning.

Cape May County Mosquito Control Commission Superintendent advised the RM that the Commission will propose removing the water control structures partially regulating the water levels in the Lower Green Creek drainage in the Delaware Bay Division of the refuge. This project would restore tidal flow to about 500 acres of the Green Creek marsh, which is currently choked by phragmites. The refuge supported this proposal. ARM Sheehan and New Jersey Field Office Biologist Hafner subsequently met with the Cape May County Mosquito Commission Superintendent to develop funding sources for the Lower Green Creek Marsh Restoration Project. The project received \$15,000 in Partners for Wildlife funding.

ARM Wolcott presented the refuges point of view at New Jersey's first Partners in Flight meeting. The meeting established directions for research, management, education and policy for the conservation of neotropical migrants in New Jersey.

The refuge provided information to the Corps of Engineers concerning biological values of the Cape May Point area. The Corps is devising a cleanup program for the Naval Reservation.

The refuge participated in the NJ Division of Fish, Game and Wildlife, Endangered and Nongame Species Program Landscape Project. The mission of the project is to ensure the long-term preservation of animal biodiversity.

In February 1994, the refuge sent information on Right-of-Way management techniques used at the Patuxent Wildlife Research Center (PWRC) to the Atlantic Electric Company. The PWRC techniques resulted in a managed shrub community that is rich in botanical diversity and is heavily used by wildlife. The refuge asked Atlantic Electric to consider using the method on the 14 miles of power line within the approved refuge acquisition boundary.

In February 1994, ARM Wolcott was detailed to the PWRC to help finalize a Refuge Research Needs Assessment for the National Biological Survey.

The RM advised the Cape May County Open Space Board that the Service was interested in a joint venture to acquire property in the Fishing Creek Unit of the Delaware Bay Division.

The RM submitted a letter of support to the National Science Foundation for a "Research Experience for Undergraduates" proposal developed by the Wetlands Institute Director of Research, Dr. Roger Wood.

ARM Wolcott met with Wetlands Institute representatives to develop a grant for a volunteer training program. The grant would develop a common training program for environmental education organization in the area. It would serve to focus educational interest toward the Delaware Bay and its resources.

ARM Wolcott met with Leamings Run Gardens owner to discuss annual flowers and gardens. They are interested in focusing attention on native plant communities as a means of improving their plant education.

Refuge staff met with Ecological Services representatives and members of the Cape May County Parks Commission to review information and ideas related to the County's ban on hunting in the Cape May County Refuge.

During the Winter of 1993/94, the refuge loaned copies of the video: "Vanishing Lands" to the Wetland Institute, the County Extension Office, the Cape May City Nature Center, and the Borough of Wildwood Planning Board. Refuge staff also showed the video to numerous groups: the Egg Harbor Township Environmental Commission, the Middle Township Environmental Commission, the Cape May County Beach, Inlet and Bay Stabilization Commission, the Ocean City Beach Commission, and the Wildwood Crest Environmental Commission. The video outlines the impact of land subsidence and sea level rise on coastal communities and recommends plans of action.

The refuge distributed information on the New York Audubon Society's Cooperative Sanctuary Program for Golf Courses to six area golf courses.

ARM Sheehan was an active member of the a Shorebird Management Public Outreach Team from the summer of 1993 until her resignation in October 1995. The team was an outgrowth of the Comprehensive Shorebird Management Plan for the Delaware Bay.

The RM and OA Kayati captured an injured red-tailed hawk in Rio Grande, New Jersey. The hawk was taken to the Avian Rehabilitation Center in Marmora for examination and treatment. After four months of rehabilitation the hawk was released in Marmora.

OA Kayati responded to a call from Harrah's Casino in Atlantic City concerning newly hatched mallard ducklings on Harrah's valet parking lot. The OA captured the mother and seven ducklings and transported them to a marsh in Absecon, near the E.B. Forsythe Refuge. One duckling remained on shore and was taken to the Avian Rehabilitation Center in Marmora.

OA Kayati arranged a meeting between ARM Wolcott and Betty McCarron of the Avian Rehabilitation Center in Marmora. The refuge refers all injured bird callers to the Center. The meeting reviewed the status of the Center and possible cooperative projects. The Center's leased-facility was for sale and it was looking for a new site to relocate. Unfortunately, the Center could not find a suitable location, therefore it ceased operation in April 1994.

8. Other

In July 1993, Peter Allen and Carol Ann Flood , Region Contracting and General Services, visited the refuge to review contracting and purchasing procedures, and record keeping. A complete administrative inspection determined our records are in excellent shape and prepared in accordance with Director's Orders.

Assistant Associate Manager Refuges North, Stan Skutek, Outdoor Recreation Planner, Thomas Comish, Central Zone Biologist, Charlie Pelizza, and Budget Specialist, Christal Cutler, conducted a Station Evaluation during the week of January 10-14, 1994.

With the initiation of Ecosystem Management by the Service in 1994, the Cape May NWR was assigned to both the Delaware River/Delmarva Coastal watershed and the Hudson River/New York Bight watershed. Five of the watershed within the refuge empty into the Delaware Bay, the other empties into the New York Bight.

On July 1, 1994, this refuge, along with the other refuges in New Jersey, was transferred from Refuges North to Refuges South. The move was made to even out the workload of the two Associate Managers in the Regional Office.

On October 1, 1994 the RM began a part-time position as Acting Manager of the Edwin B. Forsythe National Wildlife Refuge--essentially three days a week were spent at Forsythe and the remainder at Cape May.

F. HABITAT MANAGEMENT

1. General

A refuge habitat inventory database was developed. All refuge areas are mapped and ground-truthing has been accomplished for two of the refuge's 14 units. We need to continue ground-truthing, adequately map and digitize the habitat types, and evaluate the patterns of habitat occurrence on the refuge. Stockton College students began the habitat inventory work.

8. Haying

Under a Special Use Permit, the former owner of Tract 360 cuts hay on about 21 acres of grasslands in that tract. He also mows the multiflora rose along the edge of the grassland to help keep it under control.

10. Pest Control

During 1993 and 1994 the refuge continued to cooperate with the New Jersey Division of Fish, Game and Wildlife in testing *Vaccinia-rabies* glycoprotein baits to prevent raccoon rabies epizootic from spreading to the Cape May Peninsula. The testing began in the Spring of 1992. The refuge issued Special Use Permits to the State allowing distribution of *Vaccinia-rabies* glycoprotein bait on Service owned property within the rabies buffer zone across the northern part of the County. Towards the end of 1994 the rabies did breach the buffer zone although the buffer zone did slow the advance of the rabies epizootic. Once the disease spread into the unprotected raccoon population south of the buffer, the rate of disease spread rapidly compared to the rate of spread in the raccoon population inside the buffer. The Director of the study believes that the buffer needed to be wider.

The refuge issued a Special Use Permit to the Cape May County Mosquito Control Commission in 1993 and 1994 to treat mosquito larvae with Abate 2-CG on 12 acres of spartina marsh and 85 acres of phragmites within the refuge. The phragmites marsh is targeted for restoration area to tidal flow by removing old water control structures. The refuge issued a Special Use Permit to the Cape May County Mosquito Control Commission in 1993 and 1994 to spray 75 acres of upland woods and fields to control adult mosquitos.

The refuge issued a Special Use Permit to Middle Township in 1993 to spray *Bacillus thuringiensis* on designated refuge lands near residential areas to control gypsy moth larvae.

G. WILDLIFE

2. Endangered and/or Threatened Species

There are currently twenty-seven avian species and six reptile or amphibian species listed by the State of New Jersey as endangered or threatened, that are found in the County habitat similar to that available on the refuge. Two Federally-listed avian species use the refuge area: bald eagle and peregrine falcon. In addition, there are fifty-three State-listed endangered or threatened plants, one Federally-listed threatened plant species (swamp pink), plus three Federal candidate plant species, that are found in the County in habitat similar to that available on the refuge.

3. Waterfowl

Seven species of waterfowl of management concern the refuge.

4. Marsh and Water Birds

Thirteen species of marsh and water birds of management concern use the refuge.

5. Shorebirds, Gulls, Terns and Allied Species

The spectacular spring horseshoe crab egg-laying season attracts hundreds of thousands of shorebirds to the Delaware Bay to put on fat deposits for spring breeding. Although red knots, sanderlings, semipalmated sandpipers and ruddy turnstones are the most common, large numbers of short-billed dowitchers, dunlin, semipalmated plovers and black-bellied plovers are also found feeding. Estimates for the overall migration on the Delaware Bay reach as high as one-and-a-half million individuals. Although the shorebirds may be feeding voraciously on the low-calorie crab eggs, supplemental feeding on marsh and beach areas may be vital for gaining the necessary fat reserves to be successful in breeding.

Woodcock also occur extensively within the approved refuge acquisition boundary. Several areas have already been identified as suitable for woodcock habitat improvement projects. Although woodcock are known to concentrate in the area during migration, we believe that birds may breed in the area much more extensively than was once thought.

6. Raptors

Birders around the world know Cape May for its spectacular raptor migration in the fall. In a single October day, an observer at Cape May Point might be able to see 100 Peregrine Falcons, 200 Osprey, 150 Northern Harriers, and 7,000 American Kestrel. Recent studies have indicated that although avian predators such as the Cooper's and sharp-shinned hawk concentrate at Cape May Point, where passerines also concentrate, other species may distribute themselves more evenly through the peninsula. Even sharp-shinned hawks appear to concentrate in other areas, including areas within the designated refuge boundary. Thirteen of the 100 avian species of management concern are nocturnal or diurnal raptors.



Photo 3: by Clay Meyers of Fish-eating Osprey

7. Other Migratory Birds

Of the 317 species found in the area, 151 or 48% are considered migratory birds that do not fall into one of the four narrative categories of birds: waterfowl, marsh and water birds, raptors, and shorebirds, gulls, terns and allied species. Two groups of especially strong interest are the neotropical migrants and the area-sensitive, forest-interior nesting birds. Of the 317 birds found in Cape May County, 219 can be considered neotropical migrants to some degree or another. Of those 219, 101 neotropical migrants breed locally (or 74% of the total breeding species). Twenty-one locally occurring species are considered area-sensitive, forest-interior nesting species; 19 of those breed in the area. Fifty-six of the 100 avian species of management concern fall under this category.

8. Game Animals

Many of the refuge areas have traditionally been hunted. The Cape May area is well known for excellent woodcock hunting opportunities and there is a good population of white-tailed deer.

H. PUBLIC USE

1. General

ARM Wolcott made a presentation to members of the South Jersey group of the New Jersey Sierra Club. The group is interested in non-consumptive public use.

ARM Wolcott made a presentation to members of the New Jersey Animal Rights Alliance concerning refuge management.

The RM toured State owned Higbee Beach Wildlife Management Area with the area manager, Eric Stiles, to see how the State manages field habitats and public use in that endangered species management area.

2. Outdoor Classrooms - Students

ARM Wolcott presented an overview of refuge planning and development to biology students at Stockton State College.

6. Interpretive Exhibits/Demonstrations

In 1993, ARM Wolcott represented the refuge and Ecological Services at a local "National Night Out" Fair. He displayed a table top exhibit on refuges and endangered species. In 1994, ARM Sheehan represented the refuge at the National Night Out Celebration.

Each year the refuge set up exhibits for the two-day Wetlands Institute Wings & Water Festival.

11. Wildlife Observation

Scores of birders flock to the area during the bird migratory season. Interested birders call the refuge for maps and information concerning infrastructures and wildlife material. Approximately 100 information packets were mailed out each year.

12. Other Wildlife Oriented Recreation

The RM attended the first shorebirds meeting hosted by the New Jersey Division of Fish, Game and Wildlife Non-Game section. Discussions were held on major issues related to the management of shorebirds on the Delaware Bay. Presentations included basic biology, human use and disturbance, and management issues. Work groups were established for protection, emergency response, strategic planning and public outreach.

17. Law Enforcement

In both 1993 and 1994 several illegal deer-stands were discovered on refuge property and dismantled. Tract 10c has consistently been one of the refuge areas with the most interest by local hunters.

I. EQUIPMENT AND FACILITIES

2. Rehabilitation

In 1994, the underground fuel storage tank at the Gamble house property was removed by contracted services. The tank had been used to fuel a school bus owned by the previous landowners.

4. Equipment Utilization and Replacement

Equipment, vehicles and office furniture is in good working condition. All property is maintained in accordance with manufacturers' suggestions.

6. Computer Systems

Each staff member has access to a computer. Only one printer is available, but this presents no problems.

8. Other

OA Kayati has authorization from Region 5 Property Officer to screen and remove property from Lakehurst Naval Base. This has resulted in acquiring substantial excess property for the refuge and no cost.

J. OTHER ITEMS

1. Cooperative Programs

The Wetlands Institute Director agreed to present a Cooperative Agreement to the Institute Board which would commit the Wetlands to management and maintenance responsibility of the Gamble House. The Wetlands Institute provides housing for volunteers during the summer months while they are completing research on refuge property.

The Gamble House opened for volunteers in the summer of 1993. They are supervised by Wetlands Institute personnel. Five volunteers are tested diamond-backed terrapin excluder devices on Dias Creek. In March 1994, the refuge staffs of Cape May NWR and Forsythe NWR met with representatives of The State Mosquito Control Commission and County mosquito control agencies of Atlantic, Burlington, Cape May and Ocean Counties to develop and MOU concerning salt water mosquito control on National Wildlife Refuges in New Jersey; Cape May and Forsythe. The MOU was signed by the Region and the State during the summer of 1994.

In 1993, a local resident donated to the refuge artifacts which he had found along Kimbles Beach. In contacts with a local archeologist, who formerly taught at Richard Stockton College, we learned that some of the artifacts date back to 10,000 BC. During 1994, personnel from the Department of Science and Math at Stockton College, and representative of the Department of Archeology at Rutgers University visited the archeological site near Kimbles Beach. They want to start a joint Rutgers/Stockton College archeological project at the site. According to these experts, the site is possibly one of the best paleo-indian archeological sites in New Jersey. Geologists from the New Jersey Geological Survey tested ground-penetrating radar at the archeological site in an attempt to map its extent.



Photo 4: Pictured left to right: Rachel Husted, Marie Kayati, Maura Sheehan, Congressman Weldon, Steve Atzert and Kelly Wolcott

3. Items of Interest

In July 1994, Congressman Curt Weldon, Pennsylvania 7th District and member of the Migratory Bird Conservation Commission, and his family visited the refuge and met the entire refuge staff. The RM provided a tour of Reeds Beach, Kimbles Beach, and surrounding property.

The RM and ARM Wolcott met with Dr. Sam Pursglove of the ruffed Grouse Society to orient Dr. Pursglove to Cape May NWR resources and resource planning. He was interested in funding and looking for methods by which the Society could help develop alternative funding for land acquisition and habitat management. The RM and ARM Wolcott subsequently met with Ruffed Grouse Society biologist, Dan Dessecker, to discuss funding and habitat improvement projects. ARM Wolcott initiated the contacts with the Ruffed Grouse Society.

ARM Wolcott completed an article for the Cape May Bird Observatory magazine "The Peregrine Observer". The article highlighted the history of the refuge, including the initial interest in upland game birds, and emphasized the diversity of the Cape May area.

ARM Wolcott was the keynote speaker at the Cape May Bird Observatory Spring Weekend in 1993. Over 400 people attended.

At the request of the Dennis Township Committee the RM discussed a proposal to exchange Service-owned land for township-owned property for the township to create a ball field and recreation area. The township subsequently selected another site.

The Delaware Bay Ferry Authority is considering major interpretive facilities at its two terminals: Lewes, Delaware, and North Cape May, NJ. The Authority has hired a consulting firm to generate a proposal. The RM met with two consultants working on the project in 1993.

In 1993 the refuge sent Congressman Hughes an extensive U.S. Geological Survey report that projects the groundwater situation in Cape May County to the year 2049 under five different scenarios. We are concerned that there could be wetland losses within the approved refuge acquisition boundary due to increased groundwater withdrawals.

In September 1993, Middle Township Mayor Voll sent Senator Lautenberg a letter requesting \$2 million to be included in the FY-94 land acquisition budget for the Cape May NWR. He stressed the importance of the refuge to migrating birds and highlighted the eco-tourism in the area. The final legislation contained \$2.1 million in the Land and Water Conservation Fund for this refuge.

4. Credits

The annual narrative was written by Refuge Manager Steve Atzert, Assistant Refuge Manager Maura Sheehan, and Office Assistant Marie Kayati.

K. FEEDBACK

If we intend to increase our customer interest it is necessary to relate our role in the environment through out-reach programs. Not only do we need to focus on wildlife resource, but expand our role in the community as protectors of wildlife and habitat for the benefit of the people, both tourists and residents.

APPENDICES

- Appendix 1a: Climatological Data for Cape May City, 1993 and 1994
- Appendix 1b: Climatological Data for Belleplain State Forest, 1993 and 1994
- Appendix 2: Summary of land acquisition activities during the first four fiscal years of the refuge (1989 through 1992).
- Appendix 3: Breakdown by township of land acquisition funds expended by fund source during the first four fiscal years of the refuge (1989 through 1992). MBCA=Migratory Bird Conservation Account, LWCF=Land and Water Conservation Fund.
- Appendix 4: Breakdown of acres acquired by township during the first four fiscal years of the refuge (1989 through 1992).
- Appendix 5: Breakdown of funds expended by township during the first four fiscal years of the refuge (1989 through 1992).
- Appendix 6: Tract details of lands acquired during the period October 1, 1992 through December 31, 1994.
- Appendix 7: Ownership and township details of tracts purchased during the period October 1, 1992 through December 31, 1994.
- Appendix 8: Natural Community Types at the Cape May NWR
- Appendix 9: Birds of Management Concern at the Cape May NWR

Appendix 1a: 1993 Climatological Data for Cape May City

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average or total
1993 Monthly Maximum Temp	61	54	59	72	85	95	99	73	91	75	78	58	75
1993 Monthly Minimum Temp	22	15	18	32.1	43	52	62	65	47	37	29	11	36
1993 Monthly Average Temp	39	32.5	38	52	62	73	80	69	69	56	48	34	54
Departure from Normal Temp	+2	-2.07	-4.3	+1.3	+1.7	+3.6	+5.0	+6	+5	-2.3	-.8	-3.4	+1.8
1993 Precipitation in inches	3.56	2.24	7.15	2.83	3.6	1.09	3.98	1.49	2.05	6.48	1.80	5.06	41.3
Departure from normal in inches	+0.1	-0.9	+3.3	-.61	+.1	-2.14	-2.31	-.95	+3.5	-1.4	+.02	+1.5	+1.3
1993 Snow in inches	T	6.1	5.2	0	0	0	0	0	0	0	0	3.8	15.1

Source: Monthly Station Normals of Temperature, Precipitation and Heating and Cooling Degree Days, 1961-1990, NOAA

Appendix 1a: 1994 Climatological Data for Cape May City

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average or Total Amount
1994 Monthly Maximum Temp	55	69	76	89	91	95	104	90	91	79	75	66	Average: 82
1994 Monthly Minimum Temp	-5	8	13	27	32	42	63	49	41	30	25	13	Average: 28
1994 Monthly Average Temp	40	44	55	72	75	86	90	82	80	69	64	35	Average: 66
Departure From Normal Temp	+6.7	+9.5	+12	+16	+11	+16	+15	+4.8	+11	+10	+6.8	-2.4	Total: +7.02
1994 Precipitation in Inches	3.96	4.43	9.19	2.81	3.53	.92	5.35	4.32	5.10	1.32	3.33	2.32	Average: 3.88 Total: 46.58
Departure From Normal in Inches	+.49	+1.3	+5.8	+.38	+.53	-2.3	+1.5	+1.0	+1.9	-1.73	+.11	-1.2	Total: +.65
1994 Snowfall in Inches	0	0	0	0	0	0	0	0	0	0	0	0	Total: 0

Source: Monthly Station Normals of Temperature, Precipitation and Heating and Cooling Degree Days, 1961-1994, NOAA

Appendix 1b: 1993 Climatological Data for Belleplain State Forest

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave or total
1993 Monthly Max (F)	67	64	66	85	94	90	95	94	87	76	75	63	79.7
1993 Monthly Min (F)	4	12	16	25	27	47	50	48	34	31	19	10	26.9
1993 Monthly Average (F)	36.6	37.9	40.7	51.6	59.7	68.4	75.7	72.0	67.8	54.4	47.7	37.5	52.1
Departure from norm(F)	+5.2	+4.8	-1.28	-1.05	-.92	-.62	+1.6	-.71	+2.0	-.64	+2.0	+1.3	+1.
1993 Prec in inches	1.63	3.16	3.48	1.82	3.87	2.78	3.12	7.23	5.45	1.10	3.54	3.74	40.9
Departure from norm(in)	-1.78	+.06	-.05	-1.86	+.33	-.35	-.55	+2.6	+2.1	-2.3	+.18	+.29	-1.3
1993 Snow inches	0.5	0	0	0	0	0	0	0	0	0	0	0	.05

Source: Monthly Station Normals of Temperature, Precipitation and Heating and Cooling Degree Days, 1961-1990, NOAA

Appendix 1b: 1994 Climatological Data for Belleplain State Forest

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average or Total Amount
1994 Monthly Maximum Temp	53	63	74	86	85	89	90	89	82	79	73	63	Average: 77
1994 Monthly Minimum Temp	-1	15	24	35	38	52	63	51	51	35	32	19	Average: 38
1994 Monthly Average Temp	26	39	49	61	62	71	77	70	67	57	53	41	Average: 58
Departure From Normal Temp	-7.3	+4.5	+6.8	+5.0	-1.3	+1.6	+2.0	-4.4	-1.5	-1.3	+4.2	+3.6	Total: +.99
1994 Precipitation in Inches	4.23	4.43	2.16	1.05	3.5	3.73	5.01	3.72	4.14	1.30	3.44	1.6	Average: 3.19 Total: 38.31
Departure From Normal in Inches	+.76	+1.3	-1.71	-1.38	+.5	+.5	+1.2	+.42	+1.1	-1.75	+.22	-2.0	Total: +.12
1994 Snowfall in Inches	1.5	0.4	1.45	0	0	0	0	0	0	0	0	0	Total: 3.35

Source: Monthly Station Normals of Temperature, Precipitation and Heating and Cooling Degree Days, 1961-1994, NOAA

Appendix 2: Summary of land acquisition activities during the first four fiscal years of the refuge (1989 through 1992). (October 1, 1987 through September 30, 1992).

	Acres	Acres	Dollars	Dollars
Fiscal Year	Annual	Cumulative	Annual	Cumulative
1989	886.02	886.02	\$ 955,000.00	\$ 955,000.00
1990	1,701.45	2,587.47	\$2,109,632.87	\$ 3,064,632.87
1991	2,226.12	4,813.59	\$4,162,687.63	\$ 7,227,320.50
1992	873.91	5,687.50	\$2,938,512.00	\$10,165,832.50

Appendix 3: Breakdown of land acquisition funds expended by fund source during the first four fiscal years of the refuge (1989 through 1992). MBCA=Migratory Bird Conservation Account, LWCF=Land and Water Conservation Fund.

Fiscal Year	MBCA	LWCF	Total
1989	\$ 45,000.00	\$ 910,000.00	\$ 955,000.00
1990	\$1,310,000.00	\$ 799,132.87	\$2,109,132.87
1991	\$ 342,200.00	\$3,820,487.63	\$4,162,687.63
1992	\$ 459,500.00	\$8,479,012.00	\$2,938,512.00

Appendix 4: Breakdown of acres acquired by township during the first four fiscal years of the refuge (1989 through 1992).

	Middle Township	Dennis Township	Upper Township	Total
Fiscal Year	Acres	Acres	Acres	
1989	455.34	00	430.68	886.02
1990	80.00	316.10	1,305.35	1,701.45
1991	957.27	936.25	332.33	2,225.85
1992	360.27	256.43	257.20	873.90
Total Acreage	1,852.88	1,508.78	2,325.56	5,687.22

Appendix 5: Breakdown of funds expended by township during the first four fiscal years of the refuge (1989 through 1992).

Year	Middle Township	Dennis Township	Upper Township
	Dollar Amount	Dollar Amount	Dollar Amount
1989	\$ 505,500.00	\$ 00	\$ 450,000.00
1990	\$ 60,000.00	\$ 399,470.43	\$1,648,862.44
1991	\$2,664,300.00	\$1,092,020.50	\$ 406,367.13
1992	\$2,336,448.00	\$ 281,400.00	\$ 320,664.00
Total Dollar Amount per Township	\$5,567,048.00	\$1,772,890.93	\$2,825,893.57

Appendix 6: Tract details of lands acquired during the period October 1, 1992 through December 31, 1994.

<u>Date</u>	<u>Tract</u>	<u>Div.</u>	<u>Acres</u>	<u>Cost</u>	<u>Funding Source</u>
11/04/92	348a	db	17.10	\$ 8,550.00	MBCA
12/14/92	360	db	82.33	478,161.00	LWCF
01/20/93	1002I	db	13.83	81,000.00	LWCF
01/20/93	376-I	db	28.30	100,000.00	LWCF
01/22/93	4h	db	36.3	20,000.00	MBCA
04/15/93	1000	gc	24.11	25,500.00	LWCF
08/26/93	1011	db	.92	91,000.00	LWCF
12/14/93	189	db	40.95	123,000.00	LWCF
12/17/93	1012	db	75.25	385,879.00	LWCF
04/06/94	289	db	6.68	4,500.00	LWCF
06/15/94	148a	db	26.32	100,000.00	LWCF
06/16/94	793	gc	00.00 ii	5,000.00	LWCF
07/26/94	348	db	39.50	106,900.00	LWCF
08/15/94	345-I	db	132.83	523,300.00	LWCF
08/18/94	376-I	db	(.82)	Exchange	
08/18/94	295b	db	5.13	244.00	LWCF
12/19/94	1007	db	9.96	164,000.00	LWCF
12/19/94	1007	db	48.50	27,300.00	MBCC
12/19/94	200	db	147.57	582,000.00	LWCF
TOTALS			734.76	\$2,826,334.00	

ii - This transaction was for the remaining 50 percent undivided interest in this property. The acreage (2.44 acres) was added to the refuge total at the time the original 50 percent undivided interest was acquired - 8/22/91.

Appendix 7: Ownership and township details of tracts purchased during the period January 1, 1993 through December 31, 1994.

Date - Owner	Tract	Township	Block	Lot	Acres
1/20/93 NatWest Bank	1002-I	Middle	165	24.16	13.83
1/20/93 Harris	376-I-II	Middle	167.01	58	28.30
1/22/93 Middle Twp	4h	Middle	142	4.01	38.30
4/15/93 Germanio	1000	Upper	453	239	24.11
8/26/93 Kenney	1011	Middle	43	7.16	00.92
12/14/93 Otten	189	Middle	56.01	18.02	40.95
12/17/93 Stocker	1012	Middle	473	29-33	75.25
4/06/94 Van Meter	289	Middle	167.01	7	6.68
6/15/94 Bay Shore	148a	Middle	48	4.01	26.32
6/16/94 Aesop, Inc	793	Dennis	120	27	2.44
7/26/94 McClain	348	Middle	388	28	39.50
8/15/94 Sheets	345-I	Middle	388	31.01	132.83
8/18/94 Harris	376-I	Middle	167.01	58	.82
8/18/94 Lanciano	295b	Middle	167.01	50.02	5.13
12/19/94 Rohanna	1007	Middle	43	7.09	9.96

<u>Date - Owner</u>	<u>Tract</u>	<u>Township</u>	<u>Block</u>	<u>Lot</u>	<u>Acres</u>
12/19/94 Rohanna	1007	Middle	43	7.09	48.50
12/19/94 Verity	200	Middle	163.01	30.07	147.57

Appendix 8: List of Natural Community Types believed to be found on the Cape May National Wildlife Refuge (types according to Tom Bredan, NJ Natural Heritage Program).

	Forested	Non-Forested
Upland	<p>TERRESTRIAL/CLOSED CANOPY</p> <p>Virginia Pine-Oak Forest VPOF</p> <p>Mesic Coastal Plain Mixed Oak Forest MO</p> <p>Southern Coastal Plain Mixed Oak Forest MOSH</p> <p>Mesic Coastal Plain Pine-Oak-Maple Forest MP</p> <p>Dry Pine-Oak Forest DPO</p> <p>Dry Oak-Pine Forests DOP</p> <p>Successional Old Field Scrub/Forest OFS/F</p> <p>TERRESTRIAL/OPEN CANOPY</p> <p>Coastal Dune Woodland CDW</p>	<p>TERRESTRIAL/OPEN CANOPY</p> <p>Coastal Dune Grass Community CDGC</p>

Wetland	<p>WETLAND/TIDAL</p> <p>Freshwater Tidal Swamp FTS</p> <p>WETLAND/NONTIDAL</p> <p>Cape May Lowland Swamp CML</p> <p>Pitch Pine Lowland Forest PPL</p> <p>Pine Barren Hardwood Swamp PHS</p> <p>Coastal Plain Atlantic White Cedar Swamp CS</p> <p>Hardwood-Atlantic White Cedar Swamp HCS</p> <p>Liquidambar-Acer Swamp LAS</p>	<p>PALUSTRINE/OPENCANOPY/NON-TIDAL</p> <p>Coastal Interdunal Marsh CIMA</p> <p>Coastal Plain Intermittent Pond CPIP</p> <p>Pine Barren Shrub Swamp PBSS</p> <p>Robust Emergent Marsh RESw</p> <p>PALUSTRINE/OPENCANOPY/TIDAL/FRESHWATER-OLIGOHALINE</p> <p>Freshwater Tidal Marsh Complex FTMC</p> <p>INTERTIDAL BRACKISH</p> <p>Brackish Tidal Marsh Complex BTMC</p> <p>INTERTIDAL SALINE</p> <p>Salt Marsh Complex SMCo</p>
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Appendix 9: Cape May National Wildlife Refuge - Birds of Management Concern

BB = Breeding in Area; NM = Neotropical Migrant - 1: Wintering primarily in tropics, 2: wintering in southern U.S. and in Tropics, Y: non-categorized neotropical migrant; CM = Management Species; ARS = Area Sensitive Species; FSt = Federal Endangered and Threatened status; State Endangered and Threatened Status; Habitat Use = Preferred Habitat

NAME	BB	NM	CM	ARS	FSt	SSt	Habitat	Use
Pied-billed Grebe	n	y	M	n		En	fwt	
Horned Grebe	n	n	M	n			cst;lks	
Red-necked Grebe	n	n	M	n			cst;lks	
American Bittern	n	y	M	n		Th	fwt;swt	
Least Bittern	Y	y	M	n			fwt;swt	
Great Blue Heron	Y	y	M	n		Th	fwt;swt	
Little Blue Heron	Y	y	M	n			swt	
Green-backed Heron	Y	y	M	n			fwt;swt	
Black-crowned Night Heron	Y	y	M	n			swt	
Yellow-crowned Night Heron	Y	y	M	n		Th	swt	
American Black Duck	Y	n	M	n			fwt;swt	
Wood Duck	Y	y	M	n			fwt	
Green-winged Teal	n	n	M	n			fwt;swt	
Northern Pintail	n	y	M	n			fwt;swt;lks	
Hooded Merganser	n	y	M	n			fwt;lks	
Osprey	Y	n	M	n		Th	swt;cst;lks;rvr	
Bald Eagle	n	n	M	n	En	En	swt;fwt;cst;nrv	
Northern Harrier	Y	2	M	n		En	swt;fwt;fld	
Sharp-shinned Hawk	n	2	M	n			for	
Cooper's Hawk	n	2	M	n		En	for	
Northern Goshawk	n	2	M	n		Th	for	
Red-shouldered Hawk	Y	2	M	y		Th	for;fwt	
American Kestrel	Y	2	M	n			mxu;fld	
Merlin	n	1	M	n			swt;cst	
Peregrine Falcon	Y	1	M	n	En	En	swt	
Ruffed Grouse	Y	n	M	n			for	
Northern Bobwhite	Y	n	M	n			fld;thc	
Black Rail	Y	y	M	n		Th	swt	
Clapper Rail	Y	n	M	n			swt	
King Rail	Y	y	M	n			fwt	
Virginia Rail	Y	y	M	n			fwt	
Sora	n	y	M	n			fwt	
Piping Plover	Y	y	M	n	En	En	bch	
American Avocet	n	y	M	n			swt	
Upland sandpiper	n	1	M	n		En	fld	
Hudsonian Godwit	n	y	M	n			swt	
Marbled Godwit	n	y	M	n			swt	
Ruddy Turnstone	n	y	M	n			bch;swt	
Red Knot	n	y	M	n			bch;swt	
Sanderling	n	y	M	n			bch	
Semipalmated Sandpiper	n	y	M	n			swt	
Baird's Sandpiper	n	y	M	n			fld;swt	
American Woodcock	Y	n	M	n			fwt	

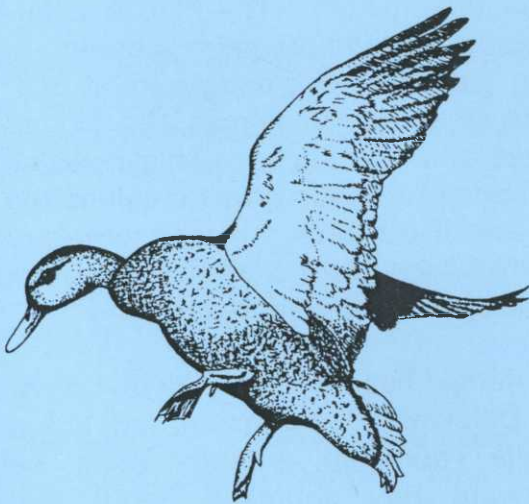
Least Tern	Y	y	M	n		En	bch;cst
Black-billed Cuckoo	Y	1	M	n			for;fed
Yellow-billed Cuckoo	Y	1	M	y			for;fed;Mgs
Common Barn Owl	Y	n	M	n			fld;frm
Barred Owl	Y	n	M	n		Th	for;fwt;Mgs
Long-eared Owl	n	2	M	n			mxu;cof
Short-eared Owl	n	2	M	n		Th	fld;swt;fwt
Common Nighthawk	n	1	M	n			mxu
Whip-poor-will	Y	1	M	y			for
Ruby-throated Hummingbird	Y	1	M	y			mxu
Red-headed Woodpecker	Y	n	M	n		Th	for
Hairy Woodpecker	Y	n	M	n			for;Mgs
Olive-sided Flycatcher	n	y	M	n			for;fed;fwt
Eastern Wood Peewee	Y	1	M	n			for

NAME	BB	NM	CM	ARS	FSt	SSt	Habitat	Use
Acadian Flycatcher	Y	1	M	n			for;Awc	
Least Flycatcher	n	1	M	n			for	
Eastern Phoebe	Y	2	M	n			for;fed;nrv	
Great-crested Flycatcher	Y	y	M	y			for	
Eastern Kingbird	Y	1	M	n			mxu	
Horned Lark	Y	2	M	n			fld	
Purple Martin	Y	1	M	n			fwt;swt;mxu	
Cliff Swallow	n	1	M	n		En	fwt;fld	
Sedge Wren	Y	2	M	n		En	fwt;swt	
Marsh Wren	Y	2	M	n			swt;fwt	
Eastern Bluebird	Y	2	M	n			mxu	
Veery	n	1	M	y			for	
Wood Thrush	Y	1	M	y			for	
Grey Catbird	Y	1	M	n			fed;ofd;Awc	
Brown Thrasher	Y	n	M	n			ofd;fed;hdr	
Loggerhead Shrike	n	2	M	n		En	mxu	
White-eyed Vireo	Y	1	M	n			ofd;fed	
Yellow-throated Vireo	Y	1	M	y			for	
Warbling Vireo	n	1	M	n			for;nrv	
Red-eyed Vireo	Y	1	M	y			for	
Golden-winged Warbler	n	1	M	n			ofd;fed	
Northern Parula	n	1	M	y			For	
Yellow Warbler	Y	1	M	n			ofd;fed;fwt	
Black-throated Green Warbler	n	1	M	n			For	
Yellow-throated Warbler	Y	1	M	n			for;nrv	
Cerulean Warbler	n	1	M	n			For	
American Redstart	Y	1	M	y			for;FEd	
Prothonotary Warbler	Y	1	M	y			for;fwt	

Worm-eating Warbler	Y	1	M	y	for;Awc
Ovenbird	Y	1	M	y	for
Kentucky Warbler	Y	1	M	y	for
Common Yellowthroat	Y	1	M	n	Thc;OFd;Fwt;Swt
Hooded Warbler	Y	1	M	y	for
Yellow-breasted Chat	Y	1	M	n	OFd;FEd
Summer Tanager	Y	1	M	y	for;Cnf;Awc
Scarlet Tanager	Y	1	M	y	for
Dickcissel	n	1	M	n	fId
Vesper Sparrow	n	2	M	n	En fId
Savannah Sparrow	n	2	M	n	Th fId;swt
Grasshopper Sparrow	Y	1	M	n	Th fId
Seaside Sparrow	Y	n	M	n	swt
Bobolink	n	1	M	n	Th fId
Eastern Meadowlark	Y	2	M	n	fId;Swt
Orchard Oriole	Y	1	M	n	MxU;FEd



CAPE MAY NATIONAL WILDLIFE REFUGE



*United States Fish and Wildlife
Service
Department of the Interior*

Cape May NWR Fact Sheet #1
May 1995

OVERVIEW

Created in 1989, the Cape May National Wildlife Refuge is one of the newest refuges within the National Wildlife Refuge System. The Refuge will ultimately protect about 16,000 acres of critically important wildlife habitat in the heart of New Jersey's Cape May peninsula.

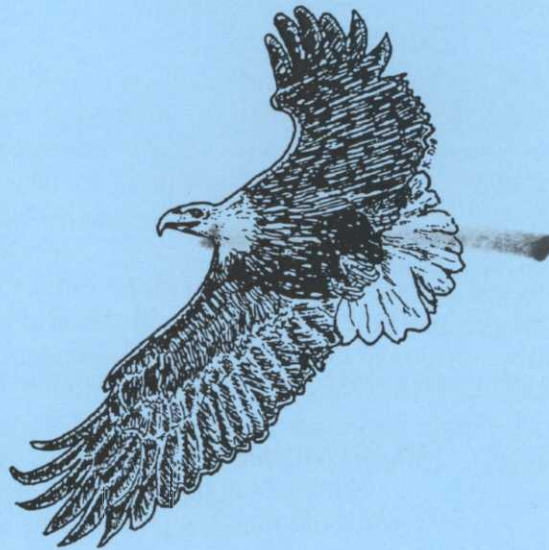
The Refuge is a "Flagship Project" under the North American Waterfowl Management Plan. The Plan is a far-reaching international agreement to preserve and restore millions of acres of wetlands across the United States and in Canada. This massive wetlands protection effort involves the private sector, conservation organizations, and State and Federal agencies in joint ventures.

The Refuge has two separate divisions. The Delaware Bay Division, located in Middle Township, extends along the Delaware Bay shoreline about five miles. The Great Cedar Swamp Division straddles Dennis and Upper Townships. The 16,000-acre Refuge acquisition area contains about 12,000 acres of forest, 3,000 acres of open marsh, 500 acres of fields and 500 acres of open water, disturbed areas and rights-of-way.

Acquisition

The Fish and Wildlife Service acquired the initial 90 acres of the Refuge from the Nature Conservancy in June 1989. In conjunction with county and state government and conservation organizations, the Refuge will contribute to the long-term protection of a vital greenbelt corridor from the Delaware Bay to the Great Egg Harbor Bay.

Since 1989, the Service has purchased about 6,400 acres from willing sellers in Cape May County. Only willing sellers will be considered for acquisition.



Endangered Species and National Resource Species

The Service has designated 72 fish and wildlife species or groups of species as National Resource Plan species, and several others as Regional Resource Plan species. This designation serves to identify priority management needs, and to focus and coordinate Service planning efforts. The Cape May Refuge supports at least 30 of these specially designated species at some point during their life cycles. National Resource Species which use the Refuge include:

Bald Eagle (endangered)
Peregrine Falcon (endangered)
Canada Goose
Black Duck
Wood Duck
Mallard
Canvasback
Osprey
American Woodcock

Woodcock

During the fall migration, American woodcock concentrate in large numbers in moist woodlands and thickets on the Cape May peninsula. Cape Charles, Virginia is the only other area along the Atlantic Coast where woodcock concentrate in comparable numbers.



Raptors

Large numbers of 15 different raptors species are regularly observed during fall migrations. Because these birds usually do not cross large stretches of open water, most use the bayshore upland forest edge as a migration corridor. The woodlands of Cape May peninsula are also important to wintering owl populations.

Songbirds and Neotropical Migrants

During the fall migration nearly 100 species of songbirds pass through the Cape May peninsula using a variety of habitats. The greatest number and the greatest diversity use woodlands.

Fishery Resources

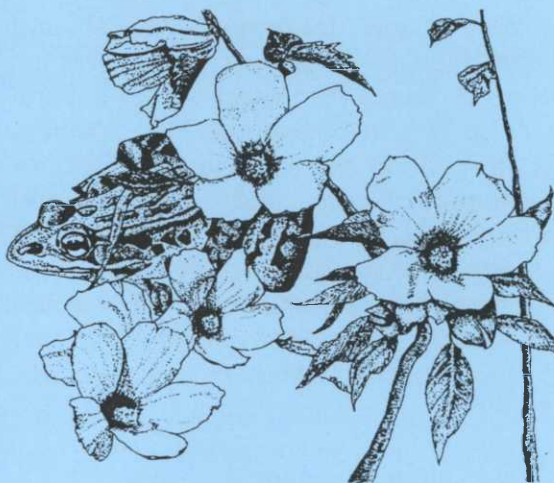
The coastal bays, marshes and tidal creeks provide important nursery grounds and nutrient sources for many species. Commercial and recreational fisheries benefit both directly and indirectly from Refuge protection.

Endangered Plants

There is one plant species, swamp pink, within the Refuge area that is Federally listed as threatened. Three other plant species are being considered for possible Federal listing. New Jersey Department of Environmental Protection lists as Endangered or threatened 53 species believed to be found in the Refuge area.

Shorebirds

The Delaware Bay shoreline has gained international recognition as one of the major shorebird staging areas in North America, second only to the Copper River Delta in Alaska. Hundreds of thousands of shorebirds - nearly 80% of some populations, stop to rest and feed here during their spring migration from South and Central 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 horseshoe crab spawning season. Horseshoe crab eggs provide an abundant source of food for these shorebirds to replenish their energy reserves. In May 1992 the Delaware Bay Estuarine System was designated as a Wetland of International Importance under the Ramsar Convention.



Other Values

In addition to the importance of the Cape May peninsula to fish, wildlife and plant resources, the Refuge's holdings serve a variety of hydrologic functions, such as, flood storage, ground water discharge and recharge, water quality protection, and shoreline stabilization. "Critical" edge habitats filter out pollutants and sediments before they reach estuarine wetlands and open bay waters. As some of the last vestiges of open space, wetlands also have high recreational, aesthetic, and educational values.

Public Use

The Cape May Refuge has been opened to Non-consumptive/Wildlife-Oriented public uses, such as wildlife/wildlands photography, environmental education, birding, and interpretation. Public recreation is permitted on National Wildlife Refuges as an appropriate incidental or secondary use only after it has been determined that such recreational use is practicable and not inconsistent with the primary purposes for which a particular Refuge was established.

Since the founding of our Nation, more than half of the wetlands in the 48 contiguous States have been destroyed. Habitat and wildlife need **your** help to survive.

For further information contact:

Refuge Manager
[REDACTED]

Cape May Court House, NJ 08210
609-463-0994
FAX 609-463-1667

Illustrations courtesy of Karen Day of the Delaware Bay Estuary Project.

CAPE MAY NATIONAL WILDLIFE REFUGE
24 KIMBLES BEACH ROAD
CAPE MAY COURT HOUSE, N.J. 08210-2078

CAPE MAY NATIONAL WILDLIFE REFUGE

DELAWARE BAY DIVISION

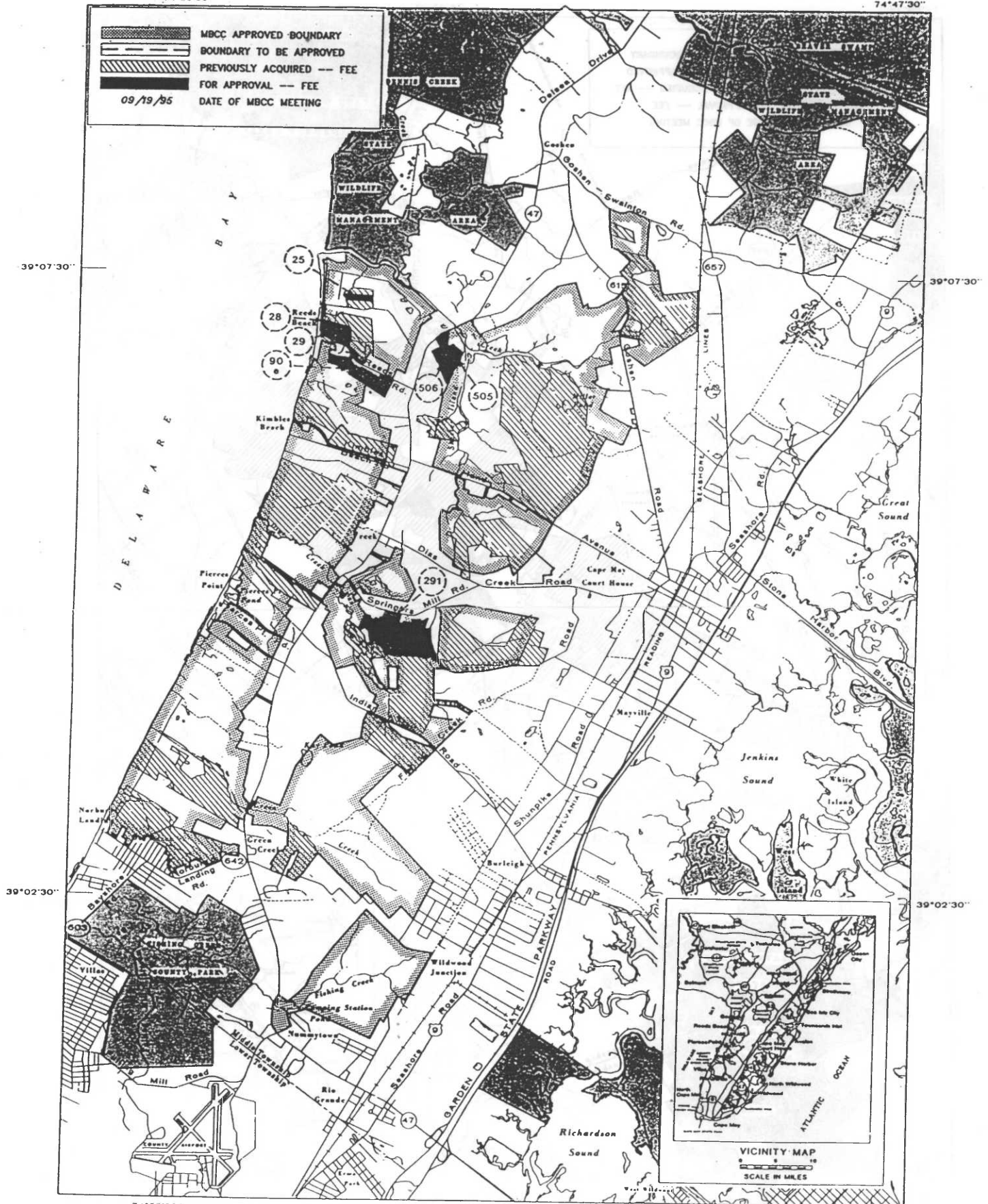
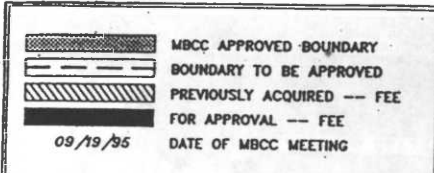
UNITED STATES
DEPARTMENT OF THE INTERIOR

CAPE MAY COUNTY, NEW JERSEY

UNITED STATES
FISH AND WILDLIFE SERVICE

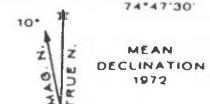
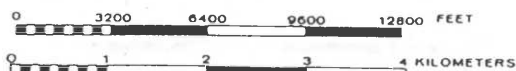
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74°47'30"



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MAPS BY U.S.G.S. & U.S.F.W.S.

HADLEY, MASSACHUSETTS
REVISED: 07/20/95



CAPE MAY NATIONAL WILDLIFE REFUGE

GREAT CEDAR SWAMP
DIVISION

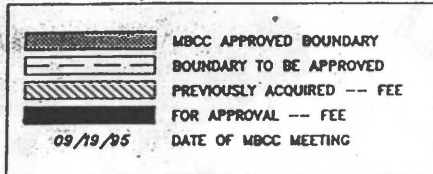
UNITED STATES
DEPARTMENT OF THE INTERIOR

CAPE MAY COUNTY, NEW JERSEY

UNITED STATES
FISH AND WILDLIFE SERVICE

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HADLEY, MASSACHUSETTS
REVISED: 07/20/95

DECEMBER 1986

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