

EDWIN B. FORSYTHE  
NATIONAL WILDLIFE REFUGE  
OCEANVILLE, NEW JERSEY

ANNUAL NARRATIVE REPORT  
CALENDAR YEAR 2000

US DEPARTMENT OF INTERIOR  
FISH AND WILDLIFE SERVICE  
NATIONAL WILDLIFE REFUGE SYSTEM

**REVIEWS AND APPROVALS**

**EDWIN B. FORSYTHE  
NATIONAL WILDLIFE REFUGE**

**ANNUAL NARRATIVE REPORT**

**Calendar Year 2000**

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Refuge Manager

4/16/2004  
Date

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4/26/04  
Date

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Regional Office Approval

3/4/04  
Date

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## INTRODUCTION

Edwin B. Forsythe National Wildlife Refuge is located on the Atlantic Ocean in New Jersey, extending from Brick Township, Ocean County to Galloway Township, Atlantic County. It is one of the original four United States wetlands designated as a "Wetlands of International Importance" under the United Nations Convention on Wetlands of International Importance, also known as the Ramsar Convention. E. B. Forsythe National Wildlife Refuge was created on May 22, 1984 by Congress (98 Stat. 207). The Act combined the former Brigantine and Barnegat National Wildlife Refuges. At present, the refuge totals over 44,000 acres of coastal salt meadow, upland field, woodland, open bays and channels, and barrier beach.

The Brigantine NWR was established on October 5, 1939, under the authority of the Migratory Bird Conservation Act to preserve estuarine habitats important to the Atlantic brant (*Branta bernicla*) and to provide nesting habitats for black ducks (*Anas rubripes*) and rails. The Brigantine Division encompasses about 24,000 acres in Atlantic, Burlington, and Ocean Counties. The division is bounded on the east by the Atlantic Ocean and on the north and west by U.S. Route 9.

The Barnegat NWR was established on July 1, 1967, under the authority of the Migratory Bird Conservation Act to preserve estuarine feeding and resting habitat for ducks and brant. The Barnegat Division encompasses about 20,000 acres in Ocean County. The division extends from the Reedy Creek Unit in Brick Township to the Holgate Unit in Long Beach Township.

E. B. Forsythe National Wildlife Refuge is located entirely within the Atlantic Coastal Plain, with elevations ranging from sea level to 50 feet above mean sea level (msl). Estuarine marsh dominated by salt marsh cordgrass (*Spartina alterniflora*) and saltmeadow cordgrass (*S. patens*) is the most abundant habitat. Most of the marsh were ditched in an attempt to control mosquitoes. Palustrine forested wetlands on the refuge are dominated by red maple (*Acer rubrum*), oaks (*Quercus spp.*), black gum (*Nyssa sylvatica*), sweetgum (*Liquidambar styraciflua*), and occasional stands of Atlantic white cedar (*Chamaecyparis thyoides*). Grasslands occur mainly at the interface between the salt marsh and woodlands. Upland woodlands are dominated by pitch pine (*Pinus rigida*), red maple, and various oaks, while reverting grasslands contain forbs and grasses interspersed with sassafras (*Sassafras albidum*), eastern red cedar (*Juniperus virginiana*), and winged sumac (*Rhus copallina*).

Two large managed impoundments are an important feature of the Brigantine Division. These impoundments were established in the early 1950's by construction of a dike system in the coastal saltmarsh around the mouth of Doughty Creek. The West Pool, 329 ha., is managed as a freshwater impoundment (<8 ppt salinity). For decades, freshwater has been held in the West Pool to provide habitat diversity for waterfowl, shorebirds, and wading birds. The pool is managed to provide resting and feeding habitat during the fall and spring migrations and critical wintering habitat. During the summer, the pool provides brood

habitat for waterfowl. The East Pool, 217 ha., is managed as a brackish impoundment (10-30 ppt salinity). It is managed to provide waterfowl nesting and brood-rearing habitat.

Additional freshwater areas at the Brigantine Division include the Experimental Pool (spring fed), a sand borrow pit, and a gravel pit both of which are fed by precipitation and upland runoff.

Three freshwater "stop ditch" impoundments are located on the Barnegat Division. These areas were formed by plugging old mosquito control ditches and channels and are fed by upland streams. Management activities focus to provide migration, winter, and brood-rearing habitat for waterfowl, shorebirds, and other waterbirds.

The Holgate Unit, Little Beach Island, and the unaltered salt marsh areas of the refuge comprise the 6,603 acre Brigantine Wilderness, which was established by Congress on January 3, 1975 (P. L. 93-632 ). The Holgate Unit consists of about 450 acres of barrier beach, dunes, and tidal saltmarsh located at the southern tip of Long Beach Island. The Holgate Unit was purchase from the National Audubon Society in 1960. Holgate is one of New Jersey's most important areas for beach-nesting birds, for example, piping plovers (*Charadrius melodus*). It is also the site of a large least tern (*Sterna antillarum*) colony and a large black skimmer (*Rynchops niger*) colony. Little Beach Island is one of the last undeveloped barrier beaches along the New Jersey coast. It lies between Little Egg Inlet to the north and Brigantine Inlet to the south, stretching approximately 5 miles in length and can only be reached by boat. Little Beach Island consists of barrier beach, dunes and tidal saltmarsh which provides a variety of habitat to be used by waterfowl, marsh birds, and shorebirds for nesting, migration, and wintering. It, too, is one of New Jersey's most important areas for beach-nesting birds such as the piping plover, and American oystercatcher (*Haematopus palliatus*). Both the Holgate Unit and Little Beach Island are subject to drastic changes in appearance due to coastal storms (especially "nor'easters") and hurricanes.

The refuge's objective is to preserve and manage wetlands for waterfowl, shorebirds, and other wildlife as production, migration and wintering habitat. Another objective is to perpetuate existing habitat to benefit rare or endangered species.

Other refuge objectives are to provide opportunities for wildlife observation and photography, fresh- and saltwater fishing, clamming, crabbing, waterfowl hunting, big-game hunting, interpretation, environmental education and scientific study and research. The refuge permits these activities only when the activities are compatible with the mission of the National Wildlife Refuge System and the refuge purposes.

### **A. HIGHLIGHTS**

The Region released the Revised Jersey Coastal Refuges Comprehensive Conservation Plan for public review and comment (Section D. 2).

## **B. CLIMATIC CONDITIONS**

The climatological data for the Edwin B. Forythe NWR is from a National Oceanic and Atmospheric Administration Station located at Atlantic City International Airport. Although this station is located 7 miles inland from the Brigantine Division headquarters, it is the closest official weather station. With the refuge stretching over 45 miles of coast, conditions vary dramatically and no one location can accurately record conditions for the entire refuge.



## Notes

(blank)Not reported.

X Monthly means or totals based on incomplete time series. 1 to 9 days are missing. Annual means or totals include one or more months which had 1 to 9 days that were missing.

S Precipitation amount is continuing to be accumulated. Total will be included in a subsequent monthly or yearly value. Example: Days 1-20 had 1.35 inches of precipitation, then a period of accumulation began. The element TPCP would then be 00135S and the total accumulated amount value appears in a subsequent monthly value. If TPCP = "M" there was no precipitation measured during the month. Flag is set to "S" and the total accumulated amount appears in a subsequent monthly value.

+ Occurred on one or more previous dates during the month. The date in the Date field is the last day of occurrence. Used through December 1983 only.

M Used to indicate data element missing.

A Accumulated amount. This value is a total that may include data from a previous month or months or year (for annual value).

T Trace of precipitation, snowfall, or snowdepth. The precipitation data value will = zero.

B Adjusted Total. Monthly value totals based on proportional available data across the entire month.

Elem->Element Types are included to provide cross-reference for users of the NCDC CDO System.

EAn estimated monthly or annual total.

StationStation is identified by: CoopID/WBAN, Station Name, State.

## C. LAND ACQUISITION

### 1. Fee Title

The Service acquired 2 tracts encompassing 353.2 acres at a cost of \$1,000,000.

**Table 2 . Land Acquisition in FY 2000**

Tract No.	Tract Sub No.	Acquisition Date	Acres	Cost
2077		12/8/1999	4.07	\$157,000
2001		09/19/2000	191.02	\$835,000
2001	Zz	09/20/2000	162.18	\$165,000

### 3. Other

The existence of a preexisting right-of-way across the refuge-owned Zell Tract in Ocean Township was confirmed. The right-of-way opened the way for a major residential development between the Zell tract and the Garden State Parkway within the approved refuge acquisition boundary. In March, Dan Ashe, Chief of the National Wildlife System, and Washington Office Division of Realty personnel met with representatives of the Izaak Walton League on this right-of-way issue at the Barnegat Division office. Project Leader Atzert and Realty Specialist Axel Larson also attended the meeting.

## D. PLANNING

### 1. Master Planning

The region released a revised draft Comprehensive Conservation Plan for the Edwin B. Forsythe and Cape May National Wildlife Refuges in July.

### 2. Management Planning

In July, we submitted a Fire Management Plan to Allen Carter, Regional Fire Coordinator. This plan was needed to continue our prescribed burn program. A contractor, formerly with the U.S. Forest Service, helped prepare the plan.

### **3. Public Participation**

On July 19, the refuge held a public hearing at Absagami High School to receive comments on the revised draft Comprehensive Conservation Plan for the Edwin B. Forsythe and Cape May National Wildlife Refuges. Over 80 persons attended the meeting. The major topics of interest were beach buggy access to the Holgate Unit of Forsythe NWR and summer access to the Two Mile Beach Unit of Cape May NWR. Bill Archambault, Region 5 Coordinator for NEPA (National Environmental Policy Act), served as facilitator. The meeting was orderly and civil. The Regional Chief and the entire refuge staff attended the meeting. The ratio of pro-beach buggy comments to anti-beach buggy comments was about 4 to 1.

### **5. Research and Investigations**

Waterfowl Use of Impounded Wetlands within U. S. Fish and Wildlife Service, Region 5

In September and October, Biologist Turner and SCEP Student Jones surveyed vegetation and observed waterfowl and water bird feeding activity in the West Pools. Vegetative was sampled at 60 randomly selected points. The study was designed by USGS and West Virginia University. In addition, Turner and Jones weekly surveyed all birds in the West Pools until mid-February 2001.

## **E. ADMINISTRATION**

### **1. Personnel**

Steve Atzert, Project Leader, GS-0485-14, PFT, EOD 05/15/95

Tracy Casselman, Deputy Project Leader, GS-0485-13, PFT, EOD 1993

Martha Hand, Office Assistant, GS-0303-07, PFT, EOD 04/22/79

Cindy Heffley, Office Automation Assistant, GS-0326-05, PFT, EOD 08/14/99

Paul Steblein, Wildlife Biologist, GS-0486-12, PFT, EOD 06/08/97, transferred to Great Swamp NWR 07/00

Amy Jones, Fish and Wildlife Biologist, GS-0401-05, PFT, EOD 05/09/99

Linda Rubenstein, Outdoor Recreation Planner, GS-0023-11, PFT, EOD 06/08/81

Sandra Perchetti, Outdoor Recreation Planner, GS-07, PFT, EOD 06/24/94

Brian Willard, Park Ranger, GS-025-7, EOD 07/03/97

Thomas Holdsworth, Maintenance Worker, WG-4797-10, PFT, EOD

Kevin DesRoberts, Refuge Manager, (Barnegat Div) GS-0485-12, PFT, EOD 07/00

Vinny Turner, Wildlife Biologist, (Barnegat Div) GS-0486-09, PFT

Kevin Gormley, Refuge Officer, (Barnegat Div), GS-0025-08, PFT

Thomas Laskowski, Park Ranger, (Barnegat Div), GS-0025-5, TEMP, EOD 04/23/00, NTE  
04/22/01



Back Row: Tom Holdsworth, Brian Willard, Linda Rubenstein, Bruce Luebke (Cape May NWR), Greg Barna(AmeriCorps), Shawn Willox (AmeriCorps), Cindy Heffley, Steve Atzert, Tracy Casselman.

Front Row: Kevin DesRoberts, Eileen Lloyd (AmeriCorps), Sandy Perchetti, Tracy VanHise (AmeriCorps), Amy Jones

Not Present: Vinny Turner, Martha Hand

### 3. Other Manpower Programs

2000 was the third and final year of the partnership between the Forsythe NWR and AmeriCorps. At the end of the agreement, the group moved from the Forsythe NWR to a nearby Atlantic County park.

AmeriCorps members spent a busy year reaching out to the local community and beyond. "At the Refuge," an endangered species puppet show, written and produced by AmeriCorps members for Forsythe Refuge, had a touring schedule that made aspiring musician envious.

AmeriCorps improved the show by designing special one day refuge passes, activity books and buttons they handed out at the end of each show.

Outreach highlights:

- “Journey to Wellness Fair” at the Southern Ocean County Hospital - puppet show for 1,000 third graders
- Tiger Tiger Weekend at the Philadelphia Zoo - puppet show and T. R. Bear appearance
- Earth Day at the Cape May Zoo through Rutgers Cooperative Extension - puppet show
- The Regional Office’s National Wildlife Refuge Week event and the Montezuma NWR National Wildlife Refuge Week celebration - puppet show and T. R. Bear appearance.
- Boys and Girls Club of Atlantic City, NJ, - puppet show for 30 children to show the children how to use the puppets so they could put on their own puppet shows.
- Rutgers University teacher workshop - puppet show and T. R. Bear appearance.

AmeriCorps members worked on various biological surveys and studies, demolished an old billboard, painted the outside of the maintenance shop, and completed reconstruction and painting of the refuge auditorium to prepare it for new displays. The members divided their time between the Forsythe divisions and Cape May, where they removed an old house, brushed back trails and prepared The Two Mile Beach Unit for the seasonal closure.

#### **4. Volunteer Program**

In 2000, the refuges 146 volunteers contributed a total of 4,179 hours to the refuge -- 71 percent of the time was for Public Education and Recreation, 8 percent was for Studies and Surveys, 13 percent was for Habitat Restoration, and 3 percent was for Habitat Management.

This was the first year with a full time volunteer coordinator on staff. We reorganized the volunteer program to keep in step with the National Wildlife Refuge System Volunteer and Community Partnership Enhancement Act of 1998. We gave all volunteers new volunteer uniforms. Field volunteers received blue, cotton t-shirts, windbreakers and hats. Visitor contact volunteers received white shirts, and blue sweaters. All the articles had the volunteer logo. We provided the volunteers driver education, CPR/first aid, new volunteer orientation, safety, interpretation, and leading walks and programs training. We started a quarterly newsletter “The Nature of Volunteering,” edited by Volunteer Coordinator Sandy Perchetti.

Volunteers helped post and fence areas in preparation for the seasonal Holgate closure; monitored the peregrine nests at both the Brigantine and Barnegat Divisions; conducted weekly waterfowl counts; prepared and conducted environmental education programs for area school groups; provided visitor information services such as visitor walks and programs in the visitor center; maintained and repaired trails, boardwalk, and osprey platforms; conducted breeding bird and piping plover surveys and banding studies; constructed and monitored owl, bluebird and wood duck boxes; performed studies on Phragmites and owl pellets; and helped plan and hold special celebrations.

On *Earth Day*, Forsythe partnered with the Friends of Forsythe, AmeriCorps, Atlantic Audubon Society, the Noyes Museum, and Galloway Township. The partnership presented three workshops: (1) Commemorative Earth Day bags - Refuge visitors decorated reusable cloth bags with messages about saving the planet; (2) Bird Feeders from recycled soda bottles, and (3) Art from recycled material. In addition to the workshops, local science fair projects relating to the environment were displayed. Galloway Township announced the winners of its calendar contest, and the Mayor presented the awards. Atlantic Audubon offered van tours of the Wildlife Drive, T.R. Bear stopped by, and there were four showings of the "At the Refuge" puppet show.

On *International Migratory Bird Day*, Atlantic Audubon Society and Friends of Forsythe members offered guided walks through the Refuge.

On *Make a Difference Day* in October, Forsythe staff and volunteers clean up a city playground in Pleasantville. Children passing through the park helped and by the end of the day, we had ten extra young volunteers.

Edwin B. Forsythe's *National Wildlife Refuge Week Celebration* was held on Sunday, October 8. The theme was Ecotourism - Enjoying Nature. Twenty organizations displayed their information and work under two big tents. Children were entertained by T.R. Bear, the "At the Refuge" puppet show, face painting, storytellers, a migration game, nature walks and a NWR Series of Birding for Kids. Noyes Museum staff taught kids how to make Nature Masks. Family activities included the Refuge Week Series of Birding, musical entertainment, a compost workshop, nature walks, van tours, and guided kayak trips of the saltmarsh and back bays. Congressmen Jim Saxton (NJ-3rd) and Frank Lobiondo (NJ-2nd) spoke at the event. Philadelphia PAX-TV covered the event..

In 1999, T. R. Bear became the unofficial mascot of the Edwin B. Forsythe NWR. A volunteer, dressed in costume, becomes a life-size copy of the small, stuffed "T. R. Bears" many of the Friends groups are selling. 2000 was a very busy year for T. R. Bear. As our

good-will ambassador, he made many local public appearances. In addition, he has made his way across the U.S., visiting other refuges and regional offices that included a NWR week celebration in Hadley, MA, the Region 6 Project Leaders Meeting in Denver, CO, and the grand opening of the Cusano Environmental Education Center at John Heinz NWR at Tinicum in Philadelphia, PA. When the refuge sponsored a blood drive in May, he was the first to give blood.

In the Spring, a new volunteer group "Forsythe's Creative Garden Volunteers" was formed to start a wildlife garden. Under the leadership of biologist Paul Steblein, they took several field trips and learned the "ins" and "outs" of wildlife gardening.

Forsythe holds three special volunteer recognition events each year: a volunteer appreciation dinner during National Volunteer Week in April; a field trip, usually in August; and a holiday party with the staff in December.

This year's *award dinner* was held at a restaurant near the Refuge. Approximately 50 volunteers and their families attended. Special guest Tina Dobrinsky, National Refuge Support Group Volunteer and Partnership Coordinator attend the dinner. There were door prizes, gag gifts and special awards. Friends of Forsythe received an "Enjoy your time at the Refuge" clock for the Friends gift shop. Volunteer John Williamson was recognized for his innovative and award winning concept of "Refuge Week Series of Birding" to raise community awareness of the Edwin B. Forsythe NWR. Dr. Ed Bristow, president of the Friends, past president of the Atlantic Audubon Society and long-time volunteer was named Forsythe's Volunteer Of The Year. Dr. Ed Bristow was one of the first volunteers to be recognized under Director's Order No 121 and the National Wildlife Refuge System Volunteer and Community Partnership Enhancement Act of 1998. T. R. Bear, always looking for photo ops, looked on. Each volunteer received a FWS volunteer pin.

The refuge sponsored a field trip to the Philadelphia Zoo. Volunteers were treated to guided tours by the Philadelphia Zoo's docents (part of Forsythe's volunteer exchange program) and were given special tours of the Zoo's new Primate House.

Volunteers joined the Forsythe staff for food and fun at our annual *holiday party*, held at the Volunteer House on the Refuge.

## 5. Funding

**Table 3. Funding** (Dollars in thousands)

Fiscal Year	1261 (O&M)	1262 (MMS)	6860 (sales)	9264 (fire)	Total
1996	not available	not available	not available	not available	not available
1997	805.7	277.5	5.0		1088.2
1998	889.6	187.0	5.0		1081.6
1999	944.3	247.0	5.0		1196.3
2000	967.5	192.0			869.5

## 6. Safety

No significant accidents or injuries which resulted in loss of time occurred on the refuge during 2000. No accidents involving refuge vehicles were reported during the year.

In June 2000 a new fire/burglary alarm system with motion detectors and 36 hour battery backups was installed in the refuge headquarters and maintenance buildings by a local electronics contractor. Additionally, three smoke detectors were installed in the headquarters building.

While the refuge is located in a high risk area for Lyme's disease, no cases were reported by refuge staff in 2000.

## **8. Other**

Refuge Officers attended Region 5 inservice refresher LE training at NCTC. Refuge Officers re-qualified with firearms at the FAA Technical Center, and participated in a night shoot at the FAA Technical Center.

Refuge Officer Willard attended OCAT (pepper spray) instructor training in East Windsor, CT, attended the Law Enforcement Field Instructor Training Program at FLETC, and attended a pre-retirement seminar at the regional office in Hadley, MA.

Biologist Amy Jones completed the MOCC at Montezuma NWR in NY.

Office Assistant Heffley attended New Employee Orientation in the Regional Office,

Refuge staff members received CPR training. Refuge and ES staff members received Aviation Safety Training..

Maintenance Worker Thomas Holdsworth attended Resource Recovery and Conservation Act training in the Regional Office.

Holgate Volunteers Helen Greis and Lee Gant were given training for non-badge holding personnel.

## **F. HABITAT MANAGEMENT**

### **2. Wetlands**

The West Pool and East Pool in the Brigantine Division are the main managed wetlands within the refuge. The West Pool encompasses about 900 acres and the East Pool encompasses about 600 acres. The long dike separates the West Pool into the Northwest and the Southwest Pools. The cross dike separates the West Pool from the East Pool. There are currently 11 water control structures in the Brigantine impoundment dikes, 7 water control structures have water level gauges. Water levels and salinity are monitored weekly. Several of the water control structures are in dire need of repair. The cement water control structures (WCS 6 and WCS 11) no longer hold the boards with a tight fit and this allows water to leak.

The East Pool is brackish, with intermittent salt water influx to cycle both nutrients and aquatic organisms. The West pool is primarily fresh. *Phragmites*, or Common Reed, an invasive plant species forms dense monotypic stands in both the West and East pools. Water levels management and prescribed burning (F.9.) are used to control this species. During the first week of January water levels were dropped to dry out the pools. After the burns we raised the water levels in all three pools to about 2.5 feet above mean sea level (msl) to drown remaining sprouts. We used heavy rains to raise the water in the West Pools. We used high tides from a Noreaster to raise the water levels in the East Pool. We opened WCS 11 on April 26 ending the fourteen days of elevated water levels.

On May 5 we removed stop logs from the cross dike structure to drain the Northwest Pool. However, the water remained relatively high at 1.9 feet above msl throughout the month. This was due to a very wet spring. The plan was to expose mud flats for migrating shorebird. The water level in the Northwest Pool remained at around 1.9 feet above msl almost the entire growing season. In the fall we increased it to 2.55 feet above msl to accommodate arriving wintering waterfowl.

The Southwest Pool water levels were high throughout the year, peaking in early August at 2.9 feet above msl. The target depth beginning in June was 2 feet above msl, but the very wet spring and summer frustrated our plan.

From July until December the water control structures in the East Pool were open to allow tidal flow. In December the structures were closed to end the flow of tidal water. In December the water level dropped from 1.5 feet to 1.2 feet above msl and the salinity decreased from about 30 ppt to 10 ppt. Despite the lower water levels, numerous waterfowl species used the impoundment.

### **3. Forests**

About 1/3 of the trees planted in 1999 died during 2000 due to lack of supplemental watering. About 2000 pitch pines and 1000 hardwood species (white and red oak, red maple and black gum) were planted in the upland fields west of the Wildlife Drive.

### **5. Grasslands**

In November, Eric Schradung from the New Jersey Field Office, used a warm season grass seed drill to seed a warm season grass and native flower mix in the small field across from the Brigantine Division HQ. The field was treated with glyphosate in early October in

preparation for the seeding. It will take at least three years to determine the full results of the seeding. If the seeding is a success, we will convert other refuge grasslands to warm season grasses.

## **9. Fire Management**

On February 29, we burned the northeast corner of the West Pool. The fires did not carry well, we only burned about 1/4 of what we planned to burn. Ground moisture and the high level of humidity from the ground surface to about two feet above the ground were probably the cause.

On March 3, we and personnel from the New Jersey Forest Fire Service burned in the West Pool. For the first time, a Heli-Torch apparatus was used on the refuge. The results in the West Pool fell short of our expectations. As in the burn in late February, the fires would did not carry well. Granted, a much large area was burned than what even could have been burned by hand. The Heli-Torch results in the East Pool were more satisfactory.

On March 10, we burned islands in the East Pool. At the start of the burn, conditions were well within prescription, but in a matter of minutes, the winds drastically shifted from the west to the southeast. After the change, we did a test burn and decided to burn on the east side of the East Pool.

On March 13, we burned additional islands in the East Pool islands and completed burning the northeast corner of the West Pool.

On May 1, the New Jersey Forest Fire Service (NJFFS) reported a wildfire burning on refuge property near Stoney Hill Road. NJFFS dug a plow line to surround and contain the fire. Apparently the fire started on private property and then spread onto the refuge. About two acres were burned.

On November 9, we and the New Jersey Forest Fire Service burned the small field across from the Brigantine Division HQ. We burned to prepare the area for seeding it to warm season grasses (Section F.5).

## **10. Pest Control**

No cases of West Nile was reported in Ocean, Burlington, and Atlantic Counties. But with this new public health issue, it was decided that mosquito pesticide applications will continue in the same fashion as in the past.

During the summer months, Ocean County Mosquito Control continued to conduct Open Marsh Water Management (OMWM) to control the mosquito populations. Ocean County Mosquito Control dug ditches in some areas to improve tidal flows to encourage small bait fish to consume mosquito larva.

## **12. Wilderness and Special Areas**

In October, surveyors from the RO established three bench marks down the spine of the Holgate peninsula so we can delineate the mean high tide line, which is critical for the refuge to enforce the no motorized vehicle provision of the Wilderness Act.

## G. WILDLIFE

## 2. Endangered and Threatened Species

The following endangered and/or threatened species may be found on the refuge:

<u>SPECIES</u>		<u>Federal</u>	<u>State</u>
Least Tern	( <i>Sterna antillarum</i> )		E
Black Skimmer	( <i>Rynchops niger</i> )		E
Piping Plover	( <i>Charadrius melodus</i> )	T	E
Roseate Tern	( <i>Sterna dougallii</i> )	T	E
Bald Eagle	( <i>Haliaeetus leucocephalus</i> )		E
Osprey	( <i>Pandion haliaetus</i> )		T
Peregrine Falcon	( <i>Falco peregrinus</i> )		E
Cooper's Hawk	( <i>Accipiter cooperii</i> )		T
Northern Harrier	( <i>Circus cyaneus</i> )		E*
Red-shouldered Hawk	( <i>Buteo lineatus</i> )		T/E*
Yellow-crowned Night Heron	( <i>Nyctanassa violaceus</i> )		E
Black Rail	( <i>Laterallus jamaicensis</i> )		T
Short-eared Owl	( <i>Asio flammeus</i> )		E
Barred Owl	( <i>Strix varia</i> )		T
Red-headed Woodpecker	( <i>Melanerpes erythrocephalus</i> )		T
Savannah Sparrow	( <i>Passerculus sandwichensis</i> )		T
Grasshopper Sparrow	( <i>Ammodramus savannarum</i> )		T*
American Bittern	( <i>Botaurus lentiginosus</i> )		T*
Red Knot	( <i>Calidris canutus</i> )		T
Upland Sandpiper	( <i>Bartramia longicauda</i> )		E
Black-crowned Night Heron	( <i>Nycticorax nycticorax</i> )		T
Bobolink	( <i>Dolichonyx oryzivorus</i> )		T
Pied-billed Grebe	( <i>Podilymbus podiceps</i> )		E*
Pine Barrens Treefrog	( <i>Hyla andersonii</i> )		E
Bog Turtle	( <i>Clemmys muhlenbergi</i> )		E

\* = Only breeding population endangered or threatened

## Piping Plovers

Because money from the B.T. Nautilus oil spill ended this year and the Anitra oil spill settlement is still pending, the State wants to make the municipalities responsible for monitoring beach nesting birds on municipal beaches. In February, Biologist Turner met with personnel from the New Jersey Division of Fish and Wildlife, The Nature Conservancy, and Cape May Bird Observatory at Rutgers University to discuss developing a statewide management plan for the monitoring of piping plovers and other beach nesting birds. The plan would be a municipalities "guidebook" for monitoring these nesting species.

On June 1, we conducted the annual Atlantic Flyway Piping Plover Breeding Census on the Holgate Unit. Thirty-four adults and three chicks were observed. Even though this year was one of the cooler and wetter summers in recent memory, piping plover productivity at Holgate was better than in 1999. This year, 19 nesting pairs fledged 19 chicks for a productivity of 1.0 chicks per nesting pair. In 1999, 24 nesting pairs fledged 20 chicks for a productivity rate of 0.83 chicks per nesting pair. Biologist Turner, SCEP Student Jones and Americorps member Eileen Lloyd monitored the plover nesting at Holgate.

We actively controlled mammalian predator numbers and plover losses to mammals were low. We did not control avian predators. However, avian predation is increasing. Gulls are the main problem. Last year, gulls started perching on top of the predator exclosures. We have observed as many as eight gulls waiting on top of the exclosure for a chance to get the eggs. No eggs were lost, but chicks were lost after hatching due to this behavior. If signs of this behavior continues in 2001, aggressive measures will be taken to address the problem.

On June 2, we conducted the annual Atlantic Flyway Breeding Census on Little Beach Island. Fourteen 14 adults but no chicks were observed. This year, eight pairs of plovers fledged 10 chicks for a productivity rate of 0.80 chicks per nesting pair. Productivity hasn't dipped below 1.0 in two years. Though vegetation encroachment is reducing the available nesting habitat, we believe that Little Beach could easily carry 16 to 20 nesting pairs. Why more plovers don't use Little Beach is a mystery. Americorps members did most of the plover nesting monitoring at Little Beach.

We actively controlled mammalian predator numbers, but a fox did dig under an exclosure.. Unlike Holgate, gull are not a big problem at Little Beach.

On June 14, Biologist Turner met with Cape May LE Officer Welsh at the Two Mile Beach Unit of the Cape May NWR to investigate the possibility of nesting piping plovers. They observed a pair moving about on the south end of the Coast Guard beach, but did not find a

nest. Later in the week a New Jersey Division of Fish and Wildlife biologist did find a nest. Sadly, two days later, June 17, one of the members of the State crew placing a predator exclosure over the nest accidentally stepped on it, destroying all four eggs.

#### Least Terns & Black Skimmers

Though not federally- listed as threatened or endangered, nesting populations of least terns and black skimmers are listed as endangered by the State of New Jersey. In the spring, we placed least tern decoys to draw in terns. After a six- year hiatus, least terns again established a nesting colony on Holgate. A total of 25 pairs nested between 11,500 and 12,500 feet south of Holgate's northern boundary. Only 5 - 7 tern young were fledged. Gull predation was the probable cause for low production.

Due to loss of nesting habitat on a small island south of Holgate, black skimmers also reestablish a nesting colony on Holgate. During the late 80's, Holgate hosted the largest colonies of black skimmers in New Jersey. During the late 90's, small numbers of skimmers loafed at Holgate's south tip, but did not nest. Their return in 2000 was a welcomed surprise. The colony consisted of 125 pairs and was located at the southern tip of Holgate. The birds fledged about 80 chicks by mid-September. With the tendency for site fidelity, we expect the skimmers to return in 2001 and establish an even larger nesting colony.

### **3. Waterfowl**

Numerous waterfowl species were observed in the refuge impoundments in 2000. Species frequently observed (Table1) include the American Black Duck, Northern Pintail, Mallard, Gadwall, American Widgeon, Northern Shoveler, the Bufflehead Green Wing Teal. The Ring Necked Ducks were seen October through December primarily in Lily Lake. A total of 154,634 waterfowl were observed in 2000.

**Table 4. Maximum Monthly Numbers of Waterfowl Observed**

Data compiled from weekly surveys conducted by the Atlantic Audubon Society  
Year 2000

Species	Jan.	Feb.	March	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Tundra Swan			2								210	32	244
Mute Swan		3	2	2			1	5	4	4	4	4	29
Snow Goose	6000	18	3000	1					2021	6141	10991	9777	37949
Canada Goose	571	981	1222	1165	899	1567	1353	308	246	524	224	814	9874
Brant	2438	5847	1759	2172	519	1				2384	15366	4365	34851
Mallard	256	285	206	151	91	64	8	91	65	210	545	655	2627
Black Duck	1284	3834	2336	2231	1230	143	180	345	340	894	3150	9396	25363
Gadwall	36	211	377	114	750	5	7	365	7	11	247	50	2180
Pintail	1765	1764	509	199			4		1760	4807	2627	1384	14819
G.W. Teal	133	421	4336	2816	31		15	491	796	7744	3486	1008	21277
B.W. Teal				16	7	2	16	2	6	8			57
Am. Wigeon	208	101	160						57	33	110	319	988
Shoveler	52	373	506	96	2	1		120	91	15	96	99	1451
Wood Duck	3	3	5	13	6	16	9	29	28	42	4		158
Gr. Scaup			1										1
Bufflehead	27	389	96								150	242	904
Ruddy Duck			1	6	5	1				40	4		57
Ring Neck Duck	2	7	29							4	35	8	85
Canvasback			182										182
Redhead			4										4
Cm. Merganser		12	13										25
Hd. Merganser	55	85	56	15				1	1	4	347	492	1056
R.B. Merganser		130	168	72	4							22	396
Rd. Throat. Loon			1										1
Common Loon					1						1		2
Horned Grebe	1	1	1	1							5		9
Pied Bill. Grebe	1		3						15	20	10		49
<b>Totals</b>	12832	14465	14975	9070	3545	1800	1593	1757	5437	22885	37612	28667	

Snow Geese departed the refuge in March of 2000 and returned like clockwork in late September, the first flock observed consisting of 2,021 birds. The numbers of Snow Geese using the impoundments has dropped in the last few years much to the delight of refuge staff, and this may in part be due to refuge hunting. (Section H.8.)

Canada Geese are present year round on the refuge and in great numbers. They do nest on the refuge and measures were taken to reduce Canada Goose productivity. Water levels were dropped (also in timing with the refuge prescribed burning) in time for nesting and were raised again to drown those nests. Eggs were added by refuge staff and AmeriCorps volunteers. Unlike the Snow Geese, Canada Geese population numbers on the refuge have not been decreasing despite hunting and management measures taken (Section H.8. ) Canada Goose numbers reached their peak this year in June when 1567 birds were observed.

#### 4. Marsh and Water Birds

Thirteen species of marsh and waterbirds were observed at the Forsythe Impoundments during the year 2000. September was the month with the highest number of waterbirds.

**Table 5. Maximum Monthly Numbers of Marsh and Water Birds Observed**

*Data compiled from weekly surveys conducted by the Atlantic Audubon Society*

**Year 2000**

Species	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Cormorant			20	447	601	58	79	221	396	363	27		2212
G. Blue Heron	6	13	9	9	7	5	15	18	29	50	25	50	236
L Blue Heron					3		2	3	21	1			30
BCN Heron	2			1	6	38	31	36	85	69	2	1	271
Green Bk. Heron						20	2	3	1				26
Tri-Colored Heron					1			2	2	1			6
Great egret			8	88	94	105	160	246	573	161	15	2	1452
Snowy Egret			4	169	117	123	194	269	413	210			1499
Cattle Egret					2	9	5	11	2	1			30
Glossy Ibis					11	32	235	241	22				541
Coot										1	2		3
Clapper Rail					6	6	2	4	4	4			26
Kingfisher	2			1					5	4	4		16
<b>Totals</b>	10	13	41	715	848	396	725	1054	1553	865	75	53	6348

## **7. Other Migratory Birds**

Volunteer Greg Gates conducted the annual Songbird Point Count survey during May. There are 50 sample points from the Brigantine HQ, north to the Reedy Creek Unit. This survey helps determine species usage and diversity prior to nesting. All collected data was put into a CENSUS program and sent to the South Zone Biologist.

Volunteers Mike O'Brian and John Latyon installed and maintained bluebird boxes and purple martin houses at the Brigantine Division. The volunteers greatly expanded the program in 2000. The volunteers also banded the young before fledging. Without the dedication of the volunteers to this program, nesting bluebirds and martins would be a rare site at Brigantine.

## **8. Game Mammals**

Rapid development continues adjacent to the refuge, forcing deer to become more dependant on refuge habitat.

## **9. Marine Mammals**

We observed common dolphins regularly offshore at Holgate during the summer months. Harp and harbor seals occasionally basked on the Holgate beach during the winter. There were no marine mammal strandings on Holgate.

## **10. Other Resident Wildlife**

The anuran survey began in 1999 and was repeated in 2000. We collected frog calling data at 13 sampling points in the Brigantine and Barnegat Divisions. The West Pool impoundments, Cedar Run Bogs, and Oxycocus Bogs were the locations with the greatest frog activity.

## **14. Scientific Collection**

A total of 616 Atlantic Brant carcasses were recovered -- all of these were either incinerated or necropsied (Section G.17). Four (4) Piping Plover eggs were removed from Holgate beach after the nest had been abandoned for weeks. We were going to use the eggs for public outreach but they were too deteriorated and were disposed of. These collections were

recorded in the Migratory Bird Salvage Report.

### **15. Animal Control**

We contracted with the USDA Wildlife Services to control predators at the Holgate and Little Beach Units to protect piping plover. Wildlife Services personnel used snares, box traps, shooting, and carbon monoxide gas cartridges. At Holgate, one feral cat was captured in a box trap, one fox was snared and three fox dens were gassed. Because dens are not examined after gassing, the actual number of foxes taken is unknown. At Little Beach, one fox and one raccoon were shot, five foxes were snared, and four fox dens were gassed.

### **16. Marking and Banding**

We again carried out the MAPS (Monitoring Avian Productivity and Survivorship) banding protocol from May 31 through August 3 at the Brigantine Division. We had ten mist nets in various habitat types. Biologist Turner and Patti Hodgett from the Cape May Bird Observatory carried out the protocol with assistance from Americorps members. This seasons we banded a total of 93 different birds representing 22 species (Table #6). Including recaptures and unbanded birds we mist-netted a total of 139 birds.

Refuge volunteers and two staff members from the New Jersey Field Office in Pleasantville banded 17 bluebirds and 79 purple martins at the Brigantine Division.

The New Jersey Division of Fish and Wildlife normally conducts pre-season waterfowl banding operations for the refuge, but in 2000 the Division did not conduct any pre-season waterfowl banding on the refuge.

From July 25 through September 1, Biologist Turner again participated in the annual western Canada pre-season waterfowl banding program. Turner worked in the Northwest Territories with Flyway Biologists Carl Ferguson and Karen Bollinger. Banding sites was located along the Stagg River delta, about 60 miles northwest of the city of Yellowknife. A total of 1146 birds were banded -- 1137 were mallards. Other species banded were: pintails, blue-wing teal, green-wing teal, and black duck

**Table #6. Number of Birds Banded**

Species	Banded	Recaptures	Captured/Unbanded	Total
Red Tailed Hawk			1	1
Red Bellied Woodpecker			1	1
Downy Woodpecker	2	1		3
Hairy Woodpecker	2			2
Great-crested Flycatcher	4			4
Blue Jay	7			7
Carolina Chickadee	5	4	1	10
Eastern Tufted Titmouse	7	2		9
Carolina Wren	5	5		10
House Wren	6		1	7
Species	Banded	Recaptures	Captured/Unbanded	Total
Eastern Bluebird			2	2
Grey Catbird	25	16	1	42
White-eyed Vireo	7	2		9
Magnolia Warbler	1			1
Common Yellowthroat	5	2		7
Northern Cardinal	3	1	1	5
Eastern Towhee	3	1	1	5
Field Sparrow	3	1		5
Wood Thrush	5	1		6
Worm-eating Warbler	1			1
Ovenbird	1			1
Brown Thrasher	1			1
<b>Total</b>	<b>93</b>	<b>36</b>	<b>9</b>	<b>139</b>

## 17. Disease Prevention and Control

On November 16, refuge staff retrieved 110 dead Atlantic Brant in and around the Brigantine impoundments, primarily the Southwest Pool. The dead birds were in good physical condition with lots of fat reserve, suggesting an acute disease. The refuge notified the N.J. Division of Fish and Wildlife and sent four carcasses to the U.S. Geological Survey National Wildlife Health Center for necropsy. Dead birds were collected until December 12. A total of 616 Atlantic Brant carcasses were collected. Starting November 23, we recorded the age class of the dead birds; 5 % of the dead birds were juveniles, 20% were adults and 75% were unknown. No other species of waterfowl was apparently affected by the die-off. One dead Mallard and one dead Pintail were collected and necropsied, but both had died from gunshot wounds.

Carcasses not submitted for necropsy were bagged and sent to the Popcorn Park Zoo in Lacey, NJ for incineration. Some carcasses were sent up to Dr. Doug Roscoe of the N.J. Division of Fish and Wildlife Health and Forensics and additional carcasses were also sent to Dr. Kimberli Miller of the U. S. Geological Survey National Health Lab. Neither Dr. Roscoe nor Dr. Miller were not able to determine the cause of death. However, several diseases were definitely ruled out: West Nile Virus, Avian Cholera and Avian Vacuolar Myelinopathy. Death due to ingested of pesticides was also ruled out.

Many people were involved with the collection effort, Deputy Project Leader Casselman, Biologist Jones, AmeriCorps volunteer Hibner and her dog Buster, N.J. Fish and Wildlife employees, Biologist Turner, Refuge Officer Willard. Refuge Officer Welsh and Assistant Refuge Manager Luebke from the Cape May NWR also assisted.



Amy Jones bagging Brant carcasses (MP)

One tagged Brant to be sent for necropsy (MP)



## H. PUBLIC USE

### **2. Outdoor Classrooms - Students**

Teachers brought about 6,500 students to the Brigantine Division. Many of these groups received an orientation and saw a video in the HQ auditorium before heading onto the Wildlife Drive and foot trails. Refuge volunteers from the Atlantic Audubon Society led most of the groups.

### **4. Interpretative Foot Trails**

The Refuge has three foot trails at the Brigantine Division and one foot trail at the Barnegat Division.

### **5. Interpretive Tour Routes**

The refuge has an eight mile long auto tour route. The tour route received about 145,000 visits this year.

### **6. Interpretive Exhibits/Demonstrations**

On March 5, Biologist Turner and AmeriCorps member Greg Barna staffed a refuge table at the annual Atlantic City Kids Fair. Interpretive and hands-on displays were available to both children and parents to examine and ask questions about. The event is one of the best opportunities for the refuge to reach out to the public and educate them about their immediate surroundings and the National Wildlife Refuge System.

On September 23 and 24, Biologist Turner, Barnegat Division Manager. DesRoberts, Office Assistant Heffley, RO Willard, Seasonal RO Laskowski, and Deputy Project Leader Casselman worked the Barnegat Bay Gunning and Decoy Show, sponsored by Ocean County Dept. of Parks and Recreation, in Tuckerton. Each year, refuge staff sell Federal Duck Stamps to the public and provide information on the refuge and the refuge waterfowl hunting program. Attendance at the show was lower than in the past, probably because it was rainy and cool both days of the show. Almost everyone we spoke to had good things to say about the refuge.

## 8. Hunting

### Deer Hunting

Forsythe contains three State Deer Management Zones (DMZ) -- 56, 57, and 58. Each hunt zone has a quota for the maximum number of hunters allowed. Hunting is allowed by permit only. Permits are issued by the New Jersey Division of Fish and Wildlife on a lottery basis. There is no separate refuge hunting fees. Fewer hunters are choosing to hunt on the refuge since 1998, when baiting for deer became legal in the State off refuge land.

Zone 56 includes approximately 250 acres between the Brigantine Division headquarters and Stoney Hill Road. Since much of this area is open to the general public and includes a portion of the Wildlife Drive, this zone was open only for shotgun hunting from December 11-15. During that period, the Wildlife Drive was partially closed to ensure visitor safety. In zone 56 there is no muzzleloader season or bow season.

Zone 57 includes refuge uplands south of the Mullica River and north of Stoney Hill Road. This zone's shotgun season was December 4-6 and December 11-13. This zone's muzzleloader season was November 27, 28, December 11, 12, 16, 18-23, 26-30, and January 1-5, 2001. This zone's bow season was October 28 - November 25.

Zone 58 includes refuge uplands north of the Mullica River to Barnegat Division Headquarters. The hunting season dates were the same as for Zone 57.

**Table 6. Deer Hunter Information for 2000/2001 Hunting Season**

Deer Mgt Zone	Weapon	Permit Quota	Permits Issued	Harvest
56	shotgun	25	20	23
57	shotgun	40	22	5
57	muzzleloader	40	23	7
57	bow	40	18	6
58	shotgun	50	26	12
58	muzzleloader	40	24	9
58	bow	40	20	4

Prior to scouting or hunting on the refuge, all refuge hunters have to get their state hunting permits validated in person at the refuge.

The refuge strongly encourages first time hunters to attend a refuge deer hunter orientation session to learn and understand the regulations for hunting on the refuge. Many of refuge hunting regulations are more restrictive than those of the State. Biologist Turner and RO Gormley conducted four orientation sessions: October 22, October 29, November 12 , and November 19. Two sessions were held at each division for the convenience of the hunters. About five hunter attended each session.

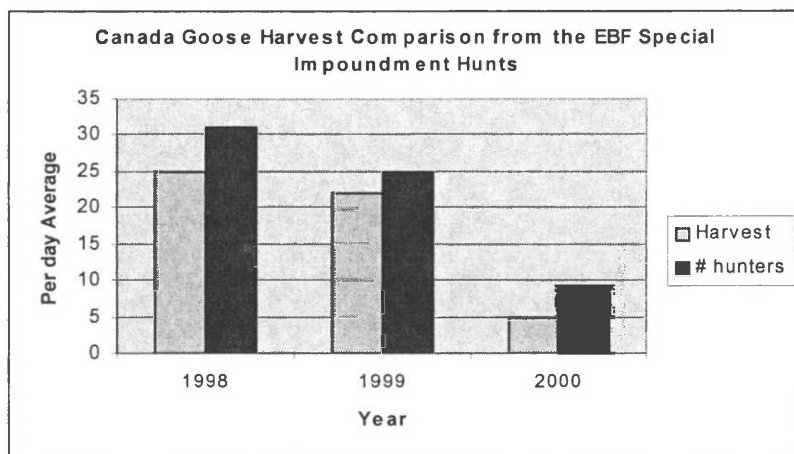
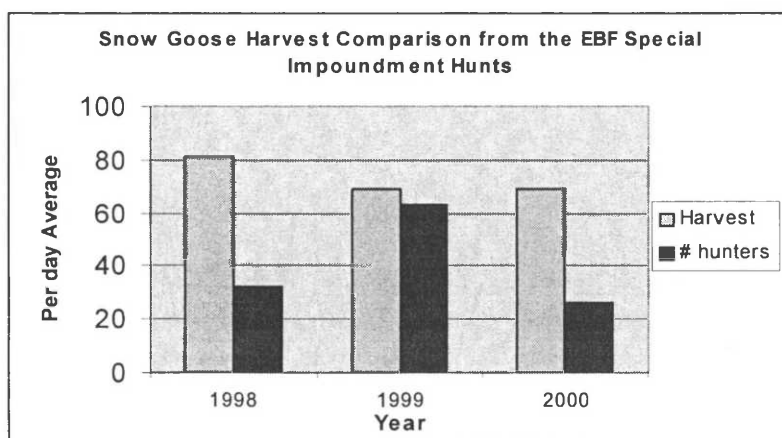
### Waterfowl Hunting

There are five waterfowl hunt units in the Brigantine Division (Units 1 through 5). There are four waterfowl hunt units in the Barnegat Divison (Units A through D). In addition, the refuge holds special resident Canada goose and snow goose hunts in the Brigantine impoundment area.

This year the refuge open all of Clam Island (Unit C) to waterfowl hunting and permitted jump shooting there. Previously we had limited waterfowl hunters to nine specific sites on Clam Island, because there was so much hunting demand. Hunting demand has dropped off in recent years.

The Refuge held special goose hunts one day per week during three period this year in line with State set waterfowl seasons: January and February for resident Canada geese and snow geese, September for resident Canada geese, and October for snow geese. During the special hunts, hunting was permitted at refuge-designated sites in the Brigantine impoundments and in the adjoining salt marshes. Hunters had to call in the day before the hunt to sign up. Each hunt day refuge staff gave a short orientation and conducted a lottery to determine the order in which hunt parties would select their sites. The auto tour route and walking trails were closed to all visitors, except the hunters, the days of the special hunts. Each hunt day volunteers staffed the front gate to greet regular visitors and direct them to alternative birding sites in the vicinity.

The following two charts present the number of hunters and the harvest figures for the special impoundment hunts for the last three years.

**Chart 1. Canada Goose Harvest Comparison****Chart 2. Snow Goose Harvest Comparison**

## 9. Fishing

The refuge provides fishing, crabbing and clamming opportunities. The most popular saltwater fishing areas are Graveling Point and Holgate. Graveling Point, provides excellent fishing for the spring runs of striped bass and bluefish. Holgate, on Long Beach Island, provides excellent surf fishing during September and October. The Ocean County Chamber of Commerce sponsors a fishing tournament on Long Beach Island, which draws anglers from all over New Jersey and Pennsylvania. Lily Lake provides freshwater anglers the opportunity to catch chain pickerel, largemouth bass, and various sunfish species. Because of the rehab work being done to the Lily Lake dam this year, the water level in the lake was down and there was little fishing action. Scott's Landing, Cedar Run Dock Road, and the 'Bridge to Nowhere' all provide exceptional crabbing opportunities. At low tide, clammers harvest clams on the bay side of Holgate.

## 10. Trapping

The refuge has had a public trapping program since the early 1970's. The primary purpose of the program is to keep muskrats and mammalian predators in check. Since the market for fur prices has been low, trapper participation on the refuge has been low. There are 14 trapping units on the refuge, seven units at each division. Six trappers submitted and received permits to trap. Combined division harvest totals are shown in Table #7.

**Table 7. Combined division harvest trapping totals.**

Species	Total
Muskrat	105
Red Fox	49
Raccoon	91
Mink	14
Opossum	20

In January, Biologist Turner pulled together trapping and predator control harvest data from 1994 through 1999 for a System-wide FOIA request by the Animal Protection Institution.

## 17. Law Enforcement

In 2000 the station had an enforcement staff of two full-time Refuge Officers, one seasonal Refuge Officer and one collateral duty Refuge Officer. Toward the end of the year, another collateral duty Refuge Officer was added to the ranks. The efforts of these Officers are documented in Table 8 below.

**Table 8. Number of Incidents.**

<i>Offence</i>	<i>Total number of incidents</i>
Burglary - Forcible entry	1
Larceny - Theft	5
Boating	1
Low flying aircraft	11
Motor Vehicle / Traffic (non ATV/DUI)	207
Timber theft	1
Occupancy trespass	1
General foot trespass including ATV use	705
Hunting / Fishing	76
Drug related incidents	6
Vandalism	290
All other offenses (fee, litter, pets, etc..)	440
Emergency Medical Services	1

### *Additional documented Law Enforcement incidents*

From New Years Day until the close of costal duck season on Jan 8th, 46 waterfowl hunters were checked. We issued two warnings and two federal violation notices.

Dirt bikes and All Terrain Vehicles (ATV) have become an increasing problem for Refuge Officers. The Barnegat Division hosts the majority of these problems. Specific areas with a high concentration of incidents are within the Oxycocus tract in Manahawkin, Refuge tracts within Lacey Township, and the Reedy Creek Division. The majority of these off road incidents involve juveniles. Some offenders have been as young as nine years old! On Thursday, April 20, five juveniles were apprehended on a newly posted area of refuge with one dirt bike, one quad, and one bicycle. That same day a dirt biker in the Oxycocus tract knowingly eluded apprehension. The following day a different individual was apprehended and cited for riding a quad in the same tract. This mentioned incident is a typical weekend day for Refuge Officers, especially during the warmer months.



*Refuge officer taking information on illegal riders.*

On January 26, in the Barnegat Division, two separate parties of snowmobilers were apprehended on the refuge resulting in three juvenile warning letters for trespassing and registration violations.

On January 22, a disoriented elderly male drove his vehicle over the exit treadles and onto the back side of the wildlife drive, resulting in two punctured tires.

On March 11, a marijuana pipe made out of a 12oz tin can was discovered on the ground off the end of the Barnegat platform.

On April 7, an entrance fee compliance check was conducted for one hour resulting in seven vehicles with 100% compliance. On May 7, two entrance fee compliance checks were conducted. The A.M. check resulting in 16 vehicles 100% compliance. The P.M. check resulting in 20 vehicles and two violation notices.

On June 3, a refuge owned house located at 417 Adamston Rd, Brick was vandalized. Most of the windows were smashed out along with some graffiti on the inside of the house. Val Hibner and Brian Willard secured the windows and side door with plywood at a later date.

During April, Seasonal Officer Tom Laskowski started work as the Holgate Seasonal. Throughout the month, Tom Laskowski received on the job training from Refuge Officers Willard and Gormley. On May 4, Tom Laskowski was certified in the use of OC by Officer Willard.

On May 6, Officers Laskowski and Willard encountered extensive resource damage on the Murray Grove trail consisting of dirt bike jumps. Two juveniles were apprehended in connection with the jumps and were made to restore the area.



*Dirt jumps at the Murray Grove tract*

On May 3, Oceanville Fire Dept. extinguished a three-acre fire that started in a wooded backyard of a house on Smith Bowen Rd. The fire burned up to a refuge fire lane which is also the boundary line. There was no damage to refuge property.

On July 1, the Recreational Fishing Alliance staged a protest at the eastern boundary of the refuge at the Two- Mile Beach Unit of the Cape May Refuge. The pre arranged protest

started at 9 A.M. and went until 11 A.M. with about 100 protesters in attendance. There was only one minor incident involving trespass that was handled with minimal force. Two Special Agents, two Refuge Officers, and one local officer were called in to assist with the protest.

Officer Willard erected a barricade at the Water St. house in Barnegat due to a vehicle trespass complaint.

On July 20, two individuals from Trenton, NJ were apprehended fishing from the bridge on Great Creek Road. They were cited and released and their poles were seized as evidence.

On August 19, a wave runner ran aground on Cedar Bonnet Island. Refuge Officers Gormley and Willard assisted in removing the craft. A summons was issued by the State for no registration.

On August 26, a red Zodiac became stranded on Holgate. The operator was unable to get the boat beyond the surf, on the third try the fuel line broke. Tom Laskowski contacted Sea Tow to remove the boat.

The Holgate unit was patrolled the Saturday and Sunday of the Labor Day weekend. There were eight incidents of trespass in the dune areas by walkers and two incidents of trespass by vehicles behind area closed signs and three visitor assists with stuck vehicles. On September 8, Holgate was reopened from 10,500 ft. to the southern tip. That same day a local resident was given a violation notice for entering a closed area.

On Sept 18, Refuge Appraiser William McLaughlin was rushed to the hospital for head injury sustained when a boat he was in hit a sand bar in Brigantine Channel. The resulting injuries required 42 stitches in his forehead.

The Big Event that occurred on Oct. 8, the end of National Wildlife Refuge Week, went smoothly with no law enforcement incidents. Congressmen Saxton and LoBiondo were in attendance. The day drew 670 people to the refuge.

On Oct 13, 3 damaged Noyes museum chairs and nine beer cans were found next to the front gate of the refuge at 6:00 A.M.

In October, we received a report that kids were digging dirt jumps again in the Murry Grove

section of the refuge. Kevin DesRoberts apprehended one kid using the jumps. He was told to level the jumps.

Also at Murray Grove, a party area consisting of a lean-to, two couches, and other junk was discovered off the main trail about ½ mile down from the gate. A male on a dirt bike was also apprehended.

On November 15, 18 cans of light whipped cream "whippets" were discovered at Scotts Landing. The same incident occurred last month.

Three bags of construction debris (shingles) were dumped in front of the gate on Scotts Landing Road.

In May, Refuge Officers discovered a Swastika and the initials "AH" carved in tree at the Barnegat platform.

On December 15, a Deer Management Zone 22 deer hunter was apprehended hunting on the Refuge in Deer Management Zone 58. The hunter was observed using a stand with screw-in steps, hunting over bait, not possessing a refuge zone permit, take and attempt to take a deer. The deer hunter was cited for multiple violations.

On Dec 17, at the Reedy Creek Unit, RO Laskowski shut off a running outside water nozzle at 417 Adamston Rd. The back and side door of 423 Adamston Rd were nailed shut from the inside, a refuge lock was put on the front door and the water was shut off for the entire house. RO Laskowski observed two kids on dirt bikes riding across refuge property.

On December 12, a Deer Management Zone 56 hunter discovered a badly decomposed immature bald eagle carcass off of Jen's Trail. The eagle had a radio collar and two leg bands. NJFGW said it was one of three from a nest on Nacote Creek. The eagles were banded in May of 2000. Foul play does not appear to be a factor. The carcass was turned over to the state.

**Miscellaneous law enforcement:**

Officer Willard met with the Coast Guard Air Group's Lt. Charles Carvolo. The Coast Guard agreed to modify their flight plan to better observe Holgate and Little Beach for illegal activity such as fires, camping, unauthorized boats. This new contact will add an excellent

information source for Refuge Officers.

Officer Willard met with Lt. Karsevar of Bass River State PD, Station Commander William Vowell of the State Marine Police in Atlantic City, and Lt. Pete Bacon of the Atlantic County Sheriffs Office. These meetings resulted in the ORI number for the refuge being entered into these local dispatch systems for look-ups by Refuge Officers.

On September 22, the Holgate LE vehicle was equipped with lights/siren, at Carter Fire and Safety. On the way back to Forsythe, the LE vehicle that was just picked up, was rear ended by a car while approaching a stop light.

State Conservation Officer Mike Massey lent Refuge Officers a spare portable radio with state fish and game frequencies.

Trigger locks were purchased and placed on all firearms at the Brigantine Division.

The Master lock system at the Brigantine division, Barnegat division, and Cape May was upgraded with a new lock system. The new lock system is comprised of Master Lock brand locks with removable cores and restricted keys to prevent duplication. The new locks were issued, keys for the new system were cataloged and signed out. Extra keys for certain locks were ordered.

In March the annual hearing test was given to all Refuge Officers.

### **Posting efforts during 2000:**

The seasonal closure of the Holgate Unit took place on April 3. Refuge Officer Brian Willard, Biologist Vinny Turner, and four AmeriCorps members erected all the signs necessary to close the beach to public use during the summer

Boundary and Public Fishing area signs on the east side of the "bridge to nowhere". Hunt sign at Scotts Landing was destroyed by high winds and replaced with the hunt sign at Chestnut Neck. On October 2, Biologist Turner and Refuge Officer Willard re-posted Clam Island as "At large hunting" and removed the old site specific markers. The five Barnegat hunt signs were rehabed and put up with help from Kevin DesRoberts and Matt Perdue. On October 6, DesRoberts and Willard fixed about 20 refuge signs in area B and the Turtle Cove Unit. On October 14, Casselman and Willard rehabed 12 signs including Unit 1 south

boundary and north of Turtle Cove. On October 15, Officer Willard posted Perch Cove and the entire Black Point area of Unit 2. Other areas of Unit 2 included Simpkins Thoroughfare, Little Mud Thoroughfare (hunt area and closed area), and Little Bay. Turtle Island was posted as a newly established hunt area on September 11. On September 15, the eastern boundary of Unit 5 was moved east, from Roundabout Creek south to Great Bay. Unit 3 was re-posted to include the old cabin area as part of the hunt unit. An island hunt area northwest of Brigantine Channel was posted.

A 4x8 Area Closed sign was installed on the west side of the first washover on Little Beach. An orange 4x8 was recovered from the west side of Little Egg Inlet. The sign was lost at Holgate a week prior in a storm.

Forty-five refuge boundary signs in the bay and creeks within the Brigantine Division were rehabed in April. Tract 708 (Mullica/Bass Rivers) was half completed with Val. Tract 1034 in the Barnegat Division, off Admiral Drive and Tip Seaman Drive was posted with the help from AmeriCorps members in April. Regional surveyors Tom Geezer and Jessie were escorted to the mouth of Wier Creek in Parkertown to conduct a survey. On May 10, the west side of Holgate and the entrance to first washover area on Little Beach were posted by boat.

## **18. Cooperating Associations**

In February, 2000, a Memorandum of Understanding was signed between the United States Fish and Wildlife Service and the Friends of Forsythe National Wildlife Refuge. Dr. Edgar Bristow, former president of the Atlantic Audubon Society, and long-time volunteer at the refuge, assumed the position of Board President.

In the spring the Friends opened a gift shop in a new 12 x 12 foot building. The Friends provided visitor information and sold gifts to raise funds for interpretive, educational, recreational, operational, maintenance, and biological support assistance. The Friends outlet was open 9 AM to 5 PM, Saturdays and Sundays during the Refuge's busiest seasons - March through June and again from September through December. Refuge volunteers, Friends members and AmeriCorps members staffed the store. During the first year of operation, about 2,000 visitors stopped at the Friends shop.

The Friends, Deputy Project Leader Tracy Casselman and Volunteer Coordinator Sandy Perchetti worked together to review new items for sale and to maintain a high standard of quality in all materials produced or sold.

**Table 9. Friends Group Revenue**

Revenues:		Disbursements:	
Sales:	\$ 5315.00	Association Operations:	\$ 2990.00
Donations:	364.00	Direct \$ to Station:	1139.00
Memberships:	1490.00		
Loans:			
Other:			
Gross Revenue:	7169.00	Total Disbursements:	4129.00

Total donations from the sales outlet to Forsythe Refuge equaled \$1,139.00

Other achievements and activities by the Friends of Forsythe included:

- Exhibit cases in Information Booth
- Special walks on International Migratory Bird Day
- Walks, birding tours, displays, free refreshments for National Wildlife Refuge Day
- Guides for school groups and other tourist groups.
- Development of a new display for auditorium (monthly calendar)
- Development, publication and distribution of guide map.
- Special trips such as Cruise of Back Bay Waters

Fins, Feathers & Furs 2 of Cardiff, NJ, donated bird feeder items, valued at \$175. The items were used by the Friends of Forsythe group as prizes during National Wildlife Refuge Week.

Cox Carpet Mill of Egg Harbor Twp., NJ donated carpeting, valued at \$82 for use by AmeriCorps members as part of a "migration game."

## I. EQUIPMENT AND FACILITIES

### 2. Rehabilitation

In January a new burglar and fire alarm system was installed at the Brigantine Division Headquarters and Maintenance facilities.

### 3. Major Maintenance

In February, refuge personnel and Americorps members tore down the eastern most billboard on Bonnet Island.

### 6. Computer Systems

Both Brigantine and Barnegat Divisions are "networked". Brigantine has a true network, with a desktop computer operating as our server. Barnegat has a network modem which allows them to share an Internet connection and files.

All refuge staff have access to a computer and have email accounts. Several printers, including a Canon color printer, are available through the network to all staff in the Brigantine HQ building.

A "public" drive has been created on our server computer to serve as a storage area for files that are accessible by all computers at the Brigantine Division. This allows us to share data and provide files for review without having to copy to disks or print hard copies.

### 8. Other

A new scanner that has the capability to scan slides was purchased. This will allow refuge staff to scan old slides and incorporate them in our web site and for use in other media.

A new digital camera was also purchased for each division to allow photographs to be taken and printed on our color printer. These digital photographs are also easily incorporated into our web site and are great for providing photographs to newspaper reporters looking for photos to include with their stories.

## **J. OTHER ITEMS**

### **4. Credits**

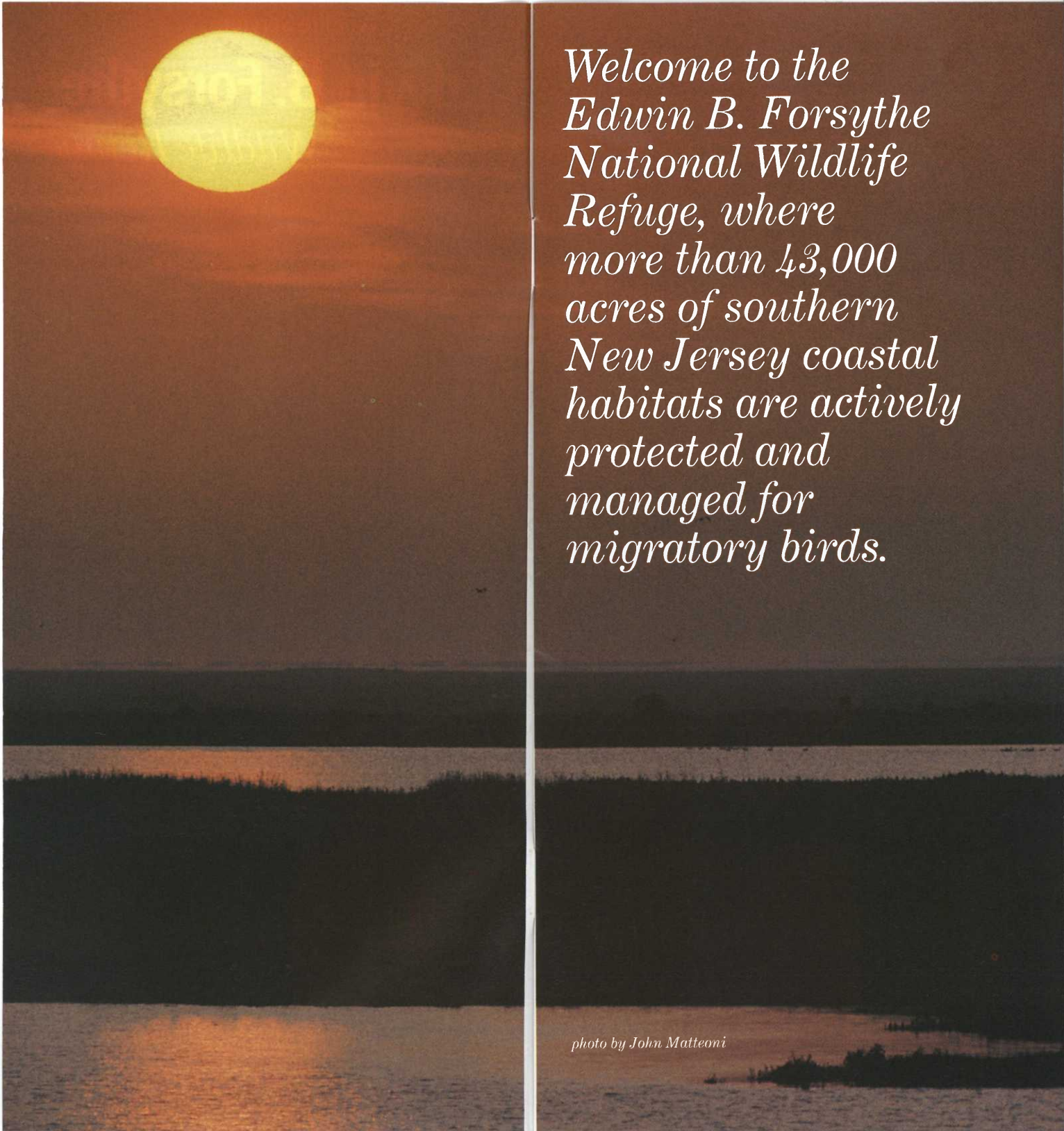
Steve Atzert prepared sections A., C. 1, and 2, D. 1, 3, and 4, and F. 12. Deb Long prepared sections E. 1, 6, and 8, and I. 2, and 3. Jorge Coppen prepared sections B., D.2 and 5, F.1, 2, 3, 5, and 10, and G. 1, 3, 4, 6, 7, 8, 10, 14, 15, 16, and 17. Vinny Turner prepared sections D. 6, F. 2, 5, and 9, G. 2, 5, and 9, and H. 10. Sandy Perchetti prepared sections E. 3 and 4 and H.18. Marty Hand prepared sections E. 5 and I. 6. Cindy Heffley prepared sections H. 2, 4, 5, 6, and 7. Brian Willard prepared section H. 17.

## **K. FEEDBACK**

U.S. Fish & Wildlife Service

**Edwin B. Forsythe**  
*National Wildlife Refuge*





*Welcome to the  
Edwin B. Forsythe  
National Wildlife  
Refuge, where  
more than 43,000  
acres of southern  
New Jersey coastal  
habitats are actively  
protected and  
managed for  
migratory birds.*

*photo by John Matteoni*

## Overview

Forsythe Refuge's Brigantine and Barnegat Divisions were originally two distinct refuges, established in 1939 and 1967 respectively, to protect tidal wetland and shallow bay habitat for migratory water birds. In 1984 they were combined under the Edwin B. Forsythe name, in honor of the late conservationist Congressman from New Jersey.

The refuge's location in one of the Atlantic Flyway's most active flight paths makes it an important link in the vast network of national wildlife refuges administered nationwide by the U.S. Fish and Wildlife Service. Its value for the protection of water birds and their habitat continues to increase as people develop the New Jersey shore for our own use.



© Clay Myers

*Atlantic brant*

## Wildlife and Habitats... Diversity is Critical

New Jersey coastal wetlands have long been the preferred habitat of large numbers of Atlantic brant and the American black duck—a species which has suffered major population declines over the years.

While the refuge's primary concern is to meet the habitat needs of these two species, we manage refuge habitats to support a wide variety of water birds and other wildlife. Special emphasis is also placed on protection and habitat management for the endangered and threatened bird species which nest here.

## Marshes and Water Birds

More than 80 percent of Forsythe Refuge is tidal salt meadow and marsh, interspersed with shallow coves and bays. These are important resting and feeding habitats, as abundant marsh plants provide food and cover for water birds and other wildlife. The quiet tidal waters serve as nurseries, spawning and feeding grounds for fish and shellfish which are important in the diets of many wildlife species—and of people!

At the Brigantine Division, refuge staff have used the management technique of "diking" to create 1,415 acres of impounded fresh- and brackish-water marsh habitat in the heart of naturally occurring tidal salt marsh. We created these wetlands to support a wider variety of wildlife than could native salt marsh alone. Water levels in the impoundments are managed to enhance the resources on which wildlife depend. In spring, refuge staff draw the water down to maximize growth



*Great blue heron*

© Clay Myers

of plants beneficial to waterfowl. The drawdown also provides mud flat feeding habitat for shorebirds and wading birds. We reflood the impoundments just in time for the arrival of fall migrants.

Each spring and fall tens of thousands of migrating ducks and geese, wading birds and shorebirds concentrate here. They linger to rest and feed on the rich resources provided by our managed impoundments, thus providing Wildlife Drive visitors with spectacular viewing and photo opportunities. Several migratory species, including the black duck, remain at the refuge through summer to nest and raise their young. Atlantic brant and black ducks also overwinter here.

Peregrine falcons and ospreys frequent refuge wetlands and take advantage of the nesting platforms erected for their use.

Bald eagles use refuge habitats along the Mullica River, and occasionally forage over refuge impoundments.



*Osprey*

© Clay Myers

### **Barrier Beaches and Endangered Beachnesters**

More than 6,000 acres of the refuge are designated as a National Wilderness Area. This includes Holgate and Little Beach, two of the few remaining undeveloped barrier beaches in New Jersey. They provide essential nesting and feeding habitat for the rare piping plover, black skimmer and least tern. These birds, along with other beach-nesting species, have suffered drastic population declines as human beach developments and recreational uses have eliminated the habitat they need. Forsythe Refuge is one of their last strongholds.

The dunes, prime nesting habitat, constantly shift and change as the forces of wind and wave action mold them. Beach grasses, which trap blowing sand and stabilize the dunes, provide important cover for wildlife, especially developing young birds. Use by humans and their pets can result in severe erosion, loss of habitat, and harm to beach-nesting birds.

The refuge manages its fragile beach areas for the rare birds which depend on them. In order to minimize disturbance to the birds and their habitat, this management includes limiting or prohibiting public access. Holgate is closed to all public use during nesting season; Little Beach is closed all year except by special use permit for research or education.

### **Forests, Swamps and Fields**

Almost 5,000 acres of the refuge are woodlands dominated by such tree species as pitch pine, oaks, and white cedar. Fields are maintained in the midst of these wooded communities to provide habitat for grassland-nesting birds, and to increase habitat diversity.

A wide variety of upland wildlife species, including songbirds, woodcock, white-tailed deer and box turtles, frequent these upland areas. Waterfowl such as black ducks often nest here.



© Clay Myers

*Woodcock*

### **Enjoying the Refuge**

Visitors enjoy a wide range of wildlife-dependent activities at Forsythe Refuge.

### **Wildlife Observation, Photography and Nature Study**

#### *At the Brigantine Division*

Most of the refuge's public use facilities are located at the Brigantine Division headquarters area in Oceanville, open daily sunrise to sunset. This site provides exceptional wildlife viewing, photography, and environmental education opportunities. Accessible rest rooms are available.

#### *Wildlife Drive:*

A leisurely eight-mile drive through wetlands and woodlands reveals wildlife visible from the roadway. Look for spectacular concentrations of migratory water birds in spring and fall, as they stop and linger in refuge habitats managed to meet their needs.

#### *Nature Trails:*

A quiet foot traveler may see a variety of wildlife along these tranquil paths. Take time to notice the beauty of a wildflower, a butterfly feeding, the hoofprint of a deer . . .

*Leeds Eco-Trail:* A scenic half-mile loop foot path through saltmarsh and woodlands offers visitors a chance to view "life on the edge" of these two interesting habitats. Marsh segments of the trail are boardwalked, and the first 700 ft. is accessible to persons in wheelchairs.

*Akers Woodland Trail:* A quarter-mile easy walking path through native woodlands provides many seasonal opportunities to see migrating warblers.

*Headquarters and Auditorium:* The refuge headquarters building contains information and staff offices. An auditorium offers an interesting array of seasonally changing wildlife displays.

*Self-Service Visitor Information Area:* Provides brochures, as well as wildlife sightings and other important information.

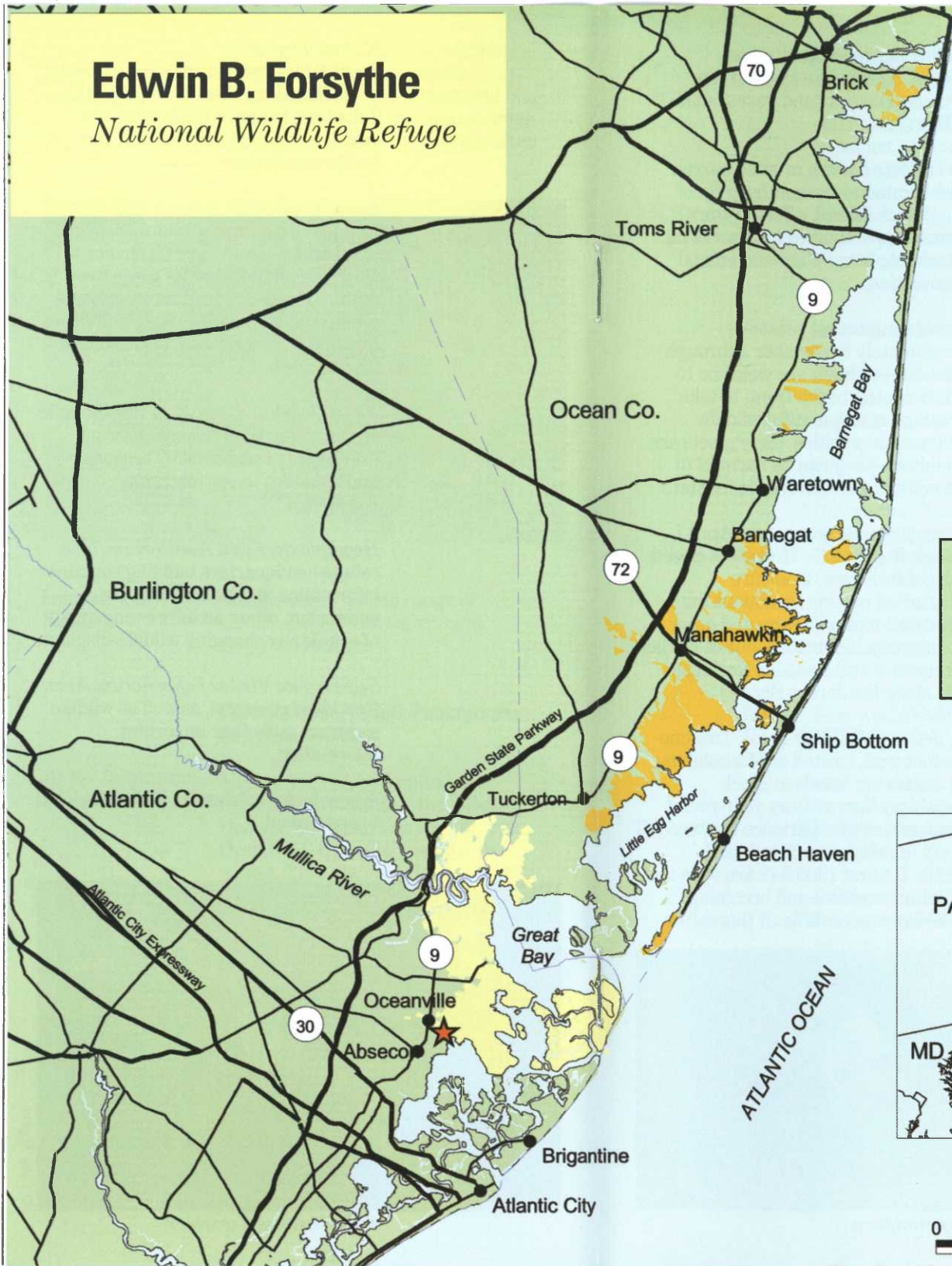
A new Refuge Sales Outlet is scheduled to open soon!



© Clay Myers

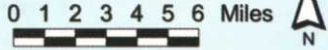
*Yellow-rumped warbler*

# Edwin B. Forsythe *National Wildlife Refuge*



**LEGEND**

- ★ Refuge Headquarters
- Orange Barnegat Division
- Yellow Brigantine Division



### ***At the Barnegat Division***

Wildlife viewing opportunities are seasonal in some areas of the Barnegat Division, and year-round in others.

*The Holgate Unit:* a pristine barrier beach located at the southern tip of Long Beach Island, offers visitors seasonal opportunities to observe its remarkable living plant and animal communities.

During non-nesting season—approximately September 1 through March 31—visitors are welcome to walk Holgate's beach front, to take advantage of its plentiful wildlife viewing opportunities. (Sorry, pets are prohibited—they can be harmful to both wildlife and this fragile habitat.)

During the nesting season—April 1 through August 31—Holgate is closed to all public access, to ensure undisturbed nesting conditions for threatened piping plovers and other beachnesters. (Holgate is one of the last nesting sites still available for these birds along the Jersey Shore.)

*The deCamp Wildlife Trail:* This one-mile foot trail, located at Mantoloking and Adamston Roads in Brick Township, offers visitors year-round opportunities to experience the tranquil beauty of refuge woodlands and wildlife. Its first 1300 feet are wide and flat, with benches—and becoming moderately more difficult thereafter.



*Common tern*

*Barnegat Observation Platform:* Starting in 1999 visitors will be able to glimpse migratory water birds feeding and resting in the refuge's 600-acre Barnegat impoundment. At that time construction of a universally accessible observation deck will be completed on Bay Shore Drive between Ridgeway and Edison Avenues, east of Route 9. We are pleased to provide this new birding opportunity to refuge visitors.

### **Hunting, Fishing, and Crabbing**

Seasonal waterfowl and deer hunting, fishing, and crabbing are permitted in designated areas of both the Brigantine and Barnegat Divisions, under Federal and State regulation. Boats may be launched at the Brigantine Division's Scotts Landing boat ramp, located at the end of Scotts Landing Road, off Moss Mill Road, at Leeds Point.

Please contact refuge headquarters for additional information, regulations and maps.

**Note:** Best wildlife viewing occurs in spring and fall.

Bird checklists, Wildlife Drive brochures, and a leaflet describing Holgate's seasonal regulations are available.

Biting insects abound from mid-May through mid-October. Ticks occur all year, and are most active during warmer months. Some ticks may carry Lyme disease, known to be harmful to humans. Insect repellent and other safety precautions are recommended.

## Important Information for Visitors

The refuge receives more than 200,000 visits each year. Cumulative impacts of this many visits on wildlife and habitat can be great. To ensure that we may continue to fulfill our primary mission of protecting and managing this refuge to support wildlife for the benefit of present and future generations of people, visitors must comply with these simple guidelines and regulations.

The refuge's public use areas are open only during daylight hours (sunrise to sunset).

Visitors are urged to remain on designated roads and trails, leaving adjacent habitat undisturbed for use by wildlife.

Headquarters entrance road and Wildlife Drive speed limit is 15 mph or less, as posted.

Pets must be on a short, handheld leash at all times where permitted.

Pets are prohibited at Holgate.

Disturbing, injuring destroying, collecting of plants, wildlife or other natural objects.

Feeding wildlife.

Picking fruits or flowers.

Entering closed areas.

Use of bicycles or motorized vehicles on trails.

Camping, swimming, kite-flying, fires.

Horses, off-road vehicles, unregistered motorized vehicles.

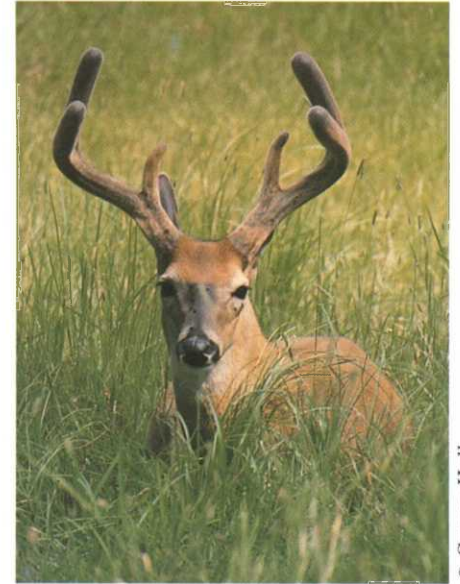
*The following are prohibited on the refuge:*

## A Guide to Seasonal Wildlife Activity

Although migratory and other seasonal wildlife events are described below by month for easy reference, actual timing can vary from year to year due to weather conditions and other factors.

### *Year-round*

White-tailed deer and other resident species may be visible in refuge habitats in virtually any season.



© George Hall

*White-tailed deer in velvet*

### *January and February*

Limited wildlife visibility. Best during thaws. Possible sightings of black ducks, snow geese, Atlantic brant, diving ducks, raptors (perhaps a bald eagle). Cold weather may freeze refuge waterways, forcing waterfowl southward to find open water. The season's first killdeers and red-winged blackbirds may arrive in February.



© George Hall

*Red-winged blackbird*



*Cedar waxwings*

*March 20 to April 15*

Northbound waterfowl migration. Spring peepers and other frog species begin their courtship calls in freshwater wetlands. Beach-nesting birds, including piping plovers, arrive on refuge beaches. (Holgate closes to all public entry April 1.)

*April 20 to May 30*

Wading birds and shorebirds begin to arrive; glossy ibis numbers peak in late April. Canada geese hatch (goslings usually feeding on refuge dikes by May 20).

*Early May*

Greatest diversity and peak numbers of warblers in refuge uplands, coinciding with the seasonally increasing insect populations which are a major part of their diet.

*May and June*

Horseshoe crabs spawn on refuge bay shores and beaches. Migrating ruddy turnstones arrive to forage on the crab eggs. Turtles may be seen laying eggs in the soft dirt along refuge roadways, or sunbathing on roads and wetland edges. Drive carefully.

*Mid-June to Mid-July*

Peak of duckling hatch. These young birds will migrate with adults this fall.

*August*

Best opportunities to see shorebirds and warblers heading south. Wading birds gather for migration.

*September*

Ducks gather in large flocks. Blue-winged teal will be the first to migrate this month.

*October*

Snow geese begin to arrive in refuge wetlands.

*Early November*

Spectacular concentrations of ducks and geese in refuge impoundments; numbers can exceed 100,000!

*Mid-November through December*

Peak snow goose and Atlantic brant numbers. Ducks and geese moving south. Bald eagle sightings most likely in December.



*Snow goose*

## Friends Groups

"Friends" groups help national wildlife refuges protect and manage wildlife for future generations. Want to help? Join the Friends of Forsythe!

A Friends of Forsythe National Wildlife Refuge group is now forming. For information, write Friends of Forsythe NWR, P.O. Box 355, Oceanville NJ 08231, or phone 609/641 4671.



*Piping plover chick*

U.S. Fish and Wildlife Service

## Refuge Entrance Fees—Enacted to Help Wildlife

In response to the staggering loss of wetlands in the United States, in 1986 Congress authorized the U.S. Fish & Wildlife Service to charge entrance fees at some national wildlife refuges. The monies are used to support refuge operations—especially wildlife-dependent public uses—and to purchase wetlands for inclusion into the refuge system.

Entrance fees are in effect every day at Forsythe Refuge's Wildlife Drive, and the foot trails associated with it. Refuge officers routinely conduct compliance checks, and individuals entering the refuge without a valid entrance pass will be cited.

### *Daily Pass*

Payment of the daily fee is on the honor system, and visitors may pay at either of two self-service payment sites.

### *Annual Passes*

Visitors may stop at refuge headquarters (open weekdays 8 am –

4 pm) to purchase any one of three annual passes: a Duck Stamp, a Golden Eagle Passport, or a Forsythe Refuge-specific pass. (Sorry, passes may NOT be ordered or sent by mail.)

### *Lifetime Passes*

Persons 62 or older may pay a one-time fee to receive a Golden Age Passport. Individuals with permanent disabilities may receive a free Golden Access Passport. (Because of the special nature of lifetime passes, qualified individuals must apply in person.)

Any of the above passes will admit the pass holder and others accompanying in a private vehicle. Children under 16 are admitted free. Bus and large-van rates are available. A brochure describing entrance fee options is available.

Remember, your entrance fees help to protect wetlands, support refuge management programs for wildlife, and wildlife-dependent recreational opportunities for you!



*Great egret*

© John Matteoni

Edwin B. Forsythe National Wildlife Refuge  
Great Creek Road  
P.O. Box 72  
Oceanville, NJ 08231  
Telephone: 609/652 1665  
Fax: 609/652 1474

Internet: <http://forsythe.fws.gov>  
E-Mail: [forsythe@fws.gov](mailto:forsythe@fws.gov)

Hearing impaired visitors may call the New Jersey Relay Center at 1 800/852 7899 TDD/1 800 852 7897 voice.

U.S. Fish & Wildlife Service  
1 800/344 WILD  
<http://www.fws.gov/>

Photo © Clay Myers

July 2000



# Edwin B. Forsythe

## *National Wildlife Refuge*

### *Self Guiding Wildlife Drive*

*Watch for ducks  
“tipping up” as  
they reach down to  
feed on aquatic  
plants.*

#### **Habitat for Wildlife**

Forsythe National Wildlife Refuge includes more than 40,000 acres of coastal habitat which is protected and managed for migratory birds. While many plants and animals benefit from refuge management, the habitat needs of American black ducks and Atlantic brant are of special concern. Both species depend heavily on New Jersey's remaining coastal habitat for their survival.

#### **View from the Drive**

A leisurely trip along this self-guiding tour route will take you through refuge wetlands and uplands, where you may observe and photograph migratory birds and other wildlife from the roadway.

Although refuge habitats may appear untouched, they are actually managed to support a wide variety of native plants and animals. During your tour of the Wildlife Drive, you may see refuge staff members at work. Stops described in this brochure will help you better understand both refuge resources and management activities.

#### **Drive Tips**

- **Open:** Daily, sunrise to sunset
- **Speed Limit:** 15 mph or less (as posted)
- **Length:** Eight-mile loop
- **Direction:** One way. Only Gull Pond and entrance are two way.
- **Stopping:** When stopping to observe wildlife, pull well to one side of the road and leave your car door closed so others may pass. Please **DO NOT** park and leave your car along the Wildlife Drive.

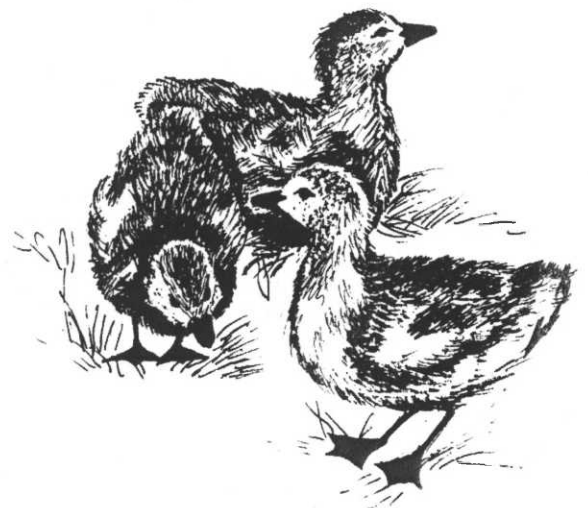
- **Orientation:** Numbered paragraphs in this brochure correspond to stops along the Drive. The brochure map may help orient you to your location as you reach each stop.
- **Seeing Wildlife:** Opportunities are best when you remain in your car, concealed from the wildlife you wish to observe.

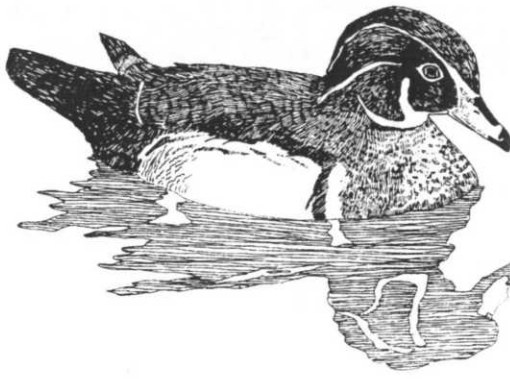
#### **Diking to Create Wetland Diversity**

1. You are driving onto the South Dike, constructed over an old railroad bed which once connected Brigantine Island to the mainland. It is now the southern wall of a dike system which contains two pools of water—one fresh and one brackish—surrounded by the saltmarsh, visible on your right. These diverse wetlands support a wider range of wildlife than the saltmarsh habitat would by itself.

#### **The West Pool—A Freshwater Oasis for Wildlife**

2. Fresh water is a critical resource in the saltmarsh environment. The 900-acre pool to your left is





specifically managed to attract and support a wide variety of migratory water birds. Each year waterfowl, wading birds, and shorebirds use this site for resting, bathing, drinking, and feeding.

Look here for freshwater-loving birds, such as wood ducks, during spring and fall migrations. In fall and winter spectacular flocks of Atlantic brant fly in daily from nearby salt bays to drink and wash salt residues from their feathers.

#### **Managing Pool Water Levels to Maximize Plant Growth**

3. Pool water levels are periodically changed to produce abundant wildlife food plants which grow on the muddy bottom, and to meet other habitat requirements of wetland mammals and migratory birds. Water depth is regulated by water control structures along the dikes.

Watch for ducks “tipping up” as they reach down to feed on aquatic plants. This impoundment receives its heaviest wildlife use in the fall, when waterfowl linger here to feed on the plentiful spikerush before heading south for the winter.

#### **Turtle Cove and the Saltmarsh: Saltwater and Tides**

4. In contrast to the relatively constant water levels maintained in the pools, the tidal waters in the saltmarsh and Turtle Cove flow in and out twice each day. Water levels fluctuate up to two feet at each tide.

Low tides expose the muddy channel bottoms in the saltmarsh, inviting shorebirds to probe for tiny food organisms. At high tide, water at the marsh edge may be deep enough to attract diving birds.

Watch for horseshoe crabs spawning at Turtle Cove in May and June, and for shorebirds that come to feed on crab eggs.

Overwintering brant visit this area to pick up sand or grit, which they retain in their gizzards to grind food.

To reduce disturbance to the wildlife that use this area, the Turtle Cove shoreline is closed to public access.

#### **View from South Tower: Wetlands and More Wetlands**

5. Here you can observe the varied wetland habitats created by diking and water management. Each spring and fall, thousands of migrating water birds come here to rest and feed. They are attracted by the water and food plants found in these diverse marshlands.

In late fall and winter, look for great dark flocks of Atlantic brant wheeling over distant salt bays, and for large concentrations of black ducks in the pools. Tens of thousands of snow geese rest and feed in the saltmarsh and pools in November and early December.

#### **The East Pool: A Brackish-Water Feeding Ground for Shorebirds**

6. The 700-acre impoundment to your left contains shallow brackish water—a mixture of salt and fresh. Managed to meet the needs of many wildlife species, this pool is a popular shorebird foraging area. Water and salinity levels are maintained here to support the rich diversity of invertebrates important in the diets of many shorebirds.

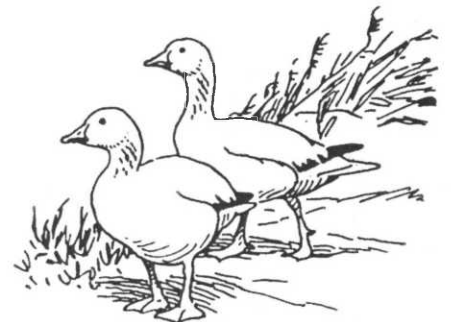
Look for sandpipers and plovers along the muddy edges of the East Pool from August through early September; when large flocks come in to comb these mud flats in search of food.

#### **Habitat Management Techniques Yield Vital Nesting Habitat**

7. Islands in the East Pool are managed to provide nesting and brood-rearing habitat for black ducks and other species which use this area. Seasonal mowing of dike edges promotes growth of native plants used as wildlife food and nest cover.

Refuge managers use controlled burning to reduce the large accumulations of flammable plant debris which occur on pool edges and islands each year. This management technique yields many of the same benefits as mowing.

In spring, look here for blackened burn areas turning green with lush new growth. Watch for goslings starting in May and for ducklings beginning in mid-June.



### Sounds of the Marsh

8. From late April through September, listen here for the clattering call of the clapper rail, one of the more reclusive saltmarsh residents. This hen-like, gray-brown water bird stalks marsh edges for fiddler crabs and other mud-dwelling prey.

### Those Ditches in the Pools are Important to Wildlife

9. Ditches in the pools are actively maintained to provide deeper water in which fish and tiny invertebrates can thrive. These species are important in the diets of wading birds and developing young waterfowl.

Ditches also promote more efficient pool water circulation. Good circulation helps increase oxygen levels and reduces summer water temperatures in the pools, thus lessening wildlife disease risks.

### Saltmarsh Eatouts

10. The large, muddy areas visible to your right as you drive this dike have been created by thousands of snow geese that stop here each fall to rest and feed. While some species eat only the tips of marsh grasses, snow geese have an appetite for the roots. Once they have uprooted and eaten the grasses in an area, they move on, leaving a muddy "eatout" behind.

### Refuge Uplands: Forest and Field

11. You have just entered refuge uplands. In order to increase habitat diversity for wildlife, fields are maintained in the midst of naturally occurring forest. Many animal species thrive along the woodland/field edge, feeding in one habitat and using the other for cover and nesting.

Field vegetation changes are controlled by periodic mowing. If these grassy areas were left unmanaged, the natural process of plant succession would ultimately transform them into forests.

Upland edge dwellers such as deer, rabbits, and songbirds are frequently visible from the road. Watch also for Canada geese grazing in the fields.

### Fire Lanes, Wildlife and People

12. Most refuge upland areas are closed to public access to minimize disturbance to habitat and wildlife. Fire lanes or breaks have been cut through these uplands, however; to help prevent wildfires from spreading and to provide access for refuge management purposes.

Fire lanes are not maintained for public use. While foot travel is permitted on some of them, most are closed to all public entry. Visitors are cautioned not to enter fire lanes posted with "Area Closed" signs.

Foot travelers are reminded that biting flies and ticks abound, and that ticks may transmit Lyme disease—known to be harmful to humans. While biting flies are active mostly in the warmer months, ticks may be active all year.

### Fighting Fire with Fire

13. In 1965 a raging wildfire destroyed most of the vegetation in this area. Today, wildlife managers use controlled burning to reduce the buildup of flammable plant debris that might otherwise fuel an uncontrollable wildfire. This management technique also increases habitat diversity for wildlife: uplands that are periodically burned support a wider range of plant species at more varied life stages than they would if left unburned.

### Drive's End

14. We hope your visit has been pleasant, and that you have enjoyed this brief glimpse into the interesting work of wildlife management.

Please recycle this brochure by placing it in the container at the end of the Drive. Thank you.

### U.S. Fish & Wildlife Service

Edwin B. Forsythe National Wildlife Refuge is one of 526 refuges in the National Wildlife Refuge System administered by the U.S. Fish and Wildlife Service. The National Wildlife Refuge System is a network of lands and waters managed specifically for the protection of wildlife and wildlife habitat and represents the most comprehensive wildlife management program in the world. Units of the system stretch across the United States from northern Alaska to the Florida Keys and include small islands in the Caribbean and South Pacific. The character of the refuges is as diverse as the nation itself.

The Service also manages national fish hatcheries and provides federal leadership in habitat protection, fish and wildlife research, technical assistance and the conservation and protection of migratory birds, certain marine mammals and threatened and endangered species.

For further information, please contact:

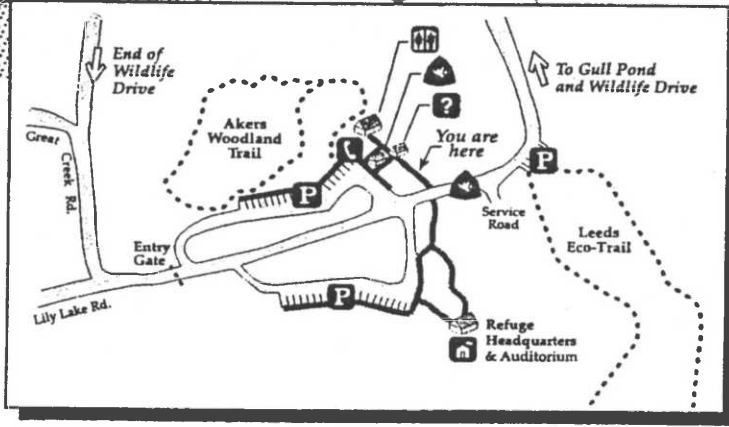
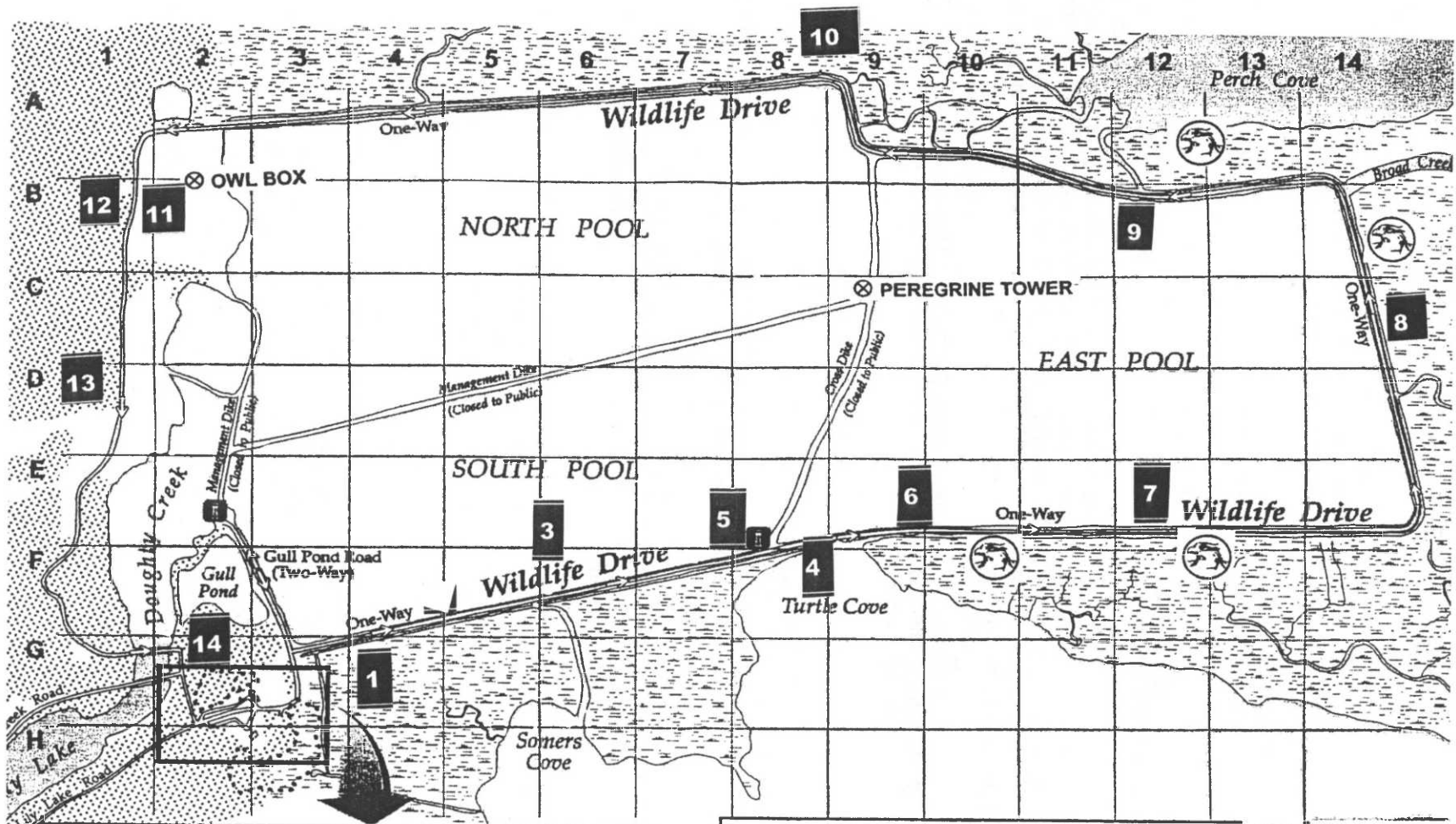
**Edwin B. Forsythe**  
**National Wildlife Refuge**  
**Great Creek Road**  
**P.O. Box 72**  
**Oceanville, NJ 08231-0072**  
**609/652 1665**  
**fw5rw\_fbrnwr@fws.gov**  
**<http://forsythe.fws.gov>**

**Federal Relay Service**  
**for the deaf and hard-of-hearing**  
**1 800/877 8339**

**U.S. Fish and Wildlife Service**  
**1 800/344 WILD**  
**<http://www.fws.gov>**

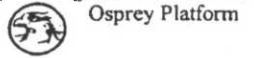
**September 2000**





**LEGEND**

- Refuge Headquarters/ Auditorium
- Telephone
- Parking
- Visitor Information
- Public Restrooms
- Observation Tower
- Entrance Fee Payment Site
- Wildlife Drive
- Pedestrian Walkway
- Nature Trail
- Tidal Salt Marsh
- Forest



## About Our Group

*The Friends of Forsythe NWR is a non-profit group established in 1998 to provide support and services to the Edwin B. Forsythe National Wildlife Refuge in Oceanville, New Jersey.*

### *Our Goals Include:*

- Promoting a better understanding of the natural history and environment of Southern New Jersey, the Edwin B. Forsythe NWR and the National Wildlife Refuge System.*
- Helping to preserve and enhance the wildlife habitat at this Refuge, and to assist the Refuge, the Refuge System and the U.S. Fish and Wildlife Service in a variety of educational and supportive efforts.*

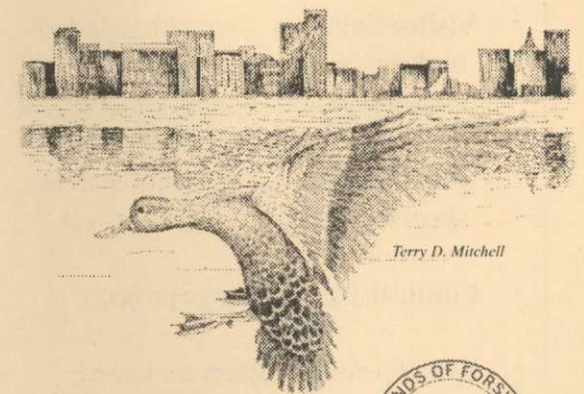
*Join Friends  
and help us  
accomplish  
these goals!*



Terry D. Mitchell

Friends of Forsythe NWR  
P.O. Box 355  
Oceanville, NJ 08231

# FRIENDS *of* FORSYTHE



Terry D. Mitchell



*When we take time to  
see the beauty of the  
world around us, we  
breathe new life into  
ourselves, our world  
and our communities.*

# Membership Opportunities

Please make your check payable to:

## Friends of Forsythe National Wildlife Refuge

### What do Friends do?

- **The Nature Store** is operated by the Friends at the Refuge. Inventory contains a wide range of reading material and other items of interest to both young or old, beginner or advanced wildlife observers!
- **Visitor Services** - providing guided birdwatching & nature walks, assisting visitors through volunteers at the Nature Store and special events, providing support to Refuge staff at special events throughout the year.
- **Fundraising** for Refuge projects.
- **Solicit public support** for issues related to the Refuge and the Friends goals.
- **Encourage the public** to become Friends and to be involved in supporting their local wildlife refuge by contributing their time and skills in whatever method they are able.

### We invite you to join our group.

Your membership/contribution helps support the mission and programs at Forsythe Refuge.

You will also receive the following benefits.

- Our Newsletter.
- 10% discount on purchases at the Friends Nature Store.
- You are invited to the Annual Membership Meeting held in April.
- Your dues and contributions are tax deductible.
- A sense of accomplishment in providing many opportunities for wildlife-related recreation, education and research.
- You are encouraged to become as active as you wish in the group's programs and projects. Please contact us for more information.

Terry D. Mitchell

### Friends of Forsythe NWR

P.O. Box 355, Oceanville, NJ 08231

Phone 609-748-1535

[www.friendsofforsythe.org](http://www.friendsofforsythe.org)

New members are always welcome in our Friends Group. Many projects are planned and your continued support is needed to make those plans a reality. New opportunities for volunteering are open and your participation would be most welcome. Indicate below, your level of membership.

*Thank you!*

- |  |  |   |
|--|--|---|
| <input type="checkbox"/> \$5<br>Duckling<br>(Student/Senior)   | <input type="checkbox"/> \$10<br>Piping Plover<br>(Individual) | <input type="checkbox"/> \$25<br>Black Duck<br>(Family)             |
| <input type="checkbox"/> \$50<br>Brant<br>(Group)              | <input type="checkbox"/> \$100<br>Tundra Swan<br>(Supporter)   | <input type="checkbox"/> \$250<br>Peregrine Falcon<br>(Corporate I) |
| <input type="checkbox"/> \$500<br>Bald Eagle<br>(Corporate II) |  |   |

Name \_\_\_\_\_

Address \_\_\_\_\_

City/State/Zip \_\_\_\_\_

Phone and/or email \_\_\_\_\_



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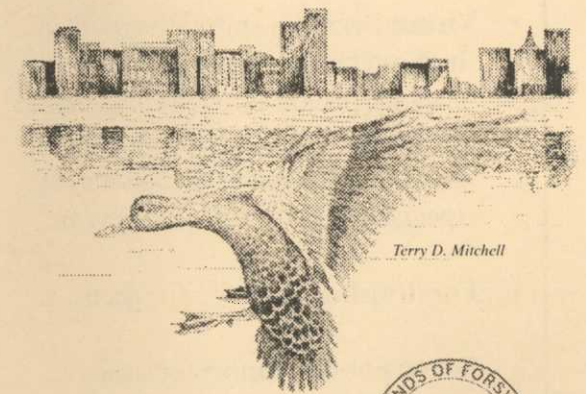
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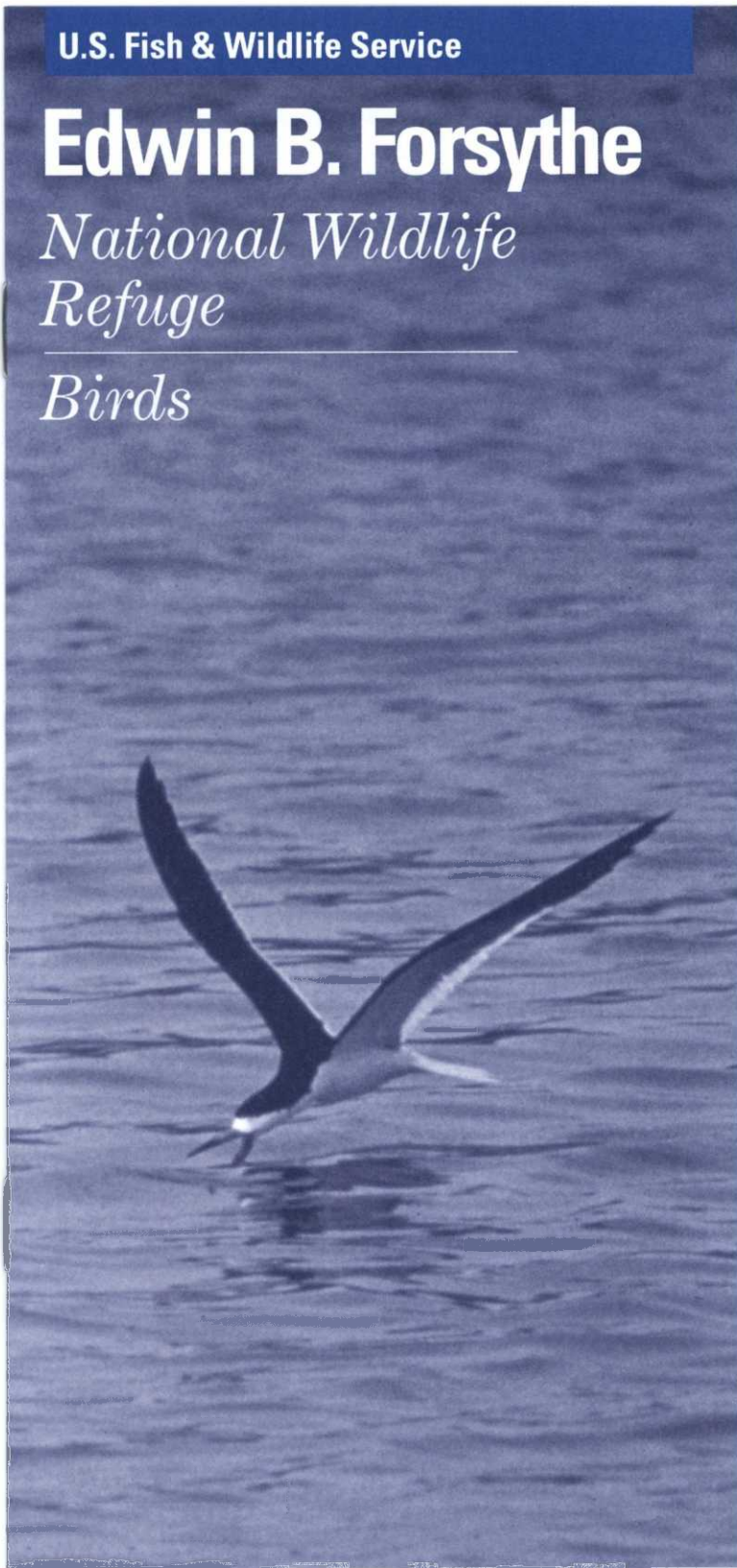
U.S. Fish & Wildlife Service

# Edwin B. Forsythe

*National Wildlife  
Refuge*

---

*Birds*



**Introduction**

*The Edwin B. Forsythe National Wildlife Refuge contains more than 43,000 acres of southern New Jersey coastal habitat. At the Brigantine Division, our renowned Wildlife Drive takes visitors through wetland and upland habitats. A description of other refuge wildlife viewing sites and a "Guide to Seasonal Wildlife Activity" are available in the refuge's general brochure. Best birdwatching opportunities occur during spring and fall migrations.*

*Common yellowthroat/George Hall*



**Notes**

Location \_\_\_\_\_

Date \_\_\_\_\_ Time \_\_\_\_\_

Observers \_\_\_\_\_

Weather \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

This folder identifies 293 species that have been observed at the Brigantine and Barnegat Divisions. Names and order of listing are in accordance with the Sixth American Ornithologists' Union Checklist.

Most birds are migratory. Their seasonal occurrence is coded as follows:

**Season**

s	spring	March – May
S	summer	June – August
F	fall	September – November
W	winter	December – February

- Birds known to nest on or near the refuge  
*Italics indicate threatened/endangered species*

**Relative Abundance**

Relative abundance indicates how frequently you might see a bird in its favored habitat.

a	abundant	a species which is very numerous
c	common	likely to be seen or heard in suitable habitat
u	uncommon	present, but not certain to be seen
o	occasional	seen only a few times during a season
r	rare	may be present but not every year
x		accidental seen only once or twice on refuge



*Snow geese/Maurice Tremblay*

	s	S	F	W
<b>LOONS – GREBES</b>				
___ Red-throated Loon .....	o		o	u
___ Common Loon .....	o	r	o	o
___ Pied-billed Grebe .....	u	o	u	o
___ Horned Grebe .....	u		u	u

**SHEARWATERS – PELICANS – CORMORANTS**

___ Sooty Shearwater .....	r	r		
___ Northern Gannet .....	r	r	u	
___ American White Pelican .....	r			r
___ Brown Pelican .....		u		
___ Great Cormorant .....				r
___ Double-crested Cormorant .....	u	o	c	u

**BITTERNS – HERONS – IBISES**

___ • American Bittern .....	u	o	u	u
___ • Least Bittern .....	u	u	u	
___ • Great Blue Heron .....	c	c	c	u
___ • Great Egret .....	c	c	c	o
___ • Snowy Egret .....	c	c	c	o
___ • Little Blue Heron .....	u	u	u	o
___ • Tricolored Heron .....	u	u	u	o
___ • Cattle Egret .....	u	u	u	
___ • Green-backed Heron .....	u	u	u	
___ • Black-crowned Night-Heron .....	u	u	u	u
___ • Yellow-crowned Night-Heron .....	o	o	o	
___ White Ibis .....		r	r	
___ • Glossy Ibis .....	a	a	o	o
___ • White-faced Ibis .....		x		

**SWANS – GEESE – DUCKS**

___ Tundra Swan .....	o		u	o
___ • Mute Swan .....	c	c	c	u
___ Greater White-fronted Goose .....			o	o
___ Snow Goose .....	a	o	a	a
___ Ross' Goose .....			r	r
___ Brant .....	a	o	c	c
___ • Canada Goose .....	c	c	c	c
___ • Wood Duck .....	u	o	u	r
___ • Green-winged Teal .....	c	o	a	c
___ • American Black Duck .....	a	c	a	a
___ • Mallard .....	c	u	c	o
___ • Northern Pintail .....	c	o	a	u
___ • Blue-winged Teal .....	c	u	a	o
___ • Northern Shoveler .....	c	o	c	c
___ • Gadwall .....	c	c	c	u
___ Eurasian Wigeon .....			r	r
___ American Wigeon .....	c	o	c	o
___ Canvasback .....	o		o	r
___ Redhead .....	o		o	r

	s	S	F	W
___ Ring-necked Duck .....	o		o	o
___ Greater Scaup .....	c		c	u
___ Lesser Scaup .....	o		o	o
___ Oldsquaw .....	u		u	u
___ Black Scoter .....	u	r	u	u
___ Surf Scoter .....	u	r	o	u
___ White-winged Scoter .....	u	r	u	u
___ Common Goldeneye .....	u		u	u
___ Bufflehead .....	c	o	c	c
___ Hooded Merganser .....	c	r	u	u
___ Common Merganser .....	o		o	o
___ Red-breasted Merganser .....	u	r	u	u
___ • Ruddy Duck .....	u	u	u	o

**VULTURES – HAWKS – FALCONS**

___ Turkey Vulture .....	o	o	o	r
___ • Osprey .....	u	u	u	
___ <i>Bald Eagle</i> .....	o	o	o	o
___ • Northern Harrier .....	u	o	u	u
___ Sharp-shinned Hawk .....	o		u	o
___ Cooper's Hawk .....	o		o	r
___ Northern Goshawk .....			r	r
___ Red-shouldered Hawk .....	o	r	o	r
___ • Broad-winged Hawk .....	o	o	o	
___ Red-tailed Hawk .....	o	o	u	o
___ Rough-legged Hawk .....	o		o	u
___ Golden Eagle .....	r		r	r
___ • American Kestrel .....	u	u	u	o
___ Merlin .....	o		u	o
___ • Peregrine Falcon .....	u	u	u	u
___ Gyrfalcon .....		x		

**GROUSE – QUAIL – TURKEY**

___ Ring-necked Pheasant .....	r	r	r	r
___ • Ruffed Grouse .....	o	o	o	o
___ Wild Turkey .....	u	u	u	u
___ • Northern Bobwhite .....	u	u	u	u

**RAILS – CRANES**

___ Yellow Rail .....	r	r	r	
___ Black Rail .....	r	r	r	
___ • Clapper Rail .....	c	c	c	o
___ King Rail .....	o	o	o	r
___ • Virginia Rail .....	u	u	u	o
___ • Sora .....	u	u	u	r
___ • Common Moorhen .....	o	o	o	
___ • American Coot .....	u	o	u	u

**PLOVERS – SANDPIPERS**

	s	S	F	W
___ Black-bellied Plover .....	c	o	c	o
___ Lesser Golden-Plover .....	r		o	
___ Semipalmated Plover .....	u	u	c	r
___ • Piping Plover .....	u	u	o	
___ • Killdeer .....	u	u	u	r
___ • American Oystercatcher .....	o	u	u	r
___ Black-necked Stilt .....	o		o	
___ American Avocet .....	o	o	o	r
___ Greater Yellowlegs .....	c	u	c	u
___ Lesser Yellowlegs .....	u	o	c	r
___ Solitary Sandpiper .....	o	o	o	
___ • Willet .....	c	a	u	r
___ • Spotted Sandpiper .....	u	o	u	
___ Upland Sandpiper .....			x	
___ Whimbrel .....	u	o	u	o
___ Black-tailed Godwit .....		x		
___ Hudsonian Godwit .....		o	o	
___ Bar-tailed Godwit .....		x		
___ Marbled Godwit .....		o	o	r
___ Ruddy Turnstone .....	c	o	c	r
___ Red Knot .....	o	u	u	
___ Sanderling .....	c	o	c	o
___ Semipalmated Sandpiper .....	a	a	a	o
___ Western Sandpiper .....	u	u	e	o
___ Least Sandpiper .....	a	u	c	o
___ White-rumped Sandpiper .....	o	o	o	
___ Baird's Sandpiper .....			r	
___ Pectoral Sandpiper .....	o	o	u	
___ Purple Sandpiper .....	r		r	
___ Dunlin .....	a	o	a	a
___ Curlew Sandpiper .....	r	r	r	
___ Stilt Sandpiper .....	r	u	u	r
___ Buff-breasted Sandpiper .....		o	o	
___ Ruff .....	r	r	r	
___ Short-billed Dowitcher .....	c	a	c	
___ Long-billed Dowitcher .....	o	o	u	r
___ Common Snipe .....	u	o	u	o
___ • American Woodcock .....	u	o	u	o
___ Wilson's Phalarope .....	r	o	o	
___ Red-necked Phalarope .....		r	o	
___ Red Phalarope .....	r	r	r	

**GULLS – TERNS**

___ • Laughing Gull .....	c	a	c	r
___ Common Black-headed Gull .....	r		r	
___ Bonaparte's Gull .....	o		o	o
___ Ring-billed Gull .....	c	o	u	c

	s	S	F	W
___ • Herring Gull .....	a	a	a	a
___ Iceland Gull .....				x
___ Lesser Black-backed Gull .....	r	r	r	r
___ Glaucous Gull .....	r			r
___ • Great Black-backed Gull .....	c	u	c	c
___ • Gull-billed Tern .....	u	u	u	
___ Caspian Tern .....	r	o	o	
___ Royal Tern .....	o	o	u	
___ Sandwich Tern .....		x		
___ Roseate Tern .....	o	o		
___ • Common Tern .....	c	c	c	
___ • Forster's Tern .....	c	c	c	
___ • Least Tern .....	c	c	o	
___ Black Tern .....		o	o	
___ • Black Skimmer .....	c	c	c	r

**DOVES – OWLS – SWIFTS – HUMMINGBIRDS**

___ Rock Dove .....	o	o	o	o
___ • Mourning Dove .....	c	c	c	c
___ • Black-billed Cuckoo .....	o	o	o	
___ • Yellow-billed Cuckoo .....	u	u	u	
___ • Barn Owl .....	r	o	o	r
___ • Eastern Screech-Owl .....	u	u	u	u
___ • Great Horned Owl .....	u	u	u	u
___ Snowy Owl .....				r
___ Barred Owl .....	r	r	r	r
___ Short-eared Owl .....	u		o	o
___ Northern Saw-whet Owl .....	r		r	r
___ Common Nighthawk .....	o	o	u	
___ Chuck-will's widow .....	u	u		
___ • Whip-poor-will .....	u	u	u	u
___ Chimney Swift .....	o	o	o	
___ Ruby-throated Hummingbird .....	o	o	o	
___ • Belted Kingfisher .....	o	u	u	o

**WOODPECKERS – FLYCATCHERS**

___ Red-headed Woodpecker .....		o	o	
___ Red-bellied Woodpecker .....	o		o	o
___ Yellow-bellied Sapsucker .....	o		o	
___ • Downy Woodpecker .....	u	u	u	u
___ Hairy Woodpecker .....	o	o	o	o
___ • Northern Flicker .....	u	u	c	o
___ • Eastern Wood-Pewee .....	o	o	o	
___ Yellow-bellied Flycatcher .....				r
___ Willow Flycatcher .....	o	r	r	
___ Least Flycatcher .....	o		o	
___ • Eastern Phoebe .....	u	r	u	
___ Great Crested Flycatcher .....	u	u	u	
___ Western Kingbird .....				r
___ • Eastern Kingbird .....	u	u	u	

**LARKS – SWALLOWS – JAYS – CROWS**

	s	S	F	W
___ • Horned Lark .....	u	o	u	u
___ • Purple Martin .....	u	u	u	
___ • Tree Swallow .....	e	e	e	o
___ Northern Rough-winged Swallow .....	o	o	o	
___ • Bank Swallow .....	o	o	o	
___ Cliff Swallow .....	r		r	
___ • Barn Swallow .....	e	e	e	
___ • Blue Jay .....	e	e	e	o
___ • American Crow .....	u	o	u	o
___ • Fish Crow .....	e	e	e	o

**TITMICE – NUTHATCHES – WRENS**

___ Black-capped Chickadee .....	r			r
___ • Carolina Chickadee .....	u	u	u	u
___ • Tufted Titmouse .....	u	u	u	u
___ Red-breasted Nuthatch .....	o		o	o
___ • White-breasted Nuthatch .....	o	o	o	o
___ Brown Creeper .....	o		o	o
___ • Carolina Wren .....	u	u	u	o
___ • House Wren .....	u	u	u	
___ Winter Wren .....	r		r	r
___ Sedge Wren .....	r		r	r
___ • Marsh Wren .....	e	e	e	o

**KINGLETS – THRUSHES – THRASHERS**

___ Golden-crowned Kinglet .....	u		u	o
___ Ruby-crowned Kinglet .....	o		o	o
___ Blue-gray Gnatcatcher .....	u	o	u	
___ Eastern Bluebird .....	r	r	r	r
___ Veery .....	u		o	
___ Gray-cheeked Thrush .....	o		o	
___ Swainson's Thrush .....	u		o	
___ Hermit Thrush .....	u		u	u
___ • Wood Thrush .....	u	o	u	
___ • American Robin .....	e	e	e	u
___ • Gray Catbird .....	e	e	e	r
___ • Northern Mockingbird .....	e	e	e	u
___ • Brown Thrasher .....	u	u	u	r

**WAXWINGS – SHRIKES – STARLINGS**

___ American Pipit .....			o	r
___ Cedar Waxwing .....	o	o	o	o
___ Northern Shrike .....	r		r	r
___ • European Starling .....	a	a	a	o

**VIdeos – WOOD WARBLERS**

___ • White-eyed Vireo .....	u	u	u	
___ Solitary Vireo .....	o		o	
___ Yellow-throated Vireo .....	r		r	

	s	S	F	W
___ Philadelphia Vireo .....				o
___ • Red-eyed Vireo .....	u	u	u	
___ Blue-winged Warbler .....	u	o	u	
___ Golden-winged Warbler .....	r		r	
___ Tennessee Warbler .....	o		r	
___ Nashville Warbler .....	o		r	
___ Northern Parula .....	u	o	u	
___ • Yellow Warbler .....	e	e	u	
___ Chestnut-sided Warbler .....	o		o	
___ Magnolia Warbler .....	u		u	
___ Cape May Warbler .....	o		o	
___ Black-throated Blue Warbler .....	o		o	
___ Yellow-rumped Warbler .....	e		e	u
___ Black-throated Green Warbler .....	o		o	
___ Blackburnian Warbler .....	u		o	
___ Yellow-throated Warbler .....	r			
___ • Pine Warbler .....	u	u	u	r
___ Prairie Warbler .....	e	u	e	
___ Palm Warbler .....	o		o	o
___ Bay-breasted Warbler .....	o		o	
___ Blackpoll Warbler .....	e		e	
___ Cerulean Warbler .....	r			
___ • Black-and-white Warbler .....	e	o	e	
___ American Redstart .....	u		u	
___ Prothonotary Warbler .....	r			
___ Worm-eating Warbler .....	r		r	
___ • Ovenbird .....	u	u	u	
___ Northern Waterthrush .....	u		u	
___ Connecticut Warbler .....	r		r	
___ Mourning Warbler .....	r		r	
___ • Common Yellowthroat .....	e	e	e	r
___ • Hooded Warbler .....	o	o	o	
___ Wilson's Warbler .....	o		o	
___ Canada Warbler .....	u		u	
___ • Yellow-breasted Chat .....	o	o	o	

**TANAGERS – SPARROWS**

___ Summer Tanager .....	r			
___ • Scarlet Tanager .....	u	u	o	
___ • Northern Cardinal .....	e	e	e	e
___ Rose-breasted Grosbeak .....	o		r	
___ Blue Grosbeak .....	o	o	o	
___ • Indigo Bunting .....	o	o	o	
___ Dickcissel .....		x		
___ • Rufous-sided Towhee .....	u	u	u	o
___ American Tree Sparrow .....	u			u
___ • Chipping Sparrow .....	u	u	u	
___ Field Sparrow .....	u	u	u	u
___ Vesper Sparrow .....	r		r	
___ Lark Sparrow .....			r	
___ Savannah Sparrow .....	e		e	o

	S	S	F	W
___ • Grasshopper Sparrow .....	o	o	o	
___ • Sharp-tailed Sparrow .....	c	c	c	o
___ • Seaside Sparrow .....	c	c	c	o
___ Fox Sparrow .....	o		o	o
___ • Song Sparrow .....	c	c	c	c
___ • Swamp Sparrow .....	c	c	u	u
___ White-throated Sparrow .....	c		c	c
___ White-crowned Sparrow .....	o	r	o	r
___ Dark-eyed Junco .....	c		c	u
___ Lapland Longspur .....	r			r
___ Snow Bunting .....	o		r	o

**BLACKBIRDS – FINCHES**

___ Bobolink .....	o	o	u	
___ • Red-winged Blackbird .....	a	a	a	u
___ • Eastern Meadowlark .....	u	u	u	u
___ Yellow-headed Blackbird .....		r	r	
___ Rusty Blackbird .....	r		r	
___ • Boat-tailed Grackle .....	u	u	u	
___ • Common Grackle .....	c	c	c	o
___ • Brown-headed Cowbird .....	c	c	c	o
___ • Orchard Oriole .....	o	o	r	
___ Northern Oriole .....	u	o	o	
___ Purple Finch .....	o		o	o
___ • House Finch .....	o	o	o	o
___ Common Redpoll .....				r
___ Pine Siskin .....	o		o	o
___ • American Goldfinch .....	u	u	u	u
___ Evening Grosbeak .....	o		o	o
___ • House Sparrow .....	c	c	c	c

Great egret, J. Matteoni/USFWS



**U.S. Fish and Wildlife Service**

Edwin B. Forsythe is one of over 500 refuges in the National Wildlife Refuge System administered by the U.S. Fish and Wildlife Service. The National Wildlife Refuge System is a network of lands and waters managed specifically for the protection of wildlife and wildlife habitat and represents the most comprehensive wildlife management program in the world. Units of the system stretch across the United States from northern Alaska to the Florida Keys and include small islands in the Caribbean and South Pacific. The character of the refuges is as diverse as the nation itself.

The Service also manages national fish hatcheries, and provides federal leadership in habitat protection, technical assistance, and the conservation and protection of migratory birds, certain marine mammals and threatened and endangered species.

Please report any sightings of birds which are not included in this list to:

Refuge Manager  
 Edwin B. Forsythe National Wildlife Refuge  
 Brigantine Division  
 Great Creek Road, P.O. Box 72  
 Oceanville, NJ 08231-0072  
 Telephone: 609/652 1665

Hearing impaired visitors may call the New Jersey Relay Center at 1-800/852 7899 TDD/1-800/852 7897 voice.

Black skimmer, J. Gallegos/USFWS



**Edwin B. Forsythe National Wildlife Refuge**  
**Brigantine Division**  
**Great Creek Road, P.O. Box 72**  
**Oceanville, NJ 08231-0072**  
**Telephone: 609/652 1665**  
**Fax: 609/652 1474**  
**Email: FW5RW\_FBRNWR@FWS.GOV**  
**Internet: <http://www.fws.gov/r5ebfnwr>**

**U.S. Fish & Wildlife Service**  
**1 800/344 WILD**

**August 2000**



*Black skimmer, J. Matteoni*



**Visit  
Route 9  
in  
Galloway,  
New  
Jersey**

**Shopping, Golf,  
Antiquing,  
Birdwatching, History,  
Art, Dining**

*including  
Edwin B. Forsythe National  
Wildlife Refuge, Historic  
Smithville, The Noyes Museum,  
and much more along the way*

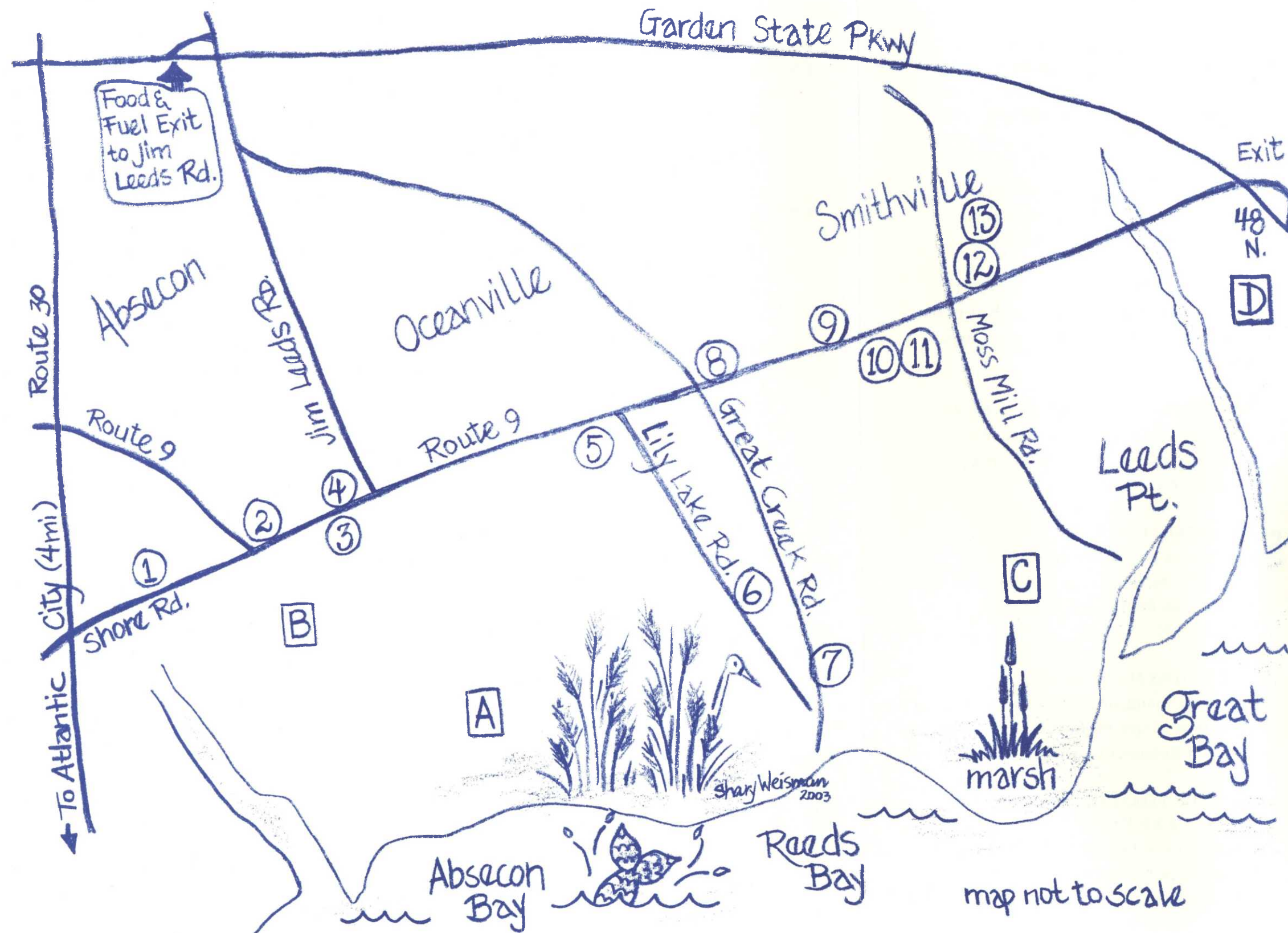
Only 10 minutes from Atlantic City, NJ

**W**elcome to Route 9 in Galloway, New Jersey. This North-South corridor is easily accessible. Highlighted is the popular stretch of road between Exit 48N of the Garden State Parkway to Route 30.

Route 9 Galloway is a great place to visit any time of the year. From the blooming flowers of spring at the wildlife refuge, to the popular Mayfest in Smithville, to the lazy days of summer, the area is minutes from the beaches. Take a swing to the LPGA Golf Tournament at Marriott Seaview Resort in June.

As the days cool, start your holiday shopping at one of the specialty and antique shops. View the spectacular fall bird migration at the Edwin B. Forsythe National Wildlife Refuge. Don't let cabin fever set in. Once the days are short, warm up at one of the bed and breakfasts or inns and visit the Noyes Museum galleries. Have a delicious meal at one of Route 9 Galloway's famous dining spots to top off the day.

Of course, Atlantic City is only minutes away with its round the clock excitement, entertainment and World Famous Boardwalk.



**1** PITNEY HOUSE BED & BREAKFAST  
The historic home of the "Father of Atlantic City"; built - 1799, restored - 1997; National Register of Historic Places. 609-569-1799

**2** ATHENIAN GARDEN  
Authentic Greek Cuisine; Specialties include whole charcoal broiled fish, leg of lamb, kebobs, salads, pasta. 609-748-1818

**3** McGETTIGAN'S 19th HOLE TAVERN  
Daily lunch and dinner specials; complete line of package goods and take-out; party trays; fax 609-652-8475. 609-652-6476

**4** SEAVIEW MARRIOTT RESORT & SPA  
One of the premiere golf destinations; Southern New Jersey's only full service golf resort. 609-652-1800

**5** SEAFARER SHOP LTD  
3,000 Sq. Ft. of gifts, antiques and reproductions, furnishings, home accents and authentic nautical treasures; open daily. 609-652-9491

**6** THE NOYES MUSEUM OF ART  
Open year 'round, the NMA presents changing exhibitions of fine art, folk art and crafts, and a variety of programs for all ages. 609-652-8848

**7** EDWIN B. FORSYTHE NATIONAL WILDLIFE REFUGE  
Wildlife-oriented recreational activities for the whole family; "Wake Up with the Birds!" 609-652-1665

**8** SHEA'S CAFE  
Located in Oceanville Station; serving homemade breakfast and lunch in a friendly atmosphere; open Tues.-Sun., 7 am-3 pm, closed Mondays. 609-748-7000

**9** MYSTICAL ENCHANTMENT  
Offers accents for your home and garden; original silk flower arrangements, soy candles, birdbath fountains, and much more. 609-652-7676

**10** DAYS OF OLDE ANTIQUES & COLLECTIBLES  
We specialize in china, furniture, dolls, jewelry and collectibles; 70 dealers; 16,000 Sq. Ft. Co-op; open 7 days, 11 am-5 pm. 609-652-7011

**11** HORNERS GULF  
A Gulf gasoline station and self-serve car wash with vacs; last gas before Parkway on Route 9. 609-652-3082

**12** THE TOWNE OF HISTORIC SMITHVILLE & VILLAGE GREENE  
60 Shops; 7 Eateries; Weekend Events

**13** COLONIAL INN AT HISTORIC SMITHVILLE  
8 Unique Rooms; OPENING APRIL 2004

## Other Points of Interest

**A** MARSH AND BAYS EAST OF ROUTE 9 Harbor a variety of wildlife; some side roads offer limited access to crabbing and kayaking.

**B** VETERANS MEMORIAL PARK AT GALLOWAY  
Nice open field to fly a kite or reflect and honor our Veterans at the Memorial.

**C** LEEDS POINT  
One of the earliest settlements of the area. Many families depended on the bay for a living, as some still do to this day. This is the known birth place of "The Jersey Devil". The folktale started around 1800 with the birth of Mrs. Leeds' 13th child. Born like a demon with bat wings, tail and hooves, the creature is known to still roam the woods and swamps.

**D** CHESTNUT NECK  
Site of Revolutionary Battle. The British Fleet sailed up river to destroy storehouses and colonial settlements. They planned to eventually travel inland and destroy the ironworks at Batsto. Although the settlement of Chestnut Neck was burned by the British, the colonists held back the King's Army and the ironworks were saved. However, the settlement was never rebuilt. A monument now stands at the historic site.



For information on this brochure call Joe Ricciardi at 609-652-9491