PARKER RIVER NATIONAL WILDLIFE REFUGE

PLUM ISLAND

NEWBURYPORT, MASSACHUSETTS

(THACHER ISLAND NATIONAL WILDLIFE REFUGE)

ANNUAL NARRATIVE REPORT

Calendar Year 1994

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

REVIEW AND APPROVALS

PARKER RIVER NATIONAL WILDLIFE REFUGE

Newburyport, Massachusetts

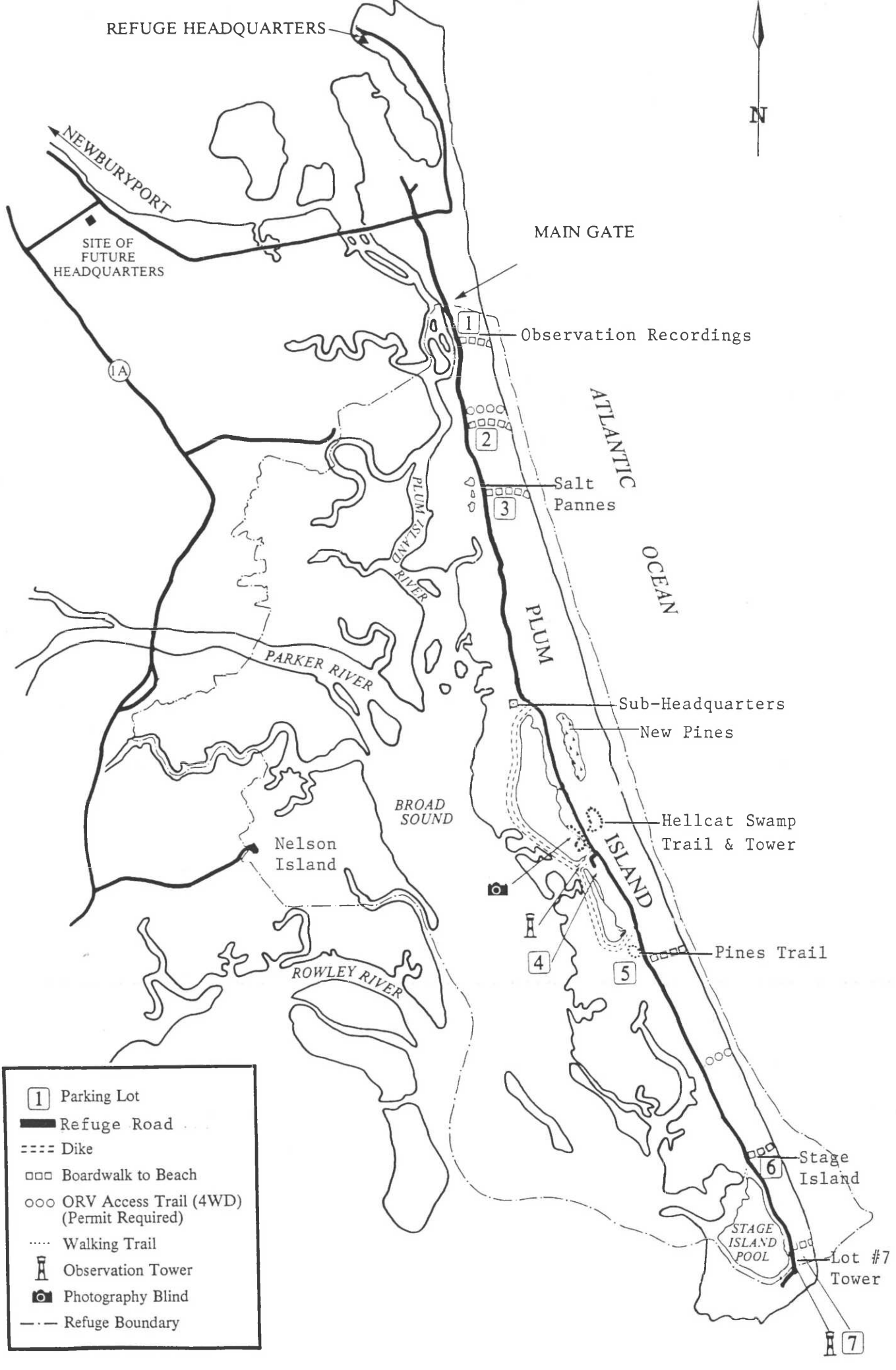
ANNUAL NARRATIVE REPORT

Calendar Year 1994

John L. Fillio
Refuge Manager Date

Donald N. Frickie 3-3-95
Associate Manager Review Date

Regional Office Approval 5-11-95
Date


REFUGE HEADQUARTERS
N
NEWBURYPORT
SITE OF FUTURE HEADQUARTERS
MAIN GATE
1
Observation Recordings
1A
2
ATLANTIC
OCEAN
Salt Pannes
3
PLUM ISLAND RIVER
PARKER RIVER
PLUM
Sub-Headquarters
New Pines
BROAD SOUND
Hellcat Swamp Trail & Tower
Nelson Island
ISLAND
4
5
Pines Trail
ROWLEY RIVER
6
Stage Island
STAGE ISLAND POOL
Lot #7 Tower
7
1 Parking Lot
Refuge Road
Dike
Boardwalk to Beach
ORV Access Trail (4WD) (Permit Required)
Walking Trail
Observation Tower
Photography Blind
Refuge Boundary

INTRODUCTION

Parker River National Wildlife Refuge is located on a barrier island in the northeast corner of Massachusetts, 38 miles north of Boston. The Atlantic Ocean borders the east side of the Refuge, while the townships of Newbury, Rowley, and Ipswich border the west side.

The Refuge covers almost all of the southern two-thirds of Plum Island, in addition to the extensive salt marshes between the island and the mainland to the west. Adjacent to the southern tip of the Refuge on Plum Island is Sandy Point State Reservation. At the northern tip of the island, the Refuge office and one Refuge residence are located in facilities that once belonged to the U.S. Coast Guard.

The Refuge portion of Plum Island is one of the few natural barrier island complexes remaining in New England. The 4,662 acres of Parker River Refuge are comprised of 2,994 acres of salt marsh, 1,229 acres of barrier beach/dune, 265 acres of freshwater pools, 88 acres of grasslands, and 86 acres of administrative lands.

The Refuge was established in 1942 to protect and preserve migratory waterfowl. Over time, this objective was expanded, as it was for all national wildlife refuges, to preserve and manage habitat for a diversity of species, with particular emphasis on endangered species. The Refuge beach is a key nesting site for the piping plover, which is listed as a Federally threatened species and is protected under the Endangered Species Act. It is also a stopover or nesting site for over 300 species of birds. Deer, rabbit, fox, beaver, muskrat, skunk, and opossum are also found on the Refuge.

Wildlife-oriented recreation, interpretation, and education on the Refuge are encouraged to the extent these activities are compatible with the resource. The area is a popular tourist attraction and the Refuge receives between 250,000 - 350,000 visitors annually for birdwatching, environmental education, wildlife observation, photography, surf fishing, clamming, hunting, and beach use. In order to lessen the human impacts on the resource, the Refuge uses closed areas, permits, signing, law enforcement patrols, and limits the number of vehicles allowed on the Refuge.

Thacher's Island NWR in Rockport, Massachusetts is an unstaffed satellite Refuge administered by Parker River Refuge.

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A. HIGHLIGHTS

Successful resource management activities included completion of a fourth salt marsh restoration site, water manipulations that significantly increased waterfowl pair and brood counts from the past three years, and prescribed burns of Refuge fields. (Sections F and G)

The Plover Management Program was again successful. The Refuge fledged 23 plover chicks from 15 pairs resulting in a productivity rate of 1.5. The number of plover pairs increased by approximately 50% from 1993 and by 100% from 1992! (Section G.2)

A year-long public use survey was completed in May. (Section H.1)

At the close of the year, Refuge staff vacancies for the Outdoor Recreation Planner, Biologist, and Refuge Officer were finally filled...ending a total of five year's worth of vacancies! (Section E.1)

The Friends of Parker River National Wildlife Refuge continued their active support of Refuge goals. (Section E.4)

Road resurfacing was completed on the 2.7 mile gravel portion of the Refuge road. (Section I.1)

Aerial view of Parker River National Wildlife Refuge (Unknown, 8/85)

B. CLIMATIC CONDITIONS

TABLE 1: WEATHER SUMMARY FOR 1994

	AVG. TEMP.	HIGH	LOW	PPT.	SNOW
JANUARY	14°	47°	-12°	4.57"	28.25"
FEBRUARY	20.1°	60°	-3°	1.70"	20.25"
MARCH	33.8°	62°	0°	6.42"	10.75"
APRIL	46.8°	83°	27°	2.82"	----
MAY	54.5°	86°	34°	4.61"	----
JUNE	68.5°	95°	44°	1.42"	----
JULY	73.7°	96°	54°	1.35"	----
AUGUST	68.2°	91°	49°	4.44"	----
SEPTEMBER	59.2°	83°	41°	7.37"	----
OCTOBER	50.4°	74°	31°	.68"	----
NOVEMBER	40.7°	74°	18°	3.07"	.5"
DECEMBER	31.7°	58°	6°	5.67"	.75"

TABLE 2: WEATHER HIGHLIGHTS FOR 1994

JANUARY	Coldest on record; wettest since 1987
FEBRUARY	Fourth coldest on record; seventh driest
MARCH	Low of 0° broke record of 1982; fourth wettest
MAY	Low of 34° broke record of 1965
JUNE	High of 95° broke record of 1967
JULY	Warmest July on record; 21 days of above normal temperatures; fourth driest
AUGUST	Low of 49° broke record of 1964
SEPTEMBER	Wettest ever on record; five inches of rain during one storm
OCTOBER	Driest on record
DECEMBER	Third warmest; little snow

C. LAND ACQUISITION

1. Fee Title

No land acquisition has occurred since 1985. The total Refuge acreage is 4,662.

D. PLANNING

1. Master Plan

Master Plan objectives accomplished in 1994 consisted of the re-graveling of the southern 2.7 miles of the Refuge road. The project also included the addition of 3,500 linear feet of wooden guard rails. Contractor for the project was Busby Construction Co., of Atkinson, NH in the amount of $637,845.00. The work included adding roughly twelve inches of base gravel over a geo-textile fabric and grid, as well as the placement of two cmp drainage pipes. A crushed stone/stone dust mix was then added as a finish course resulting in a firm, hard-packed surface that should hold up better under traffic and adverse weather conditions. As a carryover using leftover funds, an additional 2,000 linear feet of guard rail will be installed in FY '95.

2. Management Plan

The following management plans/programs were completed or revised in 1994:

* Annual Shorebird Management Program/Piping Plover and Least Tern
* Prescribed Burn Program
* Annual Big Game Hunting Program (no hunt in 1994)
* Annual Pesticide Application Program

3. Public Participation

Refuge cooperation with the Friends of Parker River Refuge continued throughout the year with Primary Assistant Refuge Manager Martinkovic providing much needed coordination and informational contacts. ARM Martinkovic was instrumental in keeping the Friends well informed of Refuge programs, issues, and needs. The Friends, in cooperation with the City of Newburyport (Mayor Mead), the Chamber of Commerce, and local merchants have initiated the process whereby the need for a Headquarters and Visitor Center has been brought to the attention of the Congressional delegation in Massachusetts.

ARM Martinkovic, in the absence of an ORP, also coordinated Refuge participation in the second annual Spring Plover and Wildlife Festival sponsored jointly by the Refuge, Maudsley State Park, The

Friends, and the Chamber of Commerce (Newburyport). In addition, ARM Martinkovic coordinated the Refuge participation in the local Fourth of July Celebration and the Yankee Homecoming Celebration and parade.

Upon his arrival, Outdoor Recreation Planner Steve Haydock continued Refuge participation with the Newburyport Chamber of Commerce as a member of the Tourism Committee.

Through the continued hard work and dedication of ARM Martinkovic and ORP Haydock, Refuge community relations have improved tremendously, with the Refuge receiving a great deal of support from the public, local merchants, and community leaders.

4. Compliance with Environmental and Cultural Resource Mandates

S.E.A. Consultants, Inc. of Cambridge, MA continued their efforts to complete the final characterization of all the contaminants located on tract #1100 - hazardous waste site.

During the fall of 1994, final soil samples were taken in conformance with the protocols established under the Massachusetts Contingency Plan for Oil and Hazardous Waste (MCP). Specifications for cleanup contracts can now be prepared in order to solicit for bids in 1995.

In February of 1994, representatives from the Refuge, RO-Engineering, and S.E.A. Consultants again appeared before the Newburyport Conservation Commission for a final decision regarding local wetlands permits. Since the potential exists for remedial action in the 100' buffer zone surrounding a small wetland on the site, an Order of Conditions was required. The Commission voted favorably, after contracting with a third-party consulting firm to review the reams of data already gathered. This process, mandated by the Commission in December of 1993, delayed any and all work for at least a three month period.

On June 21, 1994, Regional Archeologist John Wilson and Rick Kanaski conducted an investigation at the site of the Pines Trail rehab project. The archeological survey revealed eleven prehistoric features consisting of ten small and shallow buried middens and one deflated midden on the trail surface. No material was found to suggest differing age or function of the features, and there were no topographic barriers between them. The eleven features are then considered to be one site.

In view of the archeological features found, the trail's design and layout will be altered to preserve the site. This approach will ensure that the project will have no effect upon significant archeological resources in compliance with Federal legislation.

5. Research and Investigations

The public use survey designed by a graduate student from University of New Hampshire, Laura Gilbert, continued into 1994 (survey initiated May 1993). Volunteers and entrance gate staff were extremely helpful in devoting their time to distribute these surveys. The surveys were distributed until the end of May, giving L. Gilbert public use data for one year. Results and conclusions were written in a final report submitted to the Project Leader and are summarized in Section H.1.

6. Other

Secretary of the Interior Babbitt and Service Director Beatty initiated a new approach to resource management, Ecosystem Management, in 1994. A workshop was held at the Regional Office in May which outlined the Service's and the Region's approach to Ecosystem Management. Ten ecosystems were delineated, with teams established to develop and prepare an Ecosystem Management Plan and budget covering FY's 95, 96 and 97.

Parker River NWR falls within the Gulf Of Maine Rivers ecosystem (GOMR) which includes all of Maine, roughly half of New Hampshire, and the eastern part of Massachusetts (excluding Cape Cod). The GOMR Ecosystem Team consists of Project Leaders from Refuges, Ecological Services, Hatcheries, Fisheries Coordinators (in New England), RO representatives and LE for a total of 20 members.

The initial charge to the Team was to develop a draft GOMR Ecosystem Plan by mid-August of 1994, with the final Plan and budget by September. The Plan was completed, submitted and approved on time after six intense Team meetings. The Plan consists of seven resource priorities, with subsequent action strategies and action items which identifies the direction that the Team feels most important in the GOMR. Additionally, a most important aspect of the Ecosystem approach is the development of a closer working relationship between Divisions and Project Offices and between the Service and both State and non-government partners. To that end, representatives from the State fisheries and wildlife agencies in Maine, New Hampshire and Massachusetts have become active members of the Team.

E. ADMINISTRATION

1. Personnel

NAME	TITLE	GRADE	EOD	STATUS
John Fillio	Refuge Manager	GS-13 PFT	09/18/83	Active
Patricia Martinkovic	PARM	GS-12 PFT	10/09/88	Active
Frank Drauszewski	ARM	GS-9 PFT	05/03/92	Active
Stephen Haydock	ORP	GS-9 PFT	07/10/94	Active
Glynnis Nakai	Operations Spec.	GS-9 PFT	06/02/91	Active
Clifford Lundblad	Maint. Worker	WG-8 PFT	08/30/87	Retired
Gary Burke	Maint. Worker	WG-8 PFT	10/04/92	Active
Robert Springfield	Wldlf. Biologist	GS-7 PFT	04/22/90	Active
Timothy-John Donovan	Refuge Officer	GS-7 PFT	07/10/94	Active
Linda Garcia	Office Asst.	GS-6 PFT	02/25/90	Active
Susan Becker	Refuge Officer	GS-5 TFT	04/17/94	Appt. Ended
Brian Liening	Refuge Officer	GS-5 TFT	05/01/94	Appt. Ended
Martha Parmenter	Clerk-Typist	GS-4 PFT	07/30/90	Active
Carol Crowell	Park Ranger	GS-3 TPT	04/17/94	Terminated
Renate Kovacs	Park Ranger	GS-3 TPT	03/08/92	Terminated
Erin O'Sullivan	Park Ranger	GS-3 TPT	05/03/92	Terminated
Lorene Scanlon	Park Ranger	GS-3 TFT	06/26/94	Terminated
David Poore	Park Ranger	GS-3 TPT	07/10/94	Terminated

Personnel changes during the year were as follows:

* Robert Springfield was promoted from temporary Refuge Law Enforcement Officer to permanent Wildlife Biologist on May 1, 1994.

* The long-vacant position of Refuge Law Enforcement Officer was filled on July 10, 1994 by Timothy-John Donovan who transferred to Parker River from the National Park Service. The position had been vacant since Ross Lane transferred to National Marine Fisheries in 1993.

* Stephen Haydock transferred from Klamath Basin NWR on July 10, 1994 to fill the position of Outdoor Recreation Planner.

* Glynnis Nakai was converted to permanent Refuge Operations Specialist on May 29, 1994.

* Susan Becker and Brian Liening worked as seasonal Refuge Officers this summer. Brian's appointment expired on 9/17/94 and Sue's on 10/1/94.

* Maintenance Worker Clifford Lundblad retired on 12/29/94.

Back row (left to right): Martinkovic, Springfield, Garcia, Burke, Drauszewski, Fillio. Front row (left to right): Haydock, Nakai, Parmenter, Donovan.
(S. Drauszewski, 1/95)

A five-year comparison of on-board strength follows:

TABLE 3: FIVE-YEAR COMPARISON OF REFUGE STAFF

	Permanent			
	Full-Time	**Part-Time**	**Temporary**	**Total FTE's**
FY 94	11	0	2.4	12.40
FY 93	7.5	1.5	3	12.00
FY 92	10	0	10	14.10
FY 91	10	0	10	17.08
FY 90	10	0	11	15.42
FY 89	11	0	12	19.58

2. Youth Programs

Parker River Refuge was fortunate once again to host a Youth Conservation Corps, non-resident summer camp. As in past years, this year's camp was funded for six positions.

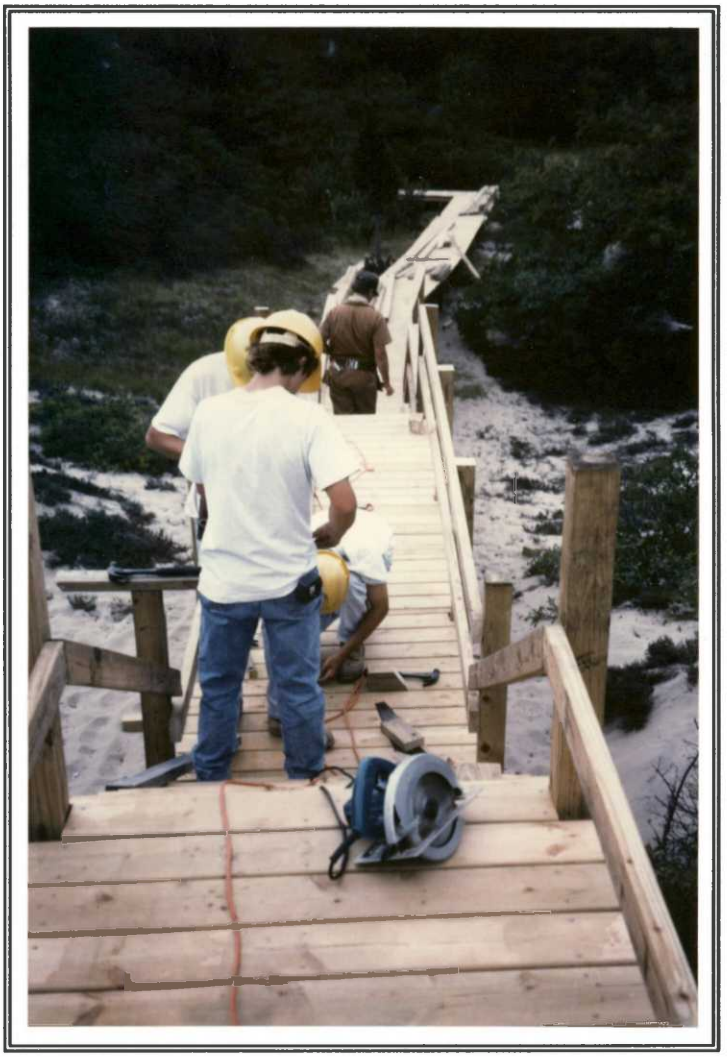
YCC Enrollees for 1994 - Art Rocha, Kate Daugherty, Kristen Jule, Kate Tierney, Dan Dash, Gabe Bernier, and Group Leader Mal Fraser (Parmenter, 8/94)

A news release advertising the program was published in the local newspaper in mid-March and application packages were delivered to four area high schools. A total of forty applications were received. Twenty-six males and fourteen females applied for the positions. A random selection was conducted towards the later part of April. Final interviews and paperwork were completed in mid-May and an orientation for the six enrollees and their parents was held on May 25. The program started in earnest on June 27.

Long-time YCC Group Leader Mal Fraser was back again to continue his excellent work with the program. The enrollees selected this season developed into a strong group. Activities and projects they were involved in included: an orientation to the Refuge, Red Cross First Aid and CPR training, trail and boardwalk brushing, Canada Goose round-up and banding, duck banding, dismantling 1,000 linear feet of old boardwalk, and the construction of a new boardwalk loop as a replacement. Field trips to the Nashua Fish Hatchery and the Museum of Science in Boston rounded out the summer for Parker River

YCC '94. The program was completed on August 19th with a cookout and tour of the completed boardwalk for the enrollees' parents and friends.

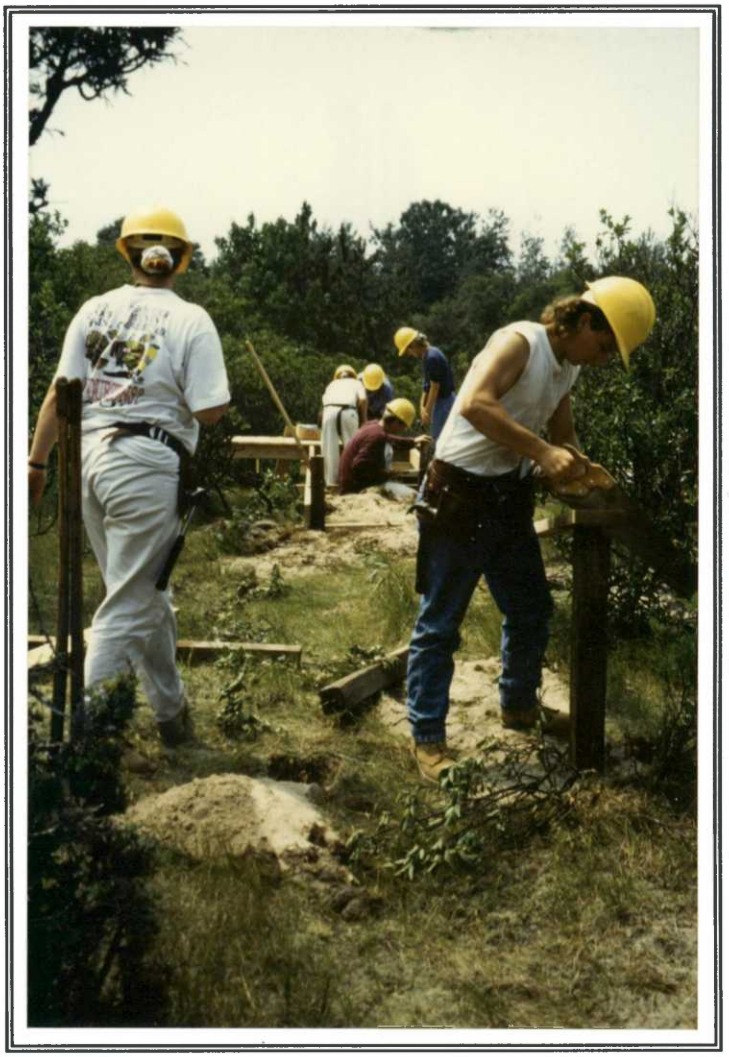
To reiterate on Mal Fraser's position as Group Leader of YCC, it is a pleasure to administer a YCC summer camp with Mal in charge of the day-to-day operations of the program. Mal has been a Group Leader for over 20 summers and, without his dedication and hard work, many of the summer's work accomplishments would not have been completed in the fashion they have been. Mr. Fraser is a full-time science teacher at a local high school and understands the enrollees as well as any adult. It is because of this, and his true belief in what the Refuge stands for, that makes having him on board a joy.



Constructing the new section of boardwalk at the Dune Loop (Fraser, 7/94)

Another youth program which took place on the Refuge this summer supplemented the YCC program nicely. Turning Point, Inc., a program for disadvantaged youths, provided fifteen teens and two Group Leaders to work on the Refuge two days per week for a total of five to six hours per day. This group, which has worked on the Refuge in the past, provided valuable assistance on this summer's major project which was the construction of the boardwalk loop. Turning Point removed old sections of boardwalk and carried a great deal of lumber to the work site. This hard work contributed to the timely completion of this project. As noted under the YCC section, one thousand feet of old boardwalk was dismantled and removed! Without Turning Point's assistance, the project could not have been completed within the time frame allotted for the summer program. This group also found time to conduct a beach cleanup, brush trails, and participate in this year's goose roundup and banding.

Turning Point, Inc. helped out on boardwalk construction by carrying out old sections of boardwalk.



Construction activity abounds in setting up the posts and stringers for the boardwalk. (Fraser, 7/94)

4. Volunteer Program

The Refuge Volunteer Program remained very active during 1994 with a total of 5,005 hours donated as follows:

*	Adopt-A-Beach	780 hours
*	Friends of Parker River National Wildlife Refuge	530 hours
*	Student Conservation Association	480 hours
*	Student Intern, Antioch University	150 hours
*	Student Intern, Governor Dummer Academy	280 hours
*	Student Intern, Union Institute	280 hours
*	"Regular" Volunteers	2,505 hours
	Total	**5,005 hours**

Each spring and fall, local residents Trish Walker and Cid Raschke of Adopt-A-Beach coordinate a cleanup of the six miles of Refuge beach. This year, in March and September, 90 volunteers, several Refuge staff members, and 300 students from Rupert Nock Middle School joined in the cleanup.

Truckload after truckload of debris was removed from the Refuge beach in both March and September through the volunteer efforts of "Adopt-A-Beach." (Haydock, 9/94)

The Friends of Parker River National Wildlife Refuge and its President, Beverly Heinze-Lacey, also deserve special mention for their continued support of the Refuge and its management objectives. During this third year of existence, the "Friends" staffed the Visitor Contact Station (VCS) during the summer and early fall, sponsored various education programs including the second annual Plover and Wildlife Festival, and lobbied congressional representatives in support of a Refuge Visitor Center.

On March 22, SCA Volunteer Jeanette Ritter of Syracuse, New York began a 12-week program that exposed her to many facets of Refuge operations. Among other duties, Jeanette conducted educational programs on endangered species for local schools, assisted Refuge staff in the construction of piping plover predator exclosures, served as a plover warden, staffed the Refuge entrance kiosk, and surveyed Refuge wildlife.

Student interns also made significant contributions to the Refuge during 1994. Kristin Jule, a senior at Governor Dummer Academy, volunteered at the Refuge from April 11 to May 20 in participation of a school program which enables students in good-standing to receive hands-on experience in an area of interest, and in turn receive school credits. Kristin volunteered three times a week (18 hours/week) and assisted with various projects including administrative (xeroxing, collating, safety/fire extinguisher checks, mailings), biological (bird surveys, erecting predator exclosure fences), and public use (assisting gatehouse attendant, distributing public use surveys, plover wardening). Her positive attitude and willingness to pitch in were greatly appreciated.

Jim Lacey, working on a doctorate in business administration at Union Institute, managed the VCS. Duties included coordinating the staffing of the facility with "Friends" volunteers, performing VCS fixed information duty, developing temporary displays, and maintaining records.

Nancy Sullivan, working on a master's degree in environmental science at Antioch University, contributed 150 hours towards the development of a Refuge educator's guide.

In 1994, the Refuge Volunteer Program consisted of 74 "regular" volunteers who contributed 2,505 hours of time, talent, and enthusiasm! Of these hours, 573 were donated toward the biological program (bird surveys, deer counts, waterfowl banding, etc.), 24 towards educational programming (bird walks, etc.), and 553 in maintenance (brush clearing, painting, platform construction, etc.). Also, 41 volunteers worked as "Plover Wardens," contributing 1,355 hours during the piping plover nesting season. Plover Warden responsibilities included fixed duty on the Refuge beach to educate the visiting public concerning the Federally threatened piping plover and least tern and the beach closure. During 1994, Plover Wardens made 3,126 public contacts, a 42 percent increase over 1993. This "education and public relations" effort is a significant factor in the success of the Refuge's plover and tern management program.

The grounds at Refuge Headquarters were made more attractive through the efforts of Refuge Volunteer Bob Solazzo. (Martinkovic, 7/94)

On October 2, approximately 50 Refuge Volunteers, staff, and families celebrated "Volunteer Appreciation Day". Following a historic walking tour of Newburyport lead by Bill Steelman of Heritage Discovery Tours and a cookout at Refuge Headquarters, an awards ceremony was held with items of recognition based on annual and cumulative hours. Eight volunteers donated 100 or more hours with Ken Dudley (276 hours), Bill Drew (202 hours), and Phyllis Drew (196 hours) ranking as the top three. While no one this year reached "1,000 or more hours" cumulatively, there are some volunteers rapidly and steadily approaching this mark.

5. Funding

TABLE 4: FY 1994 FUNDING SUMMARY

Minimum Cost	$449,124
Base Maintenance Target	$ 44,000
Fix Safety Items	$ 5,000
Remove Excess Bldgs. (CSH)	$ 10,000
SCA Position/Intern	$ 3,500
Wetland Rest. (OMWM)	$ 15,000
NWS Fire Supplies	$ 2,000
Museum Property Care	$ 2,500
Replace Sanit. Facs. (Lot #4)	$ 25,000
Rehab. Pines Trail (504)	$ 15,000
YCC	$ 16,666
TOTAL	**$587,790**

(Contaminants Funds)----------$1,174,647
(Road Gravel/Const.$)---------$ 789,845

(1) Contam. $-expended $295,509 in FY '94
(2) Constr. $-expended $637,845 in FY '94

TABLE 5: FIVE-YEAR FUNDING COMPARISON

	1994	1993	1992	1991	1990
1261	$321,240	$420,212	$519,497	$385,211	$339,109
1262	$259,000	$ 77,500	$ 48,000	$ 98,000	$ 82,930
8610	$ 14,700	$ 14,400	$ 17,000	$ 2,000	$ 2,389
4960	$ 35,195	$ 19,575	$ 28,456	$ 31,372	$ 31,850
YCC	$ 16,666	$ 0	$ 16,736	$ 16,670	$ 14,300
FIRE	$ 2,000	$ 0	$ 1,000	$ 9,500	---
TOTAL	**$629,705**	**$531,687**	**$630,689**	**$542,753**	**$470,578**
CONT.	$1,175K	$1,138K	$2,087K	$200,000	$775,000
CONST.	$789.8K	$1,358K	0	0	0

6. Safety

There were no lost-time accidents by Refuge staff in 1994. The total number of days since the last lost-time accident was 1,304.

Thanks to special funding from RO-Refuges and Wildlife, all the identified safety action items were corrected.

Safety meetings were conducted each month by Refuge staff members.

Employees involved in aerial deer counts on the Refuge attended aviation safety training and are now in compliance with Federal regulations.

7. Technical Assistance

ARM Martinkovic continued to serve as the Refuge representative to the Executive Board of the Friends of Parker River National Wildlife Refuge during 1994.

In April, ARM Drauszewski served as a Firearms Instructor at the Law Enforcement Refresher, as well as to several New England refuges.

In September, MW Burke and ORP Haydock served as instructors for the annual Youth Waterfowl Hunter Training Program sponsored by the USFWS and the League of Essex County Sportsmen's Clubs (see section H.8 for more information).

One request for assistance with problem geese at a golf course was received and processed in November.

8. Other

Kelly Burke, daughter of MW Gary Burke, chose to accompany her father to work on "National Take Your Daughter to Work Day". Kelly spent the day assisting with the cleaning of the observation platform, helping her dad service the road grader, and lending a hand in the front office.

Kelly Burke "taking over" for Clerk Parmenter. (Burke, 4/94)

F. HABITAT MANAGEMENT

2. Wetlands

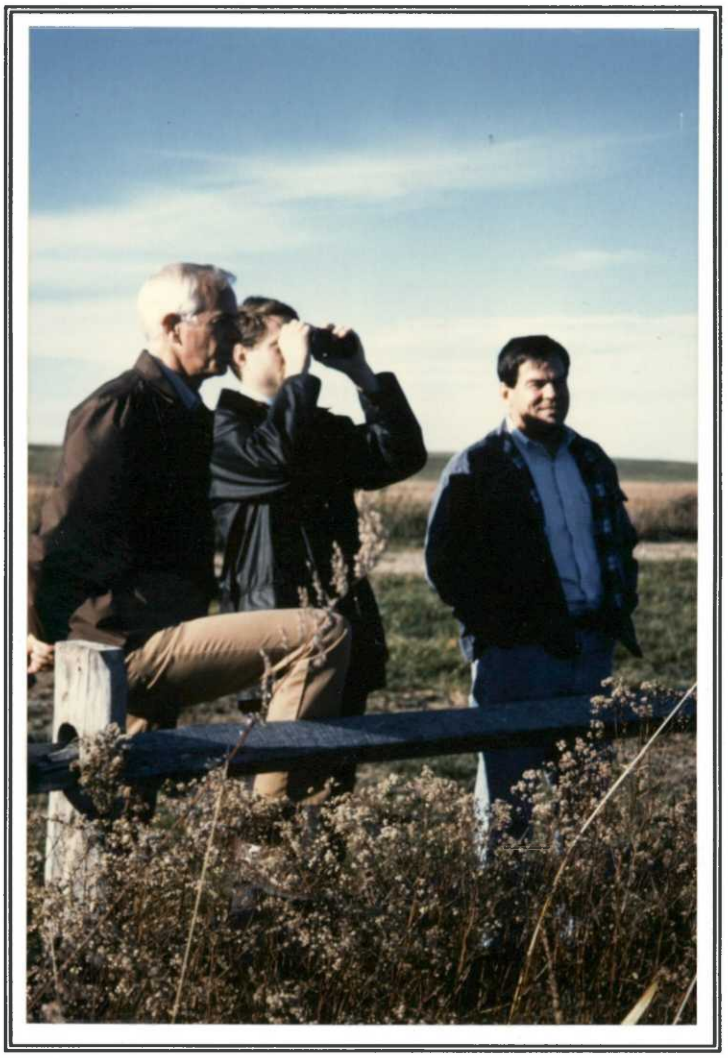
Refuge management efforts continued to focus on the rehabilitation of the three fresh water impoundments. Water level, salinity, and pH readings were recorded for all impoundments throughout the year. All three impoundments are totally dependent upon precipitation and run-off for freshwater influx, thus diminishing management

capabilities. Eutrophication, silting of ditches, pest plant expansion, and general aging of the Refuge impoundments have seriously impacted their habitat diversity and wildlife value, particularly North and Bill Forward Pools. Management strategies to increase the integrity of the impoundments include moist-soil management, pest plant management, and wetland enhancement using heavy equipment (e.g., cookie cutter to establish channels and increase water/vegetation interspersion). Management efforts were also focused on the continuation of open-marsh water management/ salt marsh restoration projects on the extensively ditched Refuge salt marsh.

Pools - Spring water levels were extremely high in the Refuge impoundments due to the accumulation of snow runoff and precipitation. Water levels extended into the adjacent grasslands within each impoundment and remained high into June/July. Water levels were drawn down periodically during the fall, after waterfowl breeding season was completed, in preparation for a prescribed burn in accordance with pest plant and grassland management plans. In the fall, water levels remained fairly high due to large amounts of precipitation.

On November 3, Managers Fillio and Martinkovic conducted a tour of the Refuge for Phil Warren, Ducks Unlimited (Northeast) and Keith Reuben (DU, West). Their visit to the Refuge was in conjunction with the our request for a Challenge Grant with Ducks Unlimited to fund the installation of a "screw-gate" at the North Pool water control structure. This type of gate will eliminate the current wooden boards which are weathered and not as effective in water control within the North Pool. On-site evaluation and replacement with the new gate is proposed for 1995.

North Pool - This 100-acre impoundment is used by waterfowl, shorebirds, marsh and wading birds, and a diversity of other wildlife species. A system of channels and ditches exist in this pool, several of which have silted in since the Cookie Cutter was used in 1990 to widen and deepen them. Use of the Cookie Cutter in 1994 was minimal due to loan time and machinery malfunctions; however, Refuge staff were able to restore some of the silted channels. The pool has a water control structure, completed in 1988, which is a direct outlet to the saltwater estuary (Broad Sound waterway). Due to the lack of effective water management capabilities (no freshwater source other than natural precipitation and runoff) and lack of funding, the pool is dominated by cattails (*Typha*) and two pest plant species, *Phragmites* and purple loosestrife (*Lythrum salicaria*). Active management in the form of Rodeo application, cutting, burning, and water level manipulation was conducted to control these plants and enhance native vegetation germination in the spring. Water levels were drawn down continuously in the fall/winter 1994 to prepare for a potential burn during the later winter months (early 1995).



Phil Warren and Keith Reuben of Ducks Unlimited viewing the North Pool with Manager Fillio. (Martinkovic, 11/94)

Bill Forward Pool - This 62-acre impoundment is separated from the North Pool by a small dike containing a water control structure which allows the transfer of water between the two pools. The Bill Forward Pool is much shallower than North Pool and more heavily used by shorebirds and wading birds, in addition to waterfowl and other wetland species. The pool does not retain water adequately, but migrating shorebirds take advantage of exposed mudflats from declining water levels in the summer. In contrast to North Pool, Bill Forward Pool lacks the system of smaller channels and ditches

off its main waterway. Approximately 50% of the pool is open water. In previous years, vegetation in the Bill Forward Pool has been primarily cattail and *Phragmites*; however, due to the high water level during the spring this year, it appears that *Phragmites* did not germinate in some areas, whereas purple loosestrife thrived. Options for rehabilitation/restoration include continuation of pest plant control to encourage vegetative diversity, dredging ditches and channels off its main waterway to increase water/vegetative interspersion, and applying a seal along the dike to enhance water conservation and water level management.

Stage Island Pool - This 100-acre impoundment has a large amount of water/vegetative interspersion with several islands and peninsulas in both shallow and deep water. This pool consists primarily of cattails with patches of *Phragmites*; however, the latter is not as prevalent as in the North and Bill Forward Pools. The presence of purple loosestrife has been minimal in previous years; however, high water levels in spring with slow natural drawdowns during summer created a preferred environment for this species. Some small stands of purple loosestrife were evident during the summer months but not enough to warrant the application of glyphosate, (Rodeo) this year. Despite the presence of pest plants, the pool supports the greatest diversity of waterfowl, wading birds, and shorebirds. Rehabilitation/restoration strategies include continuation of pest plant control and re-dredging of silted ditches and channels to maintain a high level of water/vegetative interspersion.

Salt Marsh - The salt marsh portion of the Refuge consists of approximately 3,000 acres of *Spartina* grasses interspersed with creeks, mudflats, and pannes. The marsh was extensively ditched in the past to control mosquito populations and/or drain for salt marsh hay production. Several of the ditches have filled in naturally, restoring some of the former salt pannes, particularly at the Salt Pannes Wildlife Observation area between Boardwalks #2 and #3. The marsh is part of the largest salt marsh system north of Long Island Sound. It is a valuable spawning and nursing area for many of the major marine food sources. Eight of the twelve fish species most important to local commercial and sport fisheries are dependent upon these tidal areas. A diversity of shorebirds, wading birds, waterfowl, and other wildlife species are also dependent upon these tidal wetlands. Management of the salt marsh is primarily through protection, restoration, and enhancement of the ecosystem for a diverse assemblage of avian species and other organisms in the biological community.

The Essex County Mosquito Control Project (ECMCP) performed open-marsh water management (OMWM) in areas adjacent to previous OMWM sites on the salt marsh, north of sub-headquarters. This is the fourth year of a cooperative agreement for mosquito abatement and salt marsh restoration. From March 31 to April 14, ECMCP completed work on site #304C (1.21ha), which was delayed due to the onset of winter and machinery breakdowns in 1993. This site was functional throughout the year. A fourth site (#304D) was delineated and excavated from October 5 to November 18. This site is approximately 1.12ha in area. The cooperative agreement also includes one year of pre-OMWM and two years of post-OMWM monitoring of mosquito larvae, fish populations, and water parameters (salinity, dissolved oxygen, and temperature). Results indicate a decrease in the larvae production and increase in fish populations in the pools.

A study to investigate the use of OMWM sites by wildlife was initiated June 24 and monitoring continued until October 3. Results from this study indicate comparable use of OMWM site #304C with the control site (no OMWM conducted). Waterfowl species (ducks, geese) were predominant within this site and shorebird species were frequently recorded. During the period of this study, site #304D had only been delineated and excavation had not started. This site possessed few natural pools of water and subsequently, bird use was rare. This study will be continued in 1995 to obtain data on wildlife use in consecutive years to look at trends of wildlife use in OMWM sites.

5. Grasslands

Mowing of the North and Bill Forward Pool dikes were completed by mid-July. This activity is done annually to discourage nesting because of high predator use of the dikes. Other grassland areas mowed on the Refuge this year included half of the North field and half of Cross Farm Hill. To reduce a build-up of a duff layer and to restore nutrients to the soil, Stage Island field was burned this year instead of being mowed (see Fire Management section), as was half of Cross Farm Hill, which resulted in half the field being mowed and the other half a patchwork of burned areas.

Mowing of Nelson's Island field was conducted by a local hay farmer working under a Special Use Permit. The field was completed in September. Alternate mowing and burning of fields will continue for the purpose of maintaining the fields in various stages of succession, thereby providing a greater diversity of plants and higher wildlife value.

8. Haying

Two Special Use Permits (SUP) were issued to mow salt marsh hay on the west side of the Refuge. Approximately fifty-two acres were mowed on two separate tracts. One tract was located near Jericho Creek and was 35 acres in size. The other area mowed was Nelson's Island which included 17 acres. Mowing was completed by the end of September. Mowing Nelson's Island Field prior to waterfowl migration accomplishes three things: controls phragmites (optimum time to mow late August - early September), keeps the field in a successional stage, and provides an open field for migratory geese to use as a feeding or loafing site.

In addition, the salt marsh haying which occurs on the Refuge is alternated between sites preventing compaction of the marsh and benefiting marsh and water birds and raptors by creating a patchwork of open feeding areas.

9. Fire Management

Last year, the prescribed burn window was made larger by approval from the State to allow for a fall burn season (September 1 - October 31). Previously, the season was January 15 - April 30th. This year, permission was obtained from the Air Quality section of the State DEP to extend our time frame until November 30th.

Conditions in the impoundments were too wet for a successful burn this year. Three to four feet of snow remained in the impoundments until spring and water levels were kept high as a means to control pest plants. Soil moisture content also remained high as a result. In addition, a very mild fall season prevented vegetation (mainly cattail) from curing which precluded a burn in 1994.

Successful prescribed burns were conducted on Cross Farm Hill and Stage Island Field during the month of November. These fields were mowed in the past to keep succession back and to create edge habitat. Burning removed the duff layer and should result in good regeneration next spring.

ARM Drauszewski was a member of the White Mountain #4 Interagency fire crew and participated in suppression efforts on two wildfires in Idaho this summer. Frank was a Squad Boss on the Cuddy and Chicken complex fires.

Prescribed burn of the South Field generated light smoke and low flames based on the light fuels. The burn created a patchwork of charred areas which should green up well in the spring. (Martinkovic, 11/94)

ARM Drauszewski setting a "slow" backing fire on the South Field. (Martinkovic, 11/94)

10. Pest Control

The Refuge successfully appealed Newbury Conservation Commission's disapproval to apply glyphosate (Rodeo) in the impoundments for pest plant control and received a superseding order from the State DEP. Thus, permits were granted by Newbury, Rowley, and Ipswich approving the habitat manipulation activities, including the application of Rodeo, over a five-year period. A stipulation to the appeal was that the Refuge conduct a study to investigate the effects of Rodeo on wetland vegetation. This study was conducted from July to October in the North and Bill Forward Pools (the final report is in progress). This study will continue in the spring/ summer 1995 to measure the actual effects of Rodeo applications.

Purple Loosestrife (*Lythrum salicaria*) blooming in the North Pool - colorful, but a competitive pest plant! (Drauszewski, 8/94)

The aerial application of Rodeo in 1991 and 1992 resulted in effective control of pest plants (primarily *Phragmites*, at that time) in all the impoundments. Rodeo was not applied in 1993; this may be one reason why pest plants appeared more prevalent, especially in the North and Bill Forward Pools. This emphasizes the need to continue management strategies annually, especially at this early stage of control. In the past, *Phragmites* has been the target species for Rodeo application. However this year, purple loosestrife was more prevalent than *Phragmites*. Instead of timing the application to seeding of *Phragmites*, it was moved back one to

two weeks to time it with the flowering of purple loosestrife, in addition to early seeding *Phragmites*.

On August 9, Plymouth Helicopters applied Rodeo to marked areas in the North and Bill Forward Pools. Stage Island Pool was not sprayed because pest plant presence was minimal. Rodeo was applied over approximately 20 acres at a rate of 0.5 gallons/acre. Within 14 days, visual observations revealed approximately 80% of the vegetation was affected. Pest plant control will continue to include a combination of different strategies: water management, mowing, prescribed burns, and aerial and/or spot spraying. The objective of this program is to obtain and maintain control of pest plants and increase vegetative diversity beneficial to avian species.

G. WILDLIFE

1. Wildlife Diversity

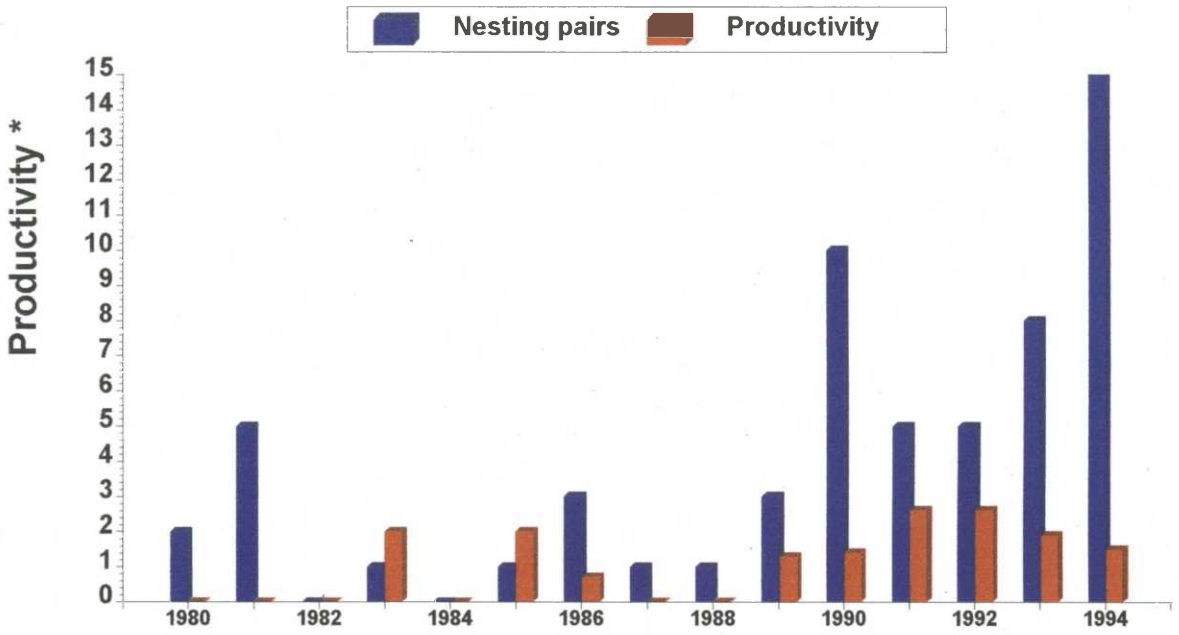
Habitat management efforts focused on creating habitat diversity for a variety of wildlife species. A combination of management practices, including prescribed burning, mowing, haying, and open-marsh water management were implemented on Refuge field, salt marsh, and impoundment habitats.

2. Endangered and/or Threatened Species

Piping plover chicks in nest - newly hatched but soon they'll be up and running! (Springfield, 7/94)

It was a banner year for piping plovers nesting on the Refuge beach! The first plovers sighted on Plum Island were on March 25 at Sandy Point State Reservation and April 1 on the Refuge. The highest number of successful nesting pairs occurred this year - a total of 15 pairs hatched 50 chicks, and fledged 23.

Despite the higher number of nesting pairs this year, productivity was 1.5 chicks fledged per pair. This represents a 21% decline in productivity from the 1.9 fledged chicks per pair observed in 1993.



Piping plover nesting pairs and subsequent productivity (*number of fledged chicks per nesting pair) at Parker River NWR, 1980-1994.

In 1991 and 1992, productivity nearly doubled with 13 chicks fledged by five pairs (P=2.6 chicks/pair) in both years, compared to 14 chicks fledged by ten pairs (P=1.4) in 1990. In 1993, 15 chicks fledged from eight nests and productivity totaled 1.9 chicks/pair. The decline in productivity observed on the Refuge in 1994 mirrors that of the State which showed a 6% decline in productivity. The high number of nesting pairs exemplifies the Refuge's potential for maintaining an even more substantial breeding population of plovers; however, additional strategies and monitoring are needed to enhance chick survival and thereby increase productivity. Although the Refuge's productivity was lower than the State-wide productivity for 1994, it is a significant contribution to the Atlantic coast breeding population.

The institution of a complete beach closure since 1991 appears to be a significant factor in the increased number of pairs in recent years. On April 1, the Refuge implemented a total beach closure to protect nesting plovers and terns. Based on the location of nests

and the progress of chicks fledging, a portion (0.6 miles) of the beach was opened to the public on July 1. An additional 5.0 miles were opened August 1, and the remaining section was open to the public on August 13. The beach closure allows plovers to select their territories and raise their young undisturbed; thus increasing pair use and optimizing nesting success. Pairs appear to be exploiting the extreme northern habitat in response to decreasing trespass problems since the complete closure was first implemented. This year, a majority of the nests (84%) were north of the 3.5 mile marker.

**Precocious and camouflaged chicks -
it was a challenge keeping track of fifty chicks!
(Springfield, 7/94)**

Of the 50 eggs hatched, 23 chicks fledged with 44% of the chick loss occurring within the first week after hatching. The reason for the disappearance of numerous chicks and the subsequent decrease in productivity is unknown; however, several factors may have contributed to their loss: predation and stress from a high population of foxes and gulls, inexperienced young nesting pairs, lack of grassy escape cover due to sheared foredune ridge, and the narrowness of the beach.

Two exclosed nests on the Refuge were predated by crows; these nests were within 0.2 miles from each other. It was evident that the single-strand, parallel string along the top of the exclosure was not effective in deterring avian predators. The Refuge

experimented with different mesh netting to alleviate this predation including: a one-inch mesh shrimp netting; 3/4-inch garden netting; and double stringing the top of the exclosure to form four-inch mesh. Of the three, the garden netting was preferred because of its effectiveness, ease in setting up, and relatively low cost. The shrimp netting was too heavy and cumbersome, and double-stringing the top took more time to string and did not maintain a four-inch mesh when the wind was blowing. In addition to a mesh netting over the top of exclosures, State Biologist Scott Melvin recommended a circular predator exclosure rather than the current triangular style. The circular exclosure is just as effective, yet would be lower in cost and could be erected in less time. These changes will be made during the 1995 nesting season.

Predator exclosure for nesting piping plovers showing mesh netting used to eliminate avian predators. (Springfield, 8/94)

Least terns, a species of special concern in Massachusetts, experienced an unsuccessful breeding season in 1994 with the first tern observed on May 20. Tern decoys were used and appeared to be an attractant. A predator exclosure for terns was erected on June 21 and enclosed the berm (with 10 nests) from above high water line to the foredune, from 0.57 to 0.75 miles. A total of 26 pairs were recorded during the State's standardized census window for the colonial waterbird survey, June 5-15. However, the maximum number of least tern pairs (28) was recorded on June 17. A few

unexclosed nests hatched whereas a majority of exclosed nests hatched successfully. The colony produced a minimum of 30 chicks and fledged 13. All known nest losses were due to predation, primarily red fox and crow. Overwash did not account for any known nest losses this year. Most terns had departed by mid-August; however, a few stayed until late August.

3. Waterfowl

Waterfowl surveys (see Table 6) were conducted weekly during migration and bi-weekly at all other times. Consistency has been maintained since 1988 by volunteers Bill and Phyllis Drew, Skip Charette, Lois Cooper, and others. Adverse winter weather precluded surveys from January 1 to March 22, with the first bird survey conducted on March 23! Problems previously discussed in the wetlands section may have contributed to low waterfowl use of Refuge impoundments.

Due to the icy/snow conditions on the Refuge during the winter months, we do not have the necessary data to determine peak abundances for wintering waterfowl. By the time the road was accessible and volunteers could survey (March 23), winter was on its way out and the spring migration was just beginning. During late March/early April, the majority of birds observed were: American black ducks (maximum count=345) and Canada geese (269). However, these counts appear lower than those recorded during the same time period last year. As in previous years, bird abundance typically tapers off during March/April as birds fly further north to breeding ground areas. The lower counts in 1994 may be attributed to the severe winter conditions which caused the Refuge pools and salt pannes to ice-up throughout most of the winter. A diversity of diving and sea ducks were recorded in bays and offshore areas.

The spring migration began in March and continued into April with Canada geese, American black ducks, gadwall, mallard, northern pintail, blue- and green-winged teal, and American wigeon present. Diving and sea duck species included: white-winged scoter, common goldeneye, common eider, bufflehead, hooded and red-breasted merganser, ring-necked ducks, and greater scaup. Common loons and horned grebes were also present during this period.

A breeding pair survey of Refuge impoundments was conducted on the evening of April 28. A total of 51 breeding pairs were observed compared to 67 in 1992 and 41 in 1993. Not all pairs present may have been accounted for due to high water levels in all the impoundments. Similar to 1993, North Pool supported the largest number of pairs and greatest diversity of species (36 pairs, 6 species); however, in contrast, a greater number and higher diversity was observed in Bill Forward Pool (9 pairs, 5 species) than Stage Island Pool (6 pairs, 4 species). American black duck (13 pairs) and gadwall (11 pairs) were the predominant species (25.5% and 21.6% of all pairs recorded, respectively) with slightly

fewer mallard (9) and blue-winged teal (9) comprising 17.6% of all pairs respectively. The number of pairs observed for other species were: green-winged teal (7), wigeon (1), and bufflehead (1). Although counted on the survey, bufflehead do not nest on the Refuge.

A brood survey of Refuge impoundments was conducted on the evening of July 6. Waterfowl productivity on the Refuge has fluctuated within the past three years with six broods in 1991, twelve in 1992, and nine in 1993. However, this year we recorded a total of 23 broods and 129 young. Unlike last year, broods were recorded within all impoundments with a majority of the broods located in North Pool (13 pairs/78 young) followed by Stage Island (6 pairs/28 young) and Bill Forward Pools (4 pairs/23 young). Species observed included gadwall (12 pairs/65 young), mallard (7 pairs/45 young), American black duck (3 pairs/18 young), and American green-winged teal (1 pair/1 young). The relatively low waterfowl productivity may be attributed to a variety of factors, including the monotypic stands of pest plants (*Phragmites* and purple loosestrife) which provide no food value for waterfowl, and the on-going pest plant control program to reduce these plants. This program has resulted in reduced vegetation availability for the short term during the control program. Once control of pest plants is achieved, native vegetation can recolonize the treatment areas and productivity should increase substantially. Another contributing factor is a high population of predators, particularly fox and skunk, and the corresponding predation on eggs and young. Raccoon and opossum may also represent a significant factor.

The wood duck nest box program consists of seven boxes located in potential wood duck habitat. A wood duck nest box check conducted by volunteers revealed other bird species were using the nests instead of wood ducks (possibly starlings). Wood duck broods have been observed in the impoundments in previous years (e.g., 1993) as well as this year when one was recorded on the weekly bird survey; however, they did not nest in the Refuge's boxes. Further investigation of wood duck nest box usage may need to be conducted to determine the value of these boxes to wood ducks versus other species (starlings).

Once again the Refuge was host to four whooper swans this year. They frequented the Refuge from April to early December. Bird surveys and follow-up checks of impoundments did not reveal any nesting activity of these birds. These swans are believed to have escaped from a private collector on Long Island, New York.

The fall waterfowl migration began in late August and reached its peak in early November. The greatest abundance was recorded on November 4 revealing a total of 25 waterfowl species: 2,743 American black ducks, 495 white-winged scoter, 227 American coot,

TABLE 6: 1994 WATERFOWL SURVEYS

Peak and average waterfowl abundance at Parker River NWR, 1994 (Notes: no surveys were conducted during January and February due to weather conditions; data represent peak abundance/average abundance per survey each month).

Species	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Mute Swan	0	4/2	4/2	7/2	3/1	1/0	2/1	8/4	13/5	2/0
Whooper Swan	0	2/0	5/3	4/3	1/1	2/0	2/0	2/1	2/0	2/0
Brant	0	0	47/19	0	0	0	0	0	0	0
Canada Goose	271/199	75/63	86/51	154/138	190/188	109/73	261/132	441/255	380/275	460/237
Snow Goose	0	0	0	0	0	0	0	21/14	17/6	15/7
Bar-headed Goose	0	0	0	0	0	0	0	1/0	0	0
Am. Black Duck	346/283	152/82	25/15	25/11	10/5	103/37	255/166	860/500	2743/1206	2740/1566
Gadwall	9/8	8/5	19/10	26/14	63/59	95/40	35/26	58/17	8/5	3/0
Mallard	20/18	10/6	22/12	43/28	51/39	188/117	162/100	75/51	54/36	37/27
No. Pintail	25/21	38/12	0	0	0	0	2/0	60/29	65/38	21/6
No. Shoveler	0	2/0	0	0	0	0	4/2	0	0	0
Bl-winged Teal	0	21/15	12/8	7/4	0	0	22/11	0	0	0
Am. Gr-wing. Teal	41/26	76/43	14/5	4/2	0	57/17	420/193	180/123	170/132	41/14
Wood Duck	0	0	0	0	1/0	0	1/0	0	0	0
Am. Wigeon	8/4	37/11	2/0	0	4/2	2/0	63/24	86/41	7/2	3/1
Eurasian Wigeon	0	1/0	0	0	0	0	0	1/0	0	0
Bufflehead	20/16	20/15	2/0	0	0	0	0	1/0	55/32	80/36
Common Goldeneye	54/33	10/2	0	0	0	0	0	0	0	34/9
Ruddy duck	0	0	0	0	0	0	0	1/0	2/1	0
Common Merganser	0	0	0	0	0	0	0	0	40/10	0
Hooded Merganser	14/8	3/0	0	0	0	0	0	4/1	6/1	0
Rd-Br. Merganser	29/25	22/8	6/1	0	0	0	0	15/3	85/25	6/2
Ring-necked Duck	11/8	27/11	0	0	0	0	0	0	0	0
Lesser Scaup	0	0	0	0	0	0	3/0	4/2	9/3	0
Greater Scaup	1/0	0	0	0	0	0	0	0	38/9	0
Common Eider	45/24	0	0	0	0	0	0	100/25	40/12	394/131
Oldsquaw	0	0	0	0	0	0	0	0	8/2	28/8
Surf Scoter	0	0	0	0	0	0	0	6/0	87/22	2/1
Wh-winged Scoter	105/95	25/6	0	0	0	0	0	500/163	495/158	96/49
Common Scoter	0	0	0	0	0	0	0	0	0	28/7
Am. Coot	0	0	0	0	0	0	1/0	23/14	227/145	125/43
Dbl-cr. Cormorant	0	15/9	176/60	91/38	51/35	34/27	205/88	200/77	10/0	0
Horned Grebe	7/4	0	0	0	0	0	0	1/0	6/1	56/19
Pied-bill Grebe	0	0	0	0	0	0	6/3	12/9	13/4	0
Rd-necked Grebe	0	0	0	0	0	0	0	0	0	0
Common Loon	10/6	3/0	2/1	0	0	3/0	3/0	4/1	9/4	12/4
Rd-throated Loon	0	0	1/0	0	0	0	0	1/0	25/7	0
TOTALS Peak	1,016	551	423	361	374	594	1,448	2,664	4,614	4,185
TOTALS Average	778	290	187	240	330	311	746	1,330	2,141	2,167

and 25 red-throated loon, as well as other species previously mentioned. At the end of the year, American black ducks (2740/survey) and Canada geese (460/survey) were still numerous and sea duck abundance was increasing (e.g., 394 common eider).

Throughout 1994, volunteers reported a total of 35 waterfowl species on the Refuge. Noteworthy observations this year included one Eurasian wigeon (observed in Bill Forward Pool in April and October), two bar-headed geese (September), and two ruddy ducks (late October and November).

4. Marsh and Water Birds

Marsh and water birds utilized Refuge pools and salt marsh pannes throughout much of the year. Typical summer residents included great and snowy egrets, glossy ibis, and herons (black-crowned night heron, great blue, green heron and little blue herons). Snowy egrets were the most prevalent species with a peak of 155 recorded. Noteworthy observations included American bittern, tricolored heron, and yellow-crowned night heron. (The yellow-crowned night heron is at the northern limit of its range.)

In July, a common moorhen brood at Stage Island was confirmed. This was a rarity, and may be the only recorded nesting in Massachusetts!

5. Shorebirds, Gulls, Terns and Allied Species

The Refuge provides an important stopover for a diversity of shorebird species, particularly during the fall migration. These shorebirds concentrate on the Refuge beach and salt pannes of the *Spartina* marsh. They also utilize mudflats exposed as water levels decline throughout the summer in the impoundments.

The spring migration is not as substantial as the fall migration due to the elliptical migration pattern exhibited by shorebirds at this northern region - spring migration is typically more inland whereas fall migration is along the Atlantic coast. During the spring migration, the majority of migrant shorebirds on the Refuge are greater yellowlegs (42 birds/survey). In addition, least sandpipers, willets, black-bellied plovers, semipalmated plovers, and Wilson's phalaropes are frequent visitors. Killdeer arrive early with some staying on the Refuge to nest. Killdeer nests were found along the dike and front beach; however, only one is known to have hatched young and fledged one chick (beach). Other nests were lost, probably from mammalian predation. In mid-April, volunteers observed one common snipe and one American golden plover on the

Refuge. Volunteers were not able to survey the beach from April 1 to August 13 due to the beach closure (to protect nesting piping plovers); therefore, counts for shorebirds that typically use the beach (e.g., sanderlings) are less than the actual abundance recorded during this period.

The Atlantic Coast Colonial Waterbird Survey was conducted on May 19 (gull species) and June 8 (tern species). In May, the Refuge portion of Thatcher Island (approximately one-third of the island) was surveyed. A lot of tip-toeing, guano rain, and brush-wacking transects revealed totals of 158 pairs of great black-backed gulls and 395 pairs of herring gulls. A walk around the entire island revealed similar nesting abundance on the remaining two-thirds of the island. The island is surveyed infrequently due to time and staff constraints; the last survey for nesting birds being conducted in 1989.

Rough terrain and guano rain made surveying a challenge at Thatcher Island, Rockport, MA. (Springfield, 5/94)

Herring gull chicks were just beginning to hatch at Thatcher Island NWR. (Springfield, 5/94)

The census window for common tern nesting was in June. A total of 248 common terns were recorded in the Plum Island Sound waterway (including Parker River) and tributaries. This area was one of the 36 common tern nesting colonies located along the Atlantic coast this year (there are a total of 107 known nesting areas).

The fall shorebird migration occurred from mid-July to mid-October with a diversity of 21 species observed. The first volunteer bird survey on the beach was conducted on August 24, after the entire beach was reopened to the public. The highest abundance of shorebirds recorded on a single survey occurred on August 17 with a total of 1,428 birds. Predominant species and their maximum abundance recorded on an individual survey (excluding beach) included: semipalmated sandpiper (840), semipalmated plover (290) lesser yellowlegs (108), short-billed dowitcher (121), white-rumped sandpiper (79), greater yellowlegs (69), black-bellied plover (60), and least sandpiper (60). Other species recorded infrequently during the fall migration: spotted sandpiper (8), Baird's sandpiper (2), pectoral sandpiper (2), and buff-breasted sandpiper (1). Dunlin, which migrate later in the fall, peaked on October 18 when 236 birds were recorded.

Herring, black-backed, and ring-billed gulls continue to be the predominant gull species. Notable sightings included 110 Bonaparte's gulls on September 30 and four laughing gulls on August 12. Least tern and common tern were the predominant tern species on the Refuge. A notable sighting occurred at the end of May when one gull-billed tern was observed over the marsh.

6. Raptors

The mid-winter bald eagle survey was conducted on January 15. Three bald eagles were sighted, one of which was an immature and two were of unknown age. Due to the snow/ice conditions, the Refuge was not accessible by vehicle; therefore, it was not surveyed this year.

Once again, at least one snowy owl visited the Refuge periodically over the winter. Northern harriers, red-tailed hawks, and American kestrels were present all year and rough-legged hawks, merlins, and peregrine falcons occurred on the Refuge during spring and fall migrations.

Ospreys were observed on the Refuge and even visited the Refuge nesting platform; however, no nesting activity occurred at either the Cross Farm Hill or Nelson's Island platform. In recent years, osprey have been expanding their range to the north shore from the well-established south shore population. It is hoped that they will eventually nest on the Refuge.

No nesting activity occurred in the two American kestrel nest boxes located at Sub-headquarters and Stage Island.

The Eastern Massachusetts Hawk Watch (EMHW) conducted a spring migration survey from April 15 to May 9. The maximum number of raptors recorded on a survey during this period for each species was: 209 American kestrels, 42 sharp-shinned hawks, five merlins, four Northern harriers, four ospreys, three turkey vultures, and one each of broad-winged hawk, red-tailed hawk, Cooper's hawk, and peregrine falcon. The EMHW does not conduct surveys during the fall migration because raptors are not as significant as in the spring.

7. Other Migratory Birds

The Christmas Bird Count was conducted on December 26. A record (since 1985) of 72 species were recorded! There were record counts of American black ducks (3651), mallards (209), northern pintails (45), common eiders (212), yellow-rumped warblers (141), dunlins (55), song sparrows (38), surf scoters (34), American coots (10) downy woodpeckers (7), razorbills (6), golden-crowned kinglets (5), to name a few. In addition, five species were recorded for the first time during this specific count: seven hooded mergansers, six black-bellied plovers, one American pipit, one killdeer, and one common yellow-throat.

Several small flocks of snow buntings were observed over the winter. The spring warbler migration peaked in mid-May. Other spring migrants included red-winged blackbirds, savannah sparrows, tree swallows, eastern meadowlarks, and bobolinks. As in previous years, bobolinks nested in the fields at Cross Farm Hill, Stage Island, and Nelson's Island. Horned larks, which are observed throughout the year in small flocks, also nest on the Refuge in limited numbers. Throughout August, thousands of tree and bank swallows staged for the fall migration.

A Wildlife Inventory Management Plan was developed and implemented by the North Zone Biologist, Janith Taylor. The encompassing objective of this Inventory Plan is to provide a comprehensive program for monitoring population trends of passerine landbirds on refuge lands. These data will contribute to national landbird monitoring programs and will determine the status of passerine landbirds on this and other refuges. The information collected under the objectives of this Plan will be useful in evaluating wildlife response to habitat changes on the Refuge and subsequently used to refine Refuge management objectives and techniques. The field work/data collection were collected by a temporary Biologist, Jennifer Leak, who is currently in the process of analyzing these first-year data and will submit a progress report in the near future.

Purple martin nest boxes were erected in early April and removed for winter storage in late September. A total of 80 purple martins nested in the 12 boxes located on the Refuge. In addition, 21 house sparrows also took advantage of the condos. Fewer dead purple martin chicks (4) were found than last year (22).

Bluebird/tree swallow nest boxes were examined and revealed six of the nine boxes had tree swallow nests; this is four more nests than last year.

Noteworthy sightings this year included a Connecticut warbler in September and an immature red-headed woodpecker (for approximately one week) during mid-November.

8. Game Mammals

The Refuge is currently developing a White-tailed Deer Management Plan with consultation from North Zone Biologist Janith Taylor. This Plan incorporates various surveys/monitoring techniques to assess the use of the Refuge by deer and will include aerial surveys, spotlight counts, vegetation monitoring, and necropsies (during the controlled hunts). All these data will determine relative indices for year-to-year comparisons.

The 1993/1994 winter aerial deer survey was conducted on January 6 via a Wiggins Airways (Norwood, MA) Bell Ranger helicopter. A total of 36 deer and 9 red fox were recorded. This count was greater than the previous three winter counts: 31 deer in 1991/92 survey, 26 in 1990/91, and 27 in 1989/90.

Fall spotlight deer surveys were conducted from September 8 to November 16. The maximum number recorded on a single survey was 27 deer. The doe:fawn ratio, based on the 101 does and 35 fawn observed is 1:0.35. The doe:buck ratio, based on 101 does and 14 bucks observed is 1:0.14. These counts may be skewed (toward the minimum) because Refuge fields had not been mowed prior to the surveys, making it difficult to see the deer, particularly fawns.

9. Marine Mammals

In the spring, ARM Drauszewski and BIO Springfield visited the New England Aquarium in Boston for a workshop covering the identification, natural history, and ecology of the various seals frequenting waters in this area. They also received a marine mammal identification book which has been helpful in identifying seals that come ashore on the Refuge beach.

10. Other Resident Wildlife

A predator scent station survey was conducted on October 5, with a total of 20 stations throughout the Refuge. Nine of the 20 stations were visited by foxes, two by skunks, and one by a raccoon. In addition, birds, mice, and deer were visitors to the stations. The number of foxes increased over last year when they visited five of the 20 stations.

Red Foxes were prevalent residents throughout the year. (Drauszewski, 10/94)

15. Animal Control

A few individual animals on the Refuge had to be trapped and disposed of due to competition and predation pressures on waterfowl. Mute swans were sighted on the Refuge at the beginning of the waterfowl nesting season and monitored closely by Refuge staff. All three pools were searched in an effort to locate any nests; no nests were found. Later in the season, a pair of swans with cygnets was observed in Stage Island Pool. In July, two adults and three of the four cygnets were euthanized. This species is extremely territorial, particularly during the breeding season, and tends to displace other waterfowl species in the area. Careful monitoring and nest searching will be conducted in future years.

During the pre-season waterfowl banding period in August, three raccoons, suspected to be depredating waterfowl at banding sites, were euthanized. Traps were located adjacent to the waterfowl banding site at Forward Pool where 12 ducks were lost.

16. Marking and Banding

The annual goose roundup on June 30 went very smoothly with the assistance of staff and approximately 30 dedicated volunteers. Three canoes were used to drive the geese from the middle of North Pool to the corral/banding site located at the south end of Bill Forward Pool. A second roundup was conducted at the north end of North Pool after another "herd" of geese was seen. Of the 76 geese handled at both sites, 35 were recaptures and 41 were newly banded. Twenty-five of the first-time-captured birds were males, 16 were females. In addition, hatch-year birds (27) comprised almost twice the number of after-hatch-year birds (14). It is a great advantage having "young" volunteers who are quick on their toes and can sustain strenuous running!

A well-orchestrated goose roundup with numerous "young" volunteers to assist! (Martinkovic, 7/94)

Pre-season waterfowl banding commenced August 17 in North Pool and August 27 in Bill Forward and Stage Island Pools and continued until September 15. Two walk-in traps were located at North and Forward Pools, and one swim-in trap was located at Stage Island Pool. The walk-in traps were protected from predators by electric fencing. Fourteen birds in these walk-in traps were lost; 13 to raccoon and one trampled. The losses occurred at both sites on only a couple of different occasions. Live traps were used to remove animals that had learned to bypass the electric fence (see animal control section).

Swim-in trap at Stage Island during pre-season duck banding (Springfield, 8/94)

Operations Specialist Nakai banding a "lap-size" duck. (Haydock, 9/94)

The trapping effort resulted in the banding of 353 ducks (see table below). The Refuge quota of 200 American black ducks was not met this year; perhaps due to the time of year that we conduct our banding program. Additional information will be obtained from the Migratory Bird office to determine whether our quota is set too high (for the period of time when we are banding) or if we should extend our banding season.

TABLE 7: PRESEASON WATERFOWL BANDING

Species	Number Banded
Mallard	232
American Black Duck	89
Black Duck-Mallard Hybrid	4
American Green-winged Teal	24
Blue-winged Teal	2
Northern Pintail	2
Total Number Banded	353

Next year, additional swim-in traps will be constructed and used during pre-season banding to further minimize trap loss due to predation.

H. PUBLIC USE

1. General

The Refuge recorded 258,643 visits during 1994. Compared to 1993 figures (275,200), this represents a 6% decrease. However, this is in part explained by the use, beginning in October, 1994, of an adjusted multiplier for the average number of people per vehicle. The figure 2.85 was previously used to determine visitation (2.85 x number of vehicles). Data from a public use survey conducted in 1993/94 by Laura Gilbert of the University of New Hampshire, indicated the need for an adjustment to 2.4. Given this factor, the Refuge experienced only a 2% drop in visitation. This may in part be explained by the exceptionally large number of mosquitoes the Refuge experienced during August, September, and even October. Still, warm weather, fall migration, an open beach, and few greenhead flies attracted 42,000, 32,200, and 26,280 visits, respectively, during these most popular months (see table 8).

Always popular, the Refuge recorded over 250,000 visits during 1994. (Haydock, 11/94)

User fees totaled nearly $154,000 for 1994. This figure represents receipts from the sales of surf fishing and other recreational user permits, Duck Stamps, Golden Eagle and Age Passports, and daily entrance fees. Duck Stamp sales dropped approximately 9% compared to 1993 with 3,120 sold. The new popularity of the Golden Eagle

Passport may in part explain this decline. Unlike previous issues that were valid for the calendar year, the new pass is good for 12 months from the month of purchase. Four hundred Golden Eagle Passports were sold in 1994 compared to only 145 in 1993. Unfortunately, our supply was exhausted in October and, due to a printing error, none were available until late December. Beginning January 1 of this year, a one-time fee of $10 was charged for the Golden Age Passport. Three hundred thirty-one new Golden Age Passports were issued in 1994.

Parker River Refuge participated in Newburyport's Winter Festival from March 3-6. Refuge-sponsored activities included an astronomy program, a guided birding tour, horse-drawn hayrides, a scavenger hunt, and animal tracking.

The second annual "Plover and Wildlife Festival" was held from May 12 - May 15 and was a great success. Sponsored by the Friends of Parker River National Wildlife Refuge, the four-day event attracted over 1,500 people, including the Mayor of Newburyport, the President of the Newburyport Chamber of Commerce, and State Representative Frank Cousins. The Festival was celebrated at various locations within the community with activities including nature walks, interpretive programs, artistic demonstrations, boat trips, and hayrides.

Numerous dignitaries were recognized and participated in the second annual Spring Plover and Wildlife Festival. (Fillio, 5/94)

Wildlife-oriented activities for children were both available and popular at the second annual Spring Plover and Wildlife Festival. (Martinkovic, 5/94)

The Refuge once again entered a float into Newburyport's Yankee Homecoming Parade on August 7. Its construction was coordinated by ROS Glynnis Nakai with assistance from other Refuge staff and volunteers.

The Refuge float, with a theme "Volunteers Make the Difference", captured second prize in the non-commercial category!! (Solazzo, 8/94)

In September, the Refuge received and made available to the public, a small, but adequate supply of the large-print version of our general brochure.

A visitor survey was conducted at the Refuge from June, 1993 - May, 1994 by Laura Gilbert in partial fulfillment of the requirements of a Master of Science degree from the University of New Hampshire. The first draft was received by the Refuge in September with results both interesting and useful. Visitors, for example, were generally, "...supportive of current wildlife protection strategies including the seasonal beach closure, rated their experience positively, and indicated an understanding of the trade-off between wildlife protection and human recreational demands." Average (mean) visitor characteristics included: age, 43; household income, $40,000 - $50,000; length of stay, 150 minutes; party size, 2.4; number of years visiting Refuge, 11; number of visits per year, 5-12. Seventy-seven percent of the visitors were Massachusetts residents of which 57 percent were from Essex County. Thirty-nine percent of the respondents indicated their primary purpose for visiting the Refuge was for wildlife observation.

2. Outdoor Classrooms - Students

During 1994, the Refuge provided educational services for 4,445 students representing approximately 100 visits by many different educational institutions. Of this former figure, 4,250 were non-staff conducted. Fourteen staff conducted presentations on diverse wildlife-related topics were made during the year involving 195 students from various schools and youth group organizations.

4. Interpretive Foot Trails

Hellcat Swamp Nature Trail is interpreted by the leaflet and marker method and is the Refuge's only interpretive trail. Due to the beach closure and the rerouting of a trail section and associated boardwalk construction, the dune loop segment was closed from April through mid-August. Plans for 1995 include a leaflet rewrite and new numbered marker posts.

5. Interpretive Tour Routes

Currently, the Refuge has no interpretive tour routes or wayside exhibits and many visitor questions, therefore, go unanswered. In 1995, however, a three-panel orientation kiosk will be constructed near parking area #1 which will prove especially valuable when the entrance gatehouse and Visitor Contact Station are not staffed. Planning will also proceed for additional wayside exhibits at high volume public use areas.

6. Interpretive Exhibits/Demonstrations

Due to the availability of volunteers, the Refuge Visitor Contact Station was open 69 days for several hours each day from June 18 - October 10. During this time, 777 visits were tallied. For special events in April and May, the VCS was open for several days and an additional 245 visits were recorded.

7. Other Interpretive Programs

ORP Haydock made several interpretive presentations during the latter half of the year including a program on raptors to 50 local Rotarians and introductory Refuge talks to 37 visiting senior citizens from the Fox Hill Retirement Center and the Danvers Senior Citizen Club.

The Friends of Parker River National Wildlife Refuge sponsored a "Star Party" on October 8. This astronomy program involved a slide presentation and opportunities to telescopically view Mercury, Saturn, and other notable celestial bodies with amateur astronomers from the North Shore Astronomy Club serving as interpreters. This program was well received with more than 100 people of all ages in attendance.

The Refuge is a popular area for conservation organizations such as Massachusetts Audubon and the Brookline Bird Club to conduct naturalist-led birding and other interpretive programs. Approximately 50 programs were conducted involving an estimated 750 people.

8. Hunting

Waterfowl hunting continued on the western (salt marsh) portion of the Refuge during the State's open seasons. No deer hunt was conducted this year, based on current abundance indices.

a) Youth Waterfowl Hunt

On September 25, MW Burke and ORP Haydock served as instructors at the Danvers Fish & Game Club for the annual Youth Waterfowl Hunter Training Program sponsored by the USFWS and the League of Essex County Sportsmen's Clubs. Open to persons 15 - 18 years of age, the program aims to instill a sportsmanship ethic, increase hunter skills, and includes sessions on safety, clothing and other gear, regulations, waterfowl identification, and the use of decoys and dogs. Despite a comprehensive recruitment effort, only five youths participated.

The program also involves an opportunity to waterfowl hunt at the Refuge along Plum Island Sound's eastern shore. On October 22, with adult supervision, all five youths participated, bagging three American black ducks, two Canada geese, and one snow goose.

b) Waterfowl Hunt

Similar to the past six years, this year's waterfowl harvest for the coastal zone was split into two seasons: the first season ran from October 20 to October 29 and the second season ran from November 25 to December 24 for ducks and to January 20, 1995 for geese. A "permit-only" Canada goose season will be allowed for an additional two weeks in January 1995.

Waterfowl hunting is only permitted on the western salt marsh portion of the Refuge. One area is only accessible by boat (Area A) while the other two are walk-in areas from Refuge parking lots (Areas B and C).

TABLE 8: SUMMARY OF WATERFOWL SPECIES HARVESTED

Species	Number Harvested	Number Crippled
Amer. Black Duck	48	12
Canada Goose	16	2
Green-winged Teal	13	1
Mallard	10	3
Bufflehead	3	1
Common Goldeneye	2	1
Hooded Merganser	2	0
Total Harvested	94	20

The number of hunters, hunting hours, and birds harvested are estimates based solely on information obtained from the daily waterfowl harvest information sheets which are available at the three waterfowl access points and completed by hunters on a voluntary basis. Thus, recorded hunter visits and harvest levels are probably lower than the actual number. Based on the 136 harvest information sheets completed by hunters, there were 242 hunters using the Refuge's hunting areas. Of these hunters, 53.3% hunted in Area C (Stackyard Road) and 40.9% hunted in Area A. Approximately 74.3% of all hunters on the Refuge were repeat users, having previously hunted on the Refuge this season. All hunters contributed a total of 873 hours of hunting, which calculates to 3.6 hours per hunter. The number of hunters reported this year was an increase over last year (101 hunters); however, this may be due to hunters' increased voluntary effort in completing harvest information forms. Unfortunately, only close daily monitoring will enable us to thoroughly investigate use of the Refuge by waterfowl hunters.

9. Fishing

The Refuge Surf Fishing Program involved an estimated 2,954 visits during 1994. Striped bass and bluefish are two of the more sought after species and, by many verbal accounts, the season was good.

Surf fishing access is not permitted before July 1 to provide undisturbed nesting habitat for the Federally threatened piping plover and least tern. Beginning July 1, walk-on access only is allowed to those areas where these species are not nesting. Once the entire Refuge beach is reopened, usually sometime in August, drive-on access is also permitted. A permit system regulates access and has the following associated fees: 24 hour walk-on, $5; 24 hour drive-on, $15; 72 hour drive-on, $25. A total of 340 permits were issued in 1994 with the season closed on November 30.

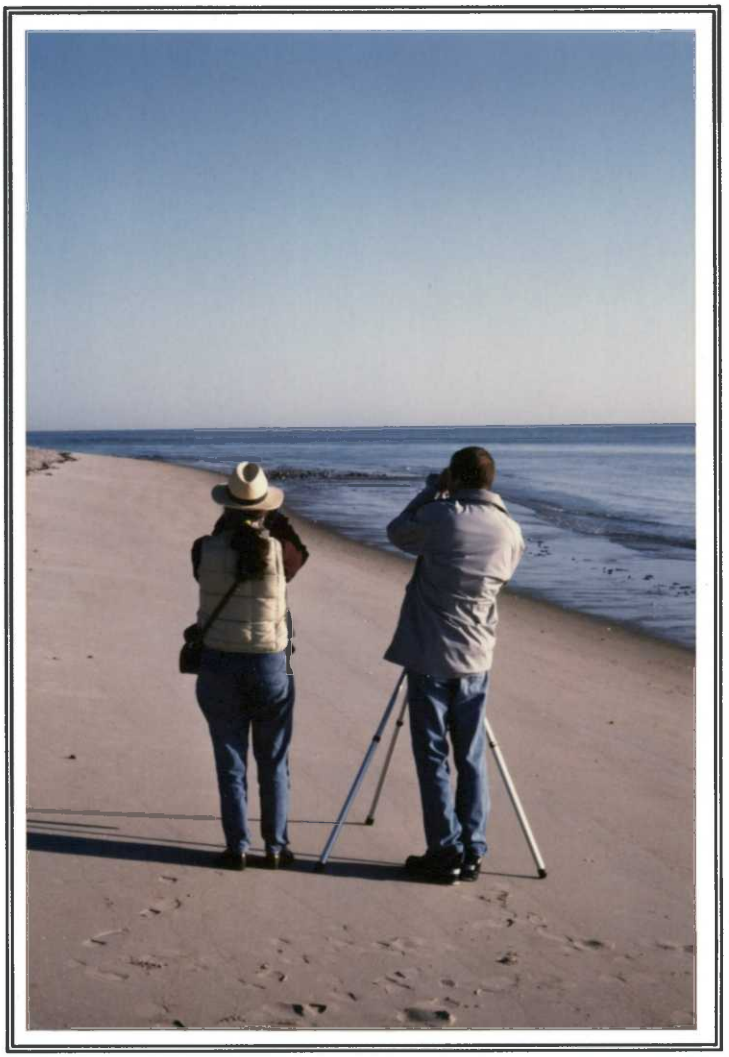
Table 9: Monthly Surf Fishing Permit Issuance

MONTH	24 HOUR WALK-ON	24 HOUR DRIVE-ON	72 HOUR DRIVE-ON	TOTAL
JULY	60	20	6	86
AUGUST	50	76	27	153
SEPTEMBER	23	49	8	80
OCTOBER	12	9	0	21
NOVEMBER	0	0	0	0
TOTAL	145	154	41	340

Shellfishing on Refuge tidal flats for the soft-shelled clam, *Mya arenaria*, is another popular activity. An estimated 3,944 commercial and recreational visits occurred in 1994. A Refuge permit is required and is issued free to those possessing a valid Newbury, Rowley, or Ipswich clamming license. Fifty-six commercial and 68 recreational Refuge shellfishing permits were issued in 1994.

11. Wildlife Observation

Wildlife observation is a very popular recreational activity at Parker River Refuge. An estimated 100,871 visits were made for the primary purpose of observing birds and/or other wildlife.



Thirty-nine percent of the respondents to a Refuge-sponsored visitor survey indicated their primary purpose for visiting the Refuge was for wildlife observation. (Haydock, 9/94)

12. Other Wildlife-Oriented Recreation

People also engaged in botanizing, berry picking, and wildlife photography on the Refuge, but in much fewer numbers than wildlife observation.

14. Picnicking

Picnicking occurs as an incidental activity on the Refuge. No facilities are provided.

15. Off-Road Vehicling

While the Refuge has no Off-Road Vehicle (ORV) Program, ORV use is permitted in conjunction with the Surf Fishing Program (see Section H.9 for further information).

16. Other Non-Wildlife Oriented Recreation

Although the Refuge beach was closed to all public entry from April 1-August 11, beach-use activities still accounted for a significant proportion of Refuge use. An estimated 75,006 visits were made for the primary purpose of sunbathing, swimming, and beachcombing.

In less significant numbers, people also visited the Refuge to bicycle, walk for exercise, jog, cross country ski, and meditate.

17. Law Enforcement

The full-time Law Enforcement Officer position was filled July 10, 1994 by T.J. Donovan, formerly with the National Park Service. Two seasonal Officers, Sue Becker and Brian Liening, were hired during the period April 17 through October 1, 1994. Law enforcement duties were also conducted by ARM Frank Drauszewski and BIO Bob Springfield on an as-needed basis.

The summer months were once again our busy time of year. Thanks to the assistance of our vital Volunteer Plover Wardens, trespassing incidents were limited during the piping plover beach closure.

Major 1994 issues were reports of suspicious persons harassing visitors. There were eight reported incidents involving men acting lewd and lascivious around female visitors on the dune edges. One incident resulted in an arrest by a Massachusetts State Environmental Police Officer (assisted by BIO Springfield) on disorderly conduct charges.

During the dates of July 10 through October 23, 1994, six motor vehicles were broken into with larcenies of money and property.

In response to the suspicious activity and car-clouting incidents, Refuge Law Enforcement Staff increased patrols in these areas. Staff also began plain-clothes patrols during peak times and in the areas where reports were being received. These incidents happened during busy summer days. Law enforcement staff will increase high-visibility patrols and perform surveillance of the identified "hot spots" for the summer of 1995.

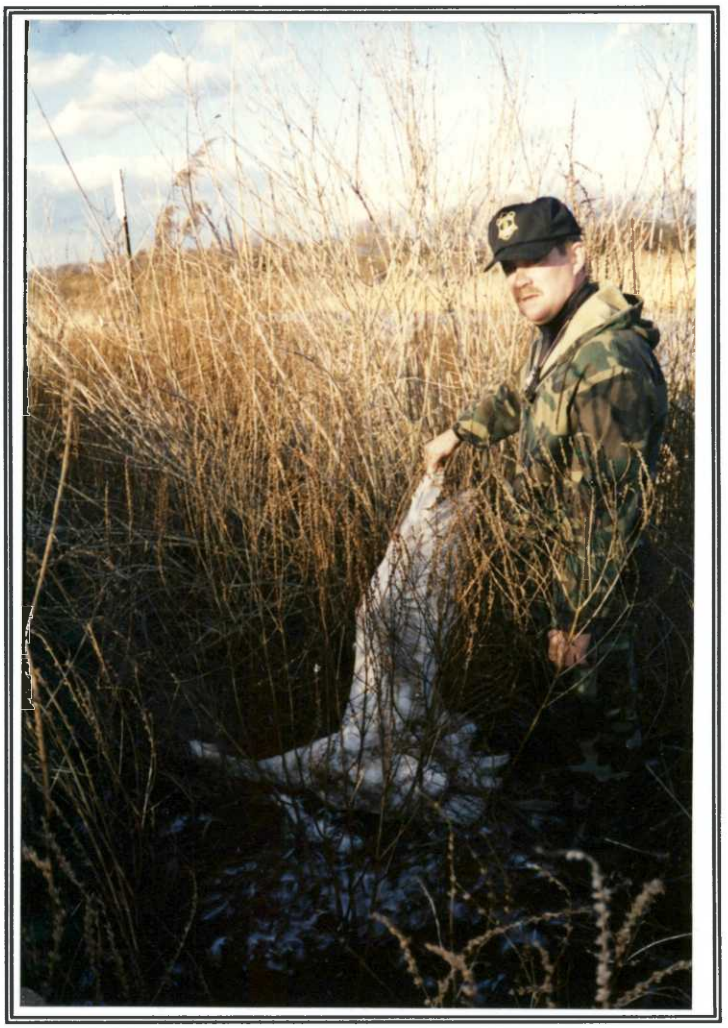
The waterfowl hunting season was busy, as the Refuge did not have seasonal Officers. One full-time Officer and two collateral-duty Officers performed compliance checks, surveillance, and hunting patrols from opening day on October 6 through the end of the year. Over 150 hunters were contacted, with an overwhelming majority of compliance being reported.

Violations included: unsigned duck stamp (5), species identification removed (2), lead shot (1), and Refuge-specific regulations (2). Hunting patrols were conducted by Refuge staff and with the cooperation of State Environmental Police Officers (EPO).

Agency cooperation is vital to our LE Officers. (Becker, 9/94)

U.S. Fish and Wildlife Special Agent Pat Bosco (Boston) held an informative one-day training session on waterfowl identification attended by Refuge staff, State EPO's, State Police and FWS Special Agents.

U.S. Fish and Wildlife Special Agent Chris Dowd continued to successfully prosecute Refuge cases in Federal court. Court cases included abandoned property, motor vehicle violations and Refuge-specific violations.



Investigating "fowl" play with a Massachusetts Environmental Police Officer. (Donovan, 11/94)

Parker River has continued to cultivate professional relationships with local, State, and Federal law enforcement and emergency service agencies. Law enforcement staff worked closely with the Massachusetts Environmental Police (State Fish and Game Agency) and with the local town police departments (Newburyport, Newbury, Rowley and Ipswich).

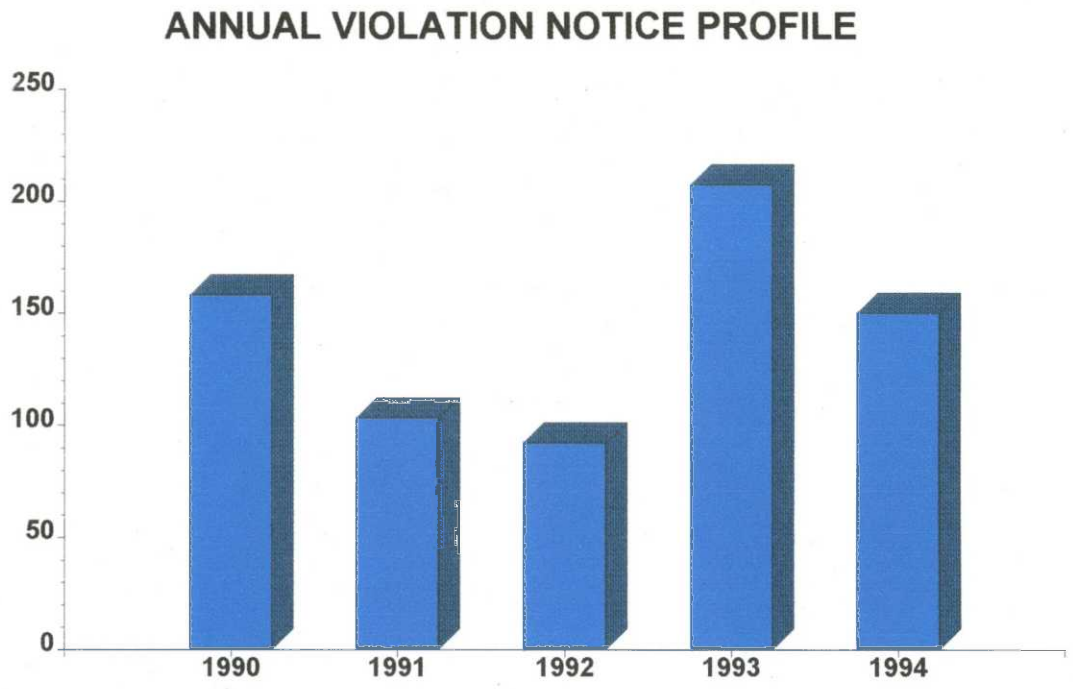
A variety of law enforcement training was attended by Refuge staff. PARM Martinkovic, ARM Drauszewski, ROS Nakai attended "Prosecuting Petty Offenses" at Cape Cod National Seashore. RO Donovan attended the 80-hour Refuge Officer Basic School at F.L.E.T.C. ARM Drauszewski attended the annual in-service at Eastern Shore.

Regional Office staff visited Parker River for a Law Enforcement Inspection. Their comments and advice will be incorporated as the full-time Officer upgrades the Refuge Law Enforcement Program.

1994 Incident Report Profile:

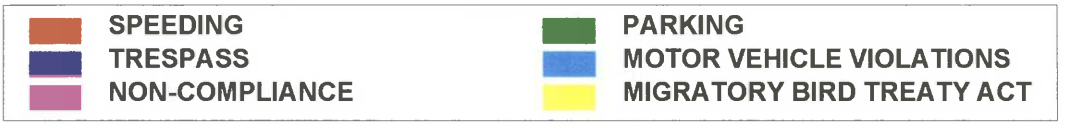
11 Incidents of Assist to Law Enforcement Agency
8 Incidents of Suspicious Activity
6 Incidents of Larceny from a Motor Vehicle
4 Incidents of Trespassing
4 Incidents of Assist to Citizens
3 Incidents of Damage to Government Property ($1,000.00)
3 Incidents of Damage to Private Property ($800.00)
1 Incident of Search & Rescue (overdue canoe party found)
7 Assorted Incidents

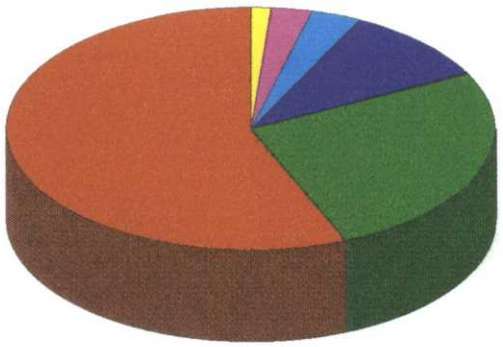
TOTAL incidents reported - 47.

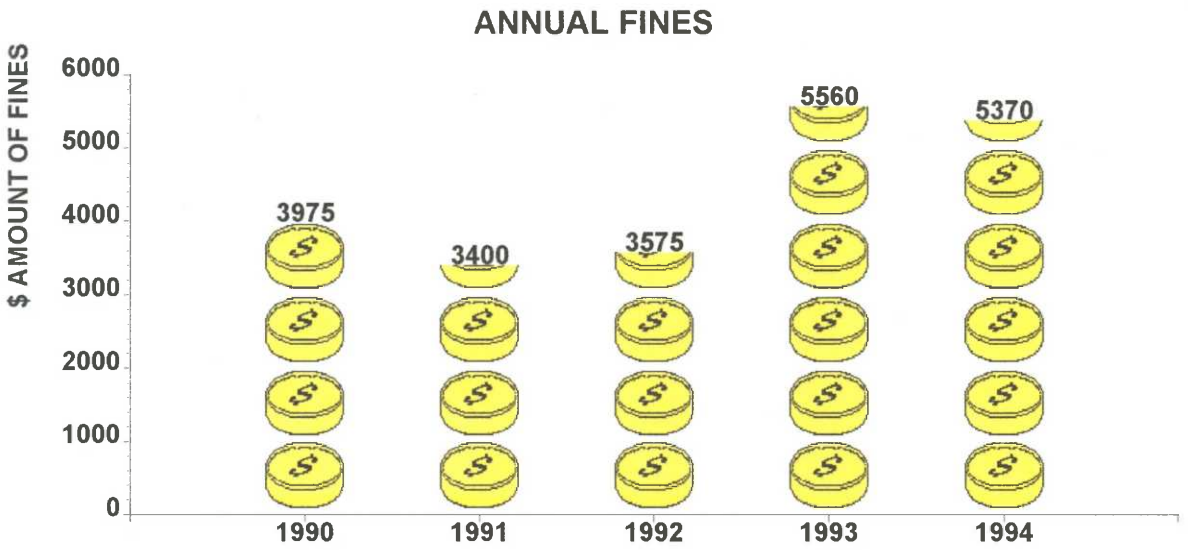


How many birds can you see at 39 mph?
(Liening, 5/94)

1994 VIOLATIONS







I. EQUIPMENT AND FACILITIES

1. New Construction

Major construction activities which took place on the Refuge this year included road construction on the southern 2.7 miles of the Refuge road with placement of geo-textile material prior to several layers of gravel and stone dust aggregate. This was completed at the end of July. The Refuge road south of Hellcat was closed for a two-week period to facilitate construction efforts. Busby Construction of Atkinson, NH completed the project.

Busby Construction rolling out the geo-textile material prior to putting on the gravel and stone aggregate. (Martinkovic, 7/94)

Two new parking areas were constructed by in-house staff; one located at the North Field cross dike and the other at the Knobbs road. The parking areas were composed of gravel and split-rail fencing. The Cross Dike required the construction of a retaining wall which was built from on-hand telephone poles. These areas will be used for wildlife observation and a parking area for the Pines Trail (to be constructed).

As noted under Youth Programs, a new section of boardwalk was completed on the Dune Loop trail. One thousand linear feet of old boardwalk in poor repair was dismantled, removed, and replaced with a raised section of boardwalk connecting the trail in a smaller loop.

Roughly 3,500 linear feet of roadside barricades (wood) were placed along the re-constructed 2.7 mile long gravel road. Penney Fence, of New London, NH was the sub-contractor for Busby Construction.

Work on the new handicapped-accessible (HA) restrooms at Lot #4 Hellcat Trail started in November. At year's end, the contractor (Mongiello Construction Co. Swampscott, MA) had poured the footers and foundation, installed the double vaults, and backfilled. Work will commence again in the spring.

2. Rehabilitation

Facilities and structures which received rehab work this year included the following: the Refuge residence received a new ceiling in the front hall; new floor in upstairs bathroom, along with new toilet, sink fixtures and heating vent covers; new vanity, sink and fixtures in the downstairs bathroom; and a new privacy door downstairs. Two new light fixtures were also installed replacing old unsafe fixtures.

The residence had 15 new energy-efficient windows installed just in time for the Nor' Easters. This work was done by Amesbury Glass, Amesbury, MA.

The residence also needed new well head piping. The old piping was rotted and was drawing air into the system which caused very irregular water pressure.

The Refuge dikes, which impound the North Pool and Bill Forward Pool, needed gravel added to several areas. Erosion had created the necessity to add the fill and grade the road bed on top of the dike.

3. Major Maintenance

A new water tank was installed at the VCS and water service was resumed in March.

Heavy equipment maintenance accounted for a great deal of time and expense this year. The Cat D-3 dozer required major overhaul work to the undercarriage, track assemblies, and an engine tuneup. The repairs totalled $ 4,800.00. The major repairs were done by a local Cat dealer, while the more routine fluid and filter changes to the station's fleet of equipment were done in-house.

The Refuge's 1992 Ford Bronco also underwent major repairs to the tune of $2,300.00 for a new transmission. Beach travel does not seem to agree with most equipment. The Refuge now only uses vehicles on the beach when absolutely necessary. More routine LE patrols and wildlife surveys are now conducted with ATV's.

The station's 4x4 full-size pick-up truck was refurbished with some body work and a paint job to improve its appearance and increase its longevity; a difficult task in this salt air environment.

Parker River's rotary mower sustained considerable damage while on loan to another station. Repairs were made (paid for by the responsible station) and the mower was returned to service. However, Parker River did not complete its mowing because of the down time associated with mower repairs. Total repair cost was $1,200.00.

Plumbing repairs at the VCS included new lines, a new vault pump and a pump out of the holding tank. (Burke, 5/94)

A new septic system was installed at the Headquarters building this year. (Drauszewski, 10/94)

Major plumbing repairs were necessary at the Visitor Contact Station (VCS) and at Headquarters this year. The VCS required the holding tank be pumped, a new vault pump be installed, and some piping be replaced to get the facility operational. In addition, the VCS had its water pump rebuilt. The Headquarters office complex received a new septic tank and lines this fall replacing the original system (installed in the 1950's) which had finally collapsed.

Electrical repairs completed this year included the VCS building where work was done on the main panel and overhead lines to bring the electrical system up to code. In addition, an outside GFIC outlet was installed.

An act of vandalism destroyed the front entrance gate to the Refuge. A vehicle pushed the gate open by breaking the metal pipe. A spare gate was located and installed. An electric locking mechanism, specifically made for electric slide gates, will be installed to prevent this from occurring in the future.

An exhaust fan was installed inside the main shop area. The fan was located inside a side wall to vent any fumes associated with welding or other maintenance activities. Also, a sheet metal hood was fabricated by a local shop and installed on the exterior frame to prevent backdrafts from entering.

4. Equipment Utilization and Replacement

Equipment additions and deletions consisted of low-level flight gear, i.e. helmets, Nomex coveralls and gloves were ordered through the Boise Interagency Fire Center for use on low-level aerial surveys.

A new 30' fiberglass flagpole was installed at the Headquarters complex; the old pole was rusted and too cumbersome to reinstall.

A new John Deere snow blower was purchased this year. It was decided to purchase the machine based on the record snowfalls during last two winters and to save time and backs on snow removal.

A pressure washer was purchased to keep our fleet of vehicles and equipment cleaner.

Two portable backpack sprayers and a mobile 15 gallon sprayer were ordered from Ben Meadows for herbicide spot spraying and pest plant control on the Refuge.

A new treadle-type system for the exit gate was ordered at year's end to replace the current installed system which is no longer serviceable. The new treadle system had to be custom ordered to fit the in ground vaults already in place.

Two new galvanized overhead garage doors replaced rotted wooden ones at Sub-headquarters. The work was completed by A&R Doors of Hampstead, NH.

A jeep Cherokee was transferred from Parker River to Craig Brook National Fish Hatchery this year. The vehicle had high mileage and was in need of some major repairs, which Craig Brook paid for.

The Motrim (aka Iron Dinosaur) is loaded on a trailer bound for mowing work at Great Meadows NWR - good luck folks! (Martinkovic, 11/94)

5. Communications Systems

Two new mobile UHF radios were received and installed in the station's two dedicated Law Enforcement vehicles. The local Police Department (Newbury, MA), which Parker River Officers use as dispatch, changed frequencies making it necessary to change radios.

6. Computer Systems

Upgrades to the Refuge's software included the following: Word Perfect 6.0, Arc View, File Make-a-Pro, R-base 4.5, Lotus 2.4. In addition, a new laser jet printer was purchased.

8. Other

The maintenance staff went through a winter to remember in 1994. A great deal of time was spent pushing snow. No sooner had one storm been cleared, when the next was already piling up. The 15 or so storms took their toll. Approximately 100 inches of snow fell on the Refuge, which set an all-time record. Snow tends to pile up into large drifts on various sections of the Refuge, which made removing it (from the road) a job for heavy equipment. Some drifts were 5 feet deep! When the roads were cleared, the piles on the roadsides were higher than the equipment.

It took all the station's heavy equipment to punch through to the southern end of the Refuge as a result of the "storms of 94". (Drauszewski 2/94)

As the snow piled higher and higher this year, employees spent more and more time removing it! (Drauszewski, 2/94)

Roadside brushing was completed with the combined use of the Mo-Trim and chain saw. Heavy equipment can now pass without hitting overhanging branches.

This year's property inventory required considerable time to complete. Files had to be cross-referenced to locate some discrepancies. The inventory was resolved with a great deal of work, however. Maintenance Worker Burke assumed responsibilities as the station's P.C.O. and will keep things updated.

Parker River NWR received the Cookie Cutter this summer to do some impoundment work. As expected, the machine required considerable maintenance in order to get it somewhat up-to-speed. A throttle cable was replaced, engine rpm's had to be adjusted in order for the blades to cut and cast material an adequate distance, and the blades continually needed to be tightened. It just didn't seem to perform effectively, although some minor progress was made in opening up some silted in channels.

J. OTHER ITEMS

3. Items of Interest

In support of the Ecosystem Management Approach, cooperative assistance was requested and accepted for Biologist Springfield, Maintenance Worker Burke, and Operations Specialist Nakai to assist Nashua National Fish Hatchery with their Atlantic salmon propagation field work on November 16. With guidance from Victor Segarich and his staff, they assisted with various aspects of the "in vitro" propagation. This entailed fertilizing the salmon eggs, rinsing eggs to remove "left-over" sperm and blood, continuously removing unfertilized eggs, and preparing the eggs for transportation to North Attleboro National Fish Hatchery where the eggs will be incubated. This was a valuable experience to gain some knowledge of the "fisheries" aspect of the "Fish and Wildlife Service".

Vic Segarich and Biologist Springfield in the salmon runways. After eggs were obtained from females, BIO Springfield jumped right in and "fertilized eggs"!
(Nakai, 11/94)

Maintenance Worker Burke meticulously removing unfertilized and damaged eggs with a baster.
(Nakai, 11/94)

4. Credits

Fillio	Sections D.1-4, 6; E.5; K; Thacher Island
Martinkovic	Introduction; Sections A; C.1; E.6
Drauszewski	Sections E.2, 3; F.5, 8-10, 12; I.1-6
Nakai	Sections D.5; F2; G.1-10, 15, 16; H.8b; J.3
Garcia	Section E.1
Parmenter	Sections B; E.8; J.4; Editing; Typing; Assembly

K. FEEDBACK

The newly established ecosystem approach to management of our trust resources appears to be a step in the right direction, to wit the pooling of Service staff and funds, as well as assistance from our many partners. Refuge staff have since assisted at a NFH during the salmon egg gathering process. Upon their return, the three Parker River Refuge staff that assisted indicated their willingness and eagerness to return and assist with further fisheries projects. Staff at the hatchery also indicated their strong desire to have some hands-on experience with waterfowl, i.e. banding. In addition, the camaraderie and cooperative attitudes of Ecosystem Team members that has developed over the past eight months during meetings, further proves the effectiveness of this management approach. The "bowling shirts" have indeed come off, and the "turf battles" of past years may just be history!

The Administrations' efforts to improve the efficiency of the Federal government (The National Performance Review) are welcome if in fact these efforts do result in better ways for field staff to complete their work. Some points to ponder:

One long-standing impediment is the limit on field station construction expenditures ($2,000), and "services" contracts ($2,500.) If the Davis-Bacon Wage Act could be updated to reflect modern actual costs and/or project leaders could obtain a higher warrant threshold, we could accomplish a great deal more without encumbering Regional CGS offices with minor contracts. Neither $2,000 nor $2,500 will "buy" much today.

Secondly, it appears that in today's commercial market many items can be purchased at "wholesale clubs" and other local sources at a much lower cost than through Federal, GSA, and mandatory contracts. We are located in such close proximity to open-market sources where we can purchase most of our needs at lower prices, and avoid any shipping costs by picking up items ourselves.

Finally, before any changes are initiated to improve the efficiency of government, it would behoove those proposing the changes to investigate the real life practicality of implementation with the employees in the field that will have to work and live with these changes. It would be better to "test" any changes before mandating implementation, lest new but different "impediments" are created.

Current processes/procedures to recruit, hire, fire, recognize, reward, purchase or contract are so cumbersome and slow that by the time a transaction is completed, the originator may have retired, transferred, or passed on to that "Great Refuge" in the sky! GS-12 or 13 project leaders, along with extremely knowledgeable and capable staff, can certainly be trained and trusted to conduct such transactions at the field level whenever possible, allowing for both money and FTE savings. We seem to be asked to operate and manage in the 1990's under 1930 and 1940's standards and requirements! Isn't it time to upgrade and appropriately empower field managers!!

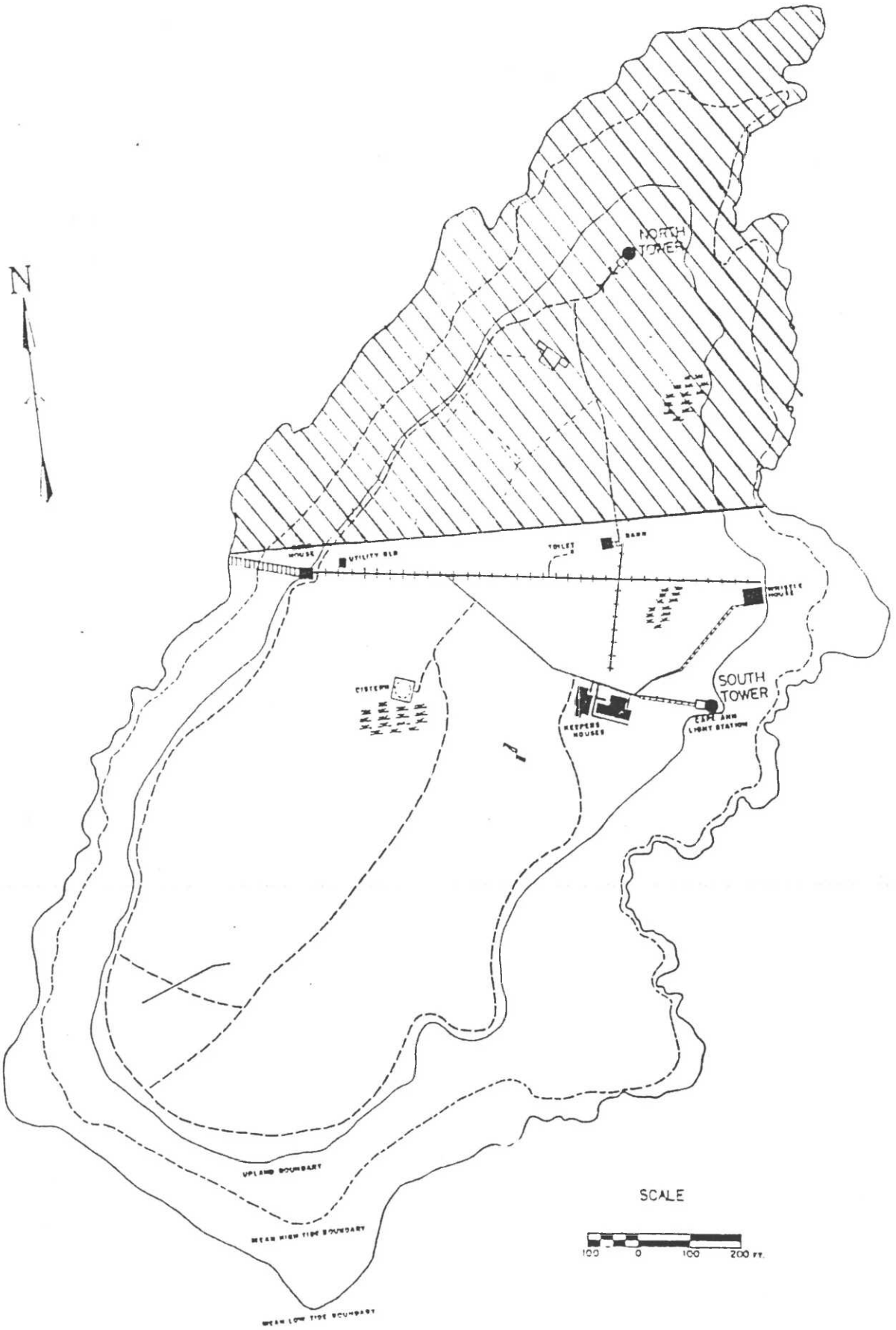
THACHER ISLAND

ANNUAL NARRATIVE REPORT
Calendar Year 1994

THATCHER'S ISLAND NATIONAL WILDLIFE REFUGE

Rockport, Massachusetts

THACHER ISLAND
ROCKPORT, MASSACHUSETTS



The North Tower at Thacher Island NWR
(Nakai, 5/94)

Thacher Island National Wildlife Refuge consists of 22 acres of rock edge, grass, and shrub. The Refuge is located on the northern end of Thacher Island and includes a 100' high light tower. The tower is one of two such structures on the island and both are listed in the National Register of Historic Buildings. Title to the area was transferred to the Fish and Wildlife Service from the U.S. Coast Guard in 1972.

Wildlife use of the limited island habitat includes both herring and black-backed gulls as nesting species, with off-shore use by cormorants and common eider.

Refuge Biologist Bob Springfield and Refuge Operations Specalist Glynnis Nakai made a trip to the island on May 19, 1994 to conduct an Atlantic Coastal/Colonial Waterbird survey in cooperation with the Massachusetts Division of Fisheries and Wildlife. All facilities were noted to be in good condition, and the grounds were well maintained by the Thacher Island Association (under the terms of the cooperative agreement). No other visits were made in 1994 as the Refuge is maintained at the custodial level.

CALENDAR OF WILDLIFE/WILDLAND EVENTS

JANUARY/FEBRUARY

Snowy, saw-whet and short-eared owls seen in area; rough-legged hawks and northern harriers soar over marshes or roost in trees at marsh edges; heavy storms or warm weather thawing may close lower refuge road for extended periods.

MARCH/APRIL

Waterfowl, raptors, shorebirds, wading birds and passerines begin to arrive on their northbound migration; piping plovers return to refuge beach; shadbush begins to flower in late April; purple martins arrive - setting up nests in martin houses.

MAY/JUNE

Geese hatch and feed in roadside fields; warbler migration peaks in May; beach plums blossom and false heather and honeysuckle begin to flower; fox kits emerge and play near dens.

JULY/AUGUST

Ducks hatch and broods feed in pools; snowy egrets present in large numbers; large flocks of shorebirds and swallows may also be seen; brown thrasher, catbirds, and tree swallows perch on fence posts along refuge road; mosquitoes and greenhead flies out in strength; purple loosestrife flowers.

SEPTEMBER/OCTOBER

Fall waterfowl migration begins; colorful glasswort shows in salt marshes; goldenrods and asters bloom; monarch butterflies may pass through.

NOVEMBER/DECEMBER

Wintering Canada geese present; American black duck numbers peak; snow buntings, horned larks, and lapland longspurs pass through in large flocks; harbor seals sun themselves on Emerson Rocks.

U.S. FISH AND WILDLIFE SERVICE

Parker River is one of almost 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, 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, contact:

Refuge Manager
Parker River National Wildlife Refuge
Northern Blvd., Plum Island
Newburyport, MA 01950-4315
(508) 465-5753

TDD relay service in Massachusetts only
1-800-439-2370

This leaflet is also available upon request in a large print version.

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

RL-52550 September 1993

Parker River

NATIONAL WILDLIFE REFUGE

Julie Zickefoose

Newburyport, Massachusetts

Welcome

Welcome to Parker River National Wildlife Refuge! We're glad you chose to visit, and we hope you enjoy the refuge.

The 4,662 acres of Parker River National Wildlife Refuge are home to over 800 species of plants and animals. Located on the southern two-thirds of Plum Island near Newburyport, Massachusetts, the refuge is one of the few natural barrier beach-dune-saltmarsh complexes left on the Northeast coast.

© June Henshaw

Unlike parks which are set aside for people, national wildlife refuges are specifically set aside for wildlife. People are invited to visit the refuge but not to the detriment of wildlife or the habitat. To ensure that positive balance, only certain activities are permitted. Please obey refuge regulations which have been established to protect you, the land, and the wildlife.

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Wildlife Management

The refuge was established in 1942 to protect and preserve migratory waterfowl, especially American black ducks and Canada geese. Over time, this objective has expanded to include the protection of all plants and wildlife native to the area with a special emphasis on endangered species.

© June Henshaw

Refuge staff and volunteers are continually working to improve the habitat for both resident and migratory wildlife. The many fields, freshwater pools, salt marshes and wooded areas provide a variety of habitat types necessary to plants and animals. Wildlife management at the refuge includes habitat management and wildlife population studies.

HABITAT MANAGEMENT – Like people, wildlife have basic needs for food and shelter. Due to an ever growing world, places that provide the necessary food and shelter (habitat) for wildlife are at a premium. At Parker River Refuge, like other national wildlife refuges, we strive to provide the best natural habitat possible for wildlife. Some habitat management activities conducted at the refuge include salt marsh restoration, controlled burning of vegetation, pest plant control, installation of artificial nesting structures, and water level manipulations.

WILDLIFE POPULATION SURVEYS – The more we know about wildlife, the better we can meet their needs and ensure their continued survival. To learn more, numerous surveys and research studies are conducted at the refuge. Some examples include population counts and surveys of birds and mammals, waterfowl banding, and research studies on migratory birds.

© June Henshaw

History

Plum Island was discovered by Champlain in 1601 and first mapped by Captain John Smith in 1616. Large mounds of shells called middens suggest use by coastal Indians. No permanent settlements were established – probably because of a lack of fresh water.

During the 1630's the area became known as Plum Island, due to the profusion of wild beach plums in late summer. Nearby residents were allowed to graze their livestock on the island until 1739, when the practice was declared illegal due to the depletion of the island's vegetation. Saltmarsh haying was an important industry until the mid-1800's. Remnants of circular "straddles" used to keep mown hay above tidal waters can still be seen in the marshes.

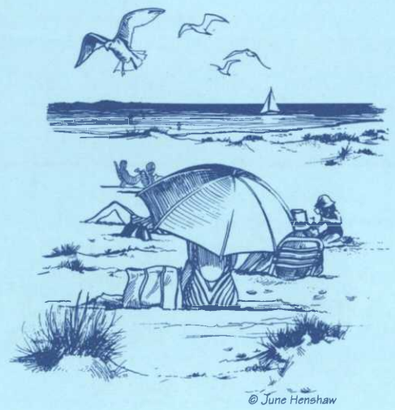
In 1806, a road and bridge were built connecting the island with the mainland. By 1890, a horsecar line reached Plum Island from downtown Newburyport. Much of the natural vegetation disappeared as more and more cottages were built.

In the early 1930's, the Massachusetts Audubon Society acquired 1,600 acres on Plum Island as a bird sanctuary. Parker River Refuge was established in 1942 when the U.S. Fish and Wildlife Service acquired this area and an additional 3,050 acres from private landowners with funds from Federal Duck Stamp sales. In 1985, an additional 12 acres were acquired on the mainland for a future headquarters and visitor center facility.

Visitor Information

The refuge is open daily from 1/2 hour before sunrise to 1/2 hour after sunset. An entrance fee is charged to refuge visitors. The fee options are:

- Daily refuge fee (car, bicycle or foot)
- Annual federal pass (Federal Duck Stamp and Golden Eagle)
- Lifetime federal pass (Golden Age & Golden Access)



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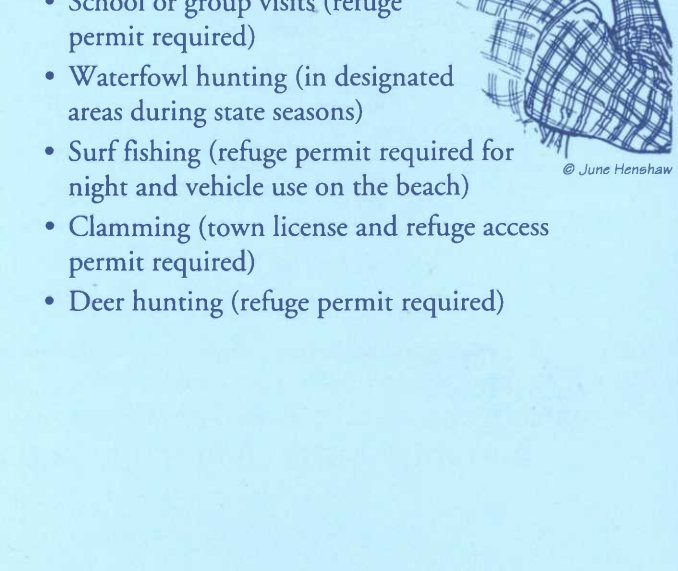
Sometimes during warm spring, summer and fall weekends, vehicle capacity at the refuge will be reached in early to mid-morning. When this occurs, no additional access is permitted. The refuge reopens after two hours to fill any vacated parking spaces. Visitors should plan to arrive early in an effort to avoid this inconvenience.

When the refuge beach is open, beach access via boardwalks is available at parking lots No. 1 – No. 7 (except lot No. 4). Lot No. 4 is reserved for visitors using the Hellcat Swamp Nature Trail. Visitors must stay on the boardwalks to avoid damaging fragile dune vegetation. The dunes are closed areas - no access into them is permitted. Boardwalks at parking lots No. 1 and No. 7 are handicapped accessible with observation decks overlooking the beach. Currently beach access is via stairs; however, ramps are scheduled for future installation.

The restrooms at the Visitor Contact Station in parking lot No. 1 are also handicapped accessible and open from April – October. Year round toilets are located at Hellcat Swamp Trail, parking lot No. 4.

WHAT YOU CAN DO FOR WILDLIFE...

- Follow refuge regulations. They protect both you and wildlife.
- Don't litter. It's unsightly and attracts predators.
- Serve as a refuge volunteer.
- If you see a problem, contact a refuge employee.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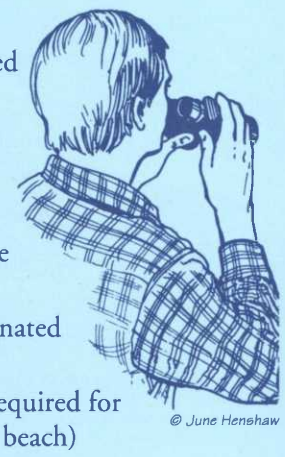
Public Use Activities

ENCOURAGED DURING OPEN PERIODS: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- Wildlife observation
- Photography (permit required for commercial operations)
- Walking on designated trails
- Bicycling along the refuge road
- School or group visits (refuge permit required)
- Waterfowl hunting (in designated areas during state seasons)
- Surf fishing (refuge permit required for night and vehicle use on the beach)
- Clamming (town license and refuge access permit required)
- Deer hunting (refuge permit required)


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Regulations

Regulations for National Wildlife Refuges are in the Code of Federal Regulations, Title 50. Refuge officers are on duty to assist visitors, ensure their safety, and enforce regulations.

Additional information is available at the Visitor Contact Station kiosk (lot No.1), the entrance gatehouse (when staffed) and at the refuge headquarters. Please contact the refuge headquarters (information on back cover) with any questions or concerns. Notice: The refuge beach may be closed to all public access starting April 1 to protect nesting piping plovers, a Federally listed threatened species. Sections of the refuge beach may reopen starting July 1. Contact refuge for specific details.


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PERMITTED THOUGH NOT ENCOURAGED:

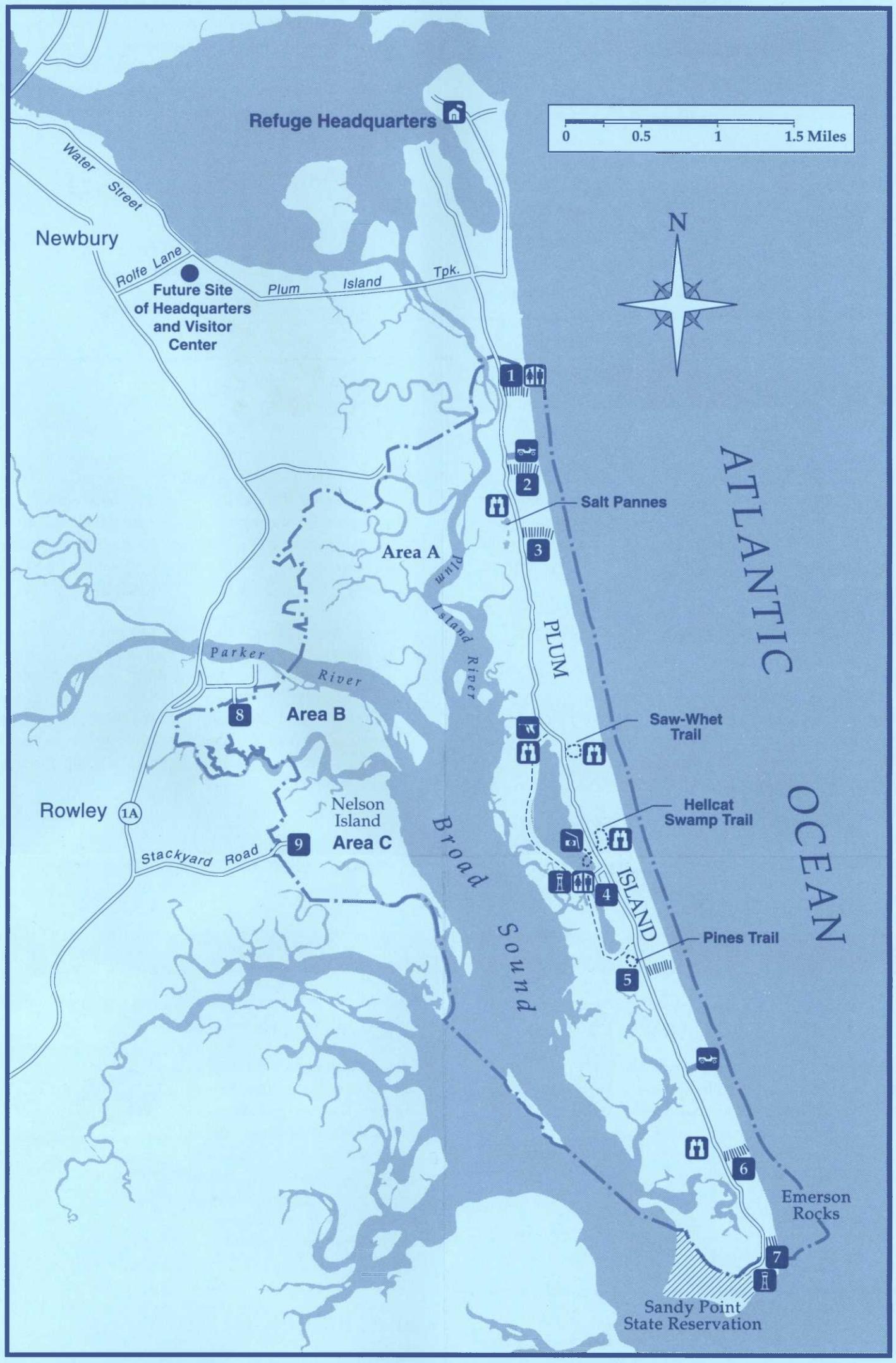
- Swimming – no lifeguards on duty. Undertows and currents are strong and can be dangerous.
- Pets on a leash no longer than 10 feet; from October 1 – March 31 on ocean beach only.
- Beach plum picking from Tuesday after Labor Day – October 31; one quart per person per day.
- Picnics with small contained cooking fires on refuge beach. Please remove all trash and coals.
- Beachcombing

PROHIBITED:

- Entry without paying entrance fee (unless fee exempt)
- Firearms, except during hunting seasons, then broken down, encased, and in trunk
- Alcoholic beverages (town regulations)
- Littering
- Launching/landing any watercraft or floats except boats used for waterfowl hunting during open seasons from designated site
- Parking outside designated lots
- Feeding wildlife
- Removal or destruction of any plants or animals
- Removing any beached buoys or lobster pots
- Entry into or disturbance of dunes or other closed areas
- Horses
- Use of lights (including headlights) to locate wildlife
- Violation of town, state, federal regulations
- Pets on refuge - except as noted above
- Rollerblading and skateboarding

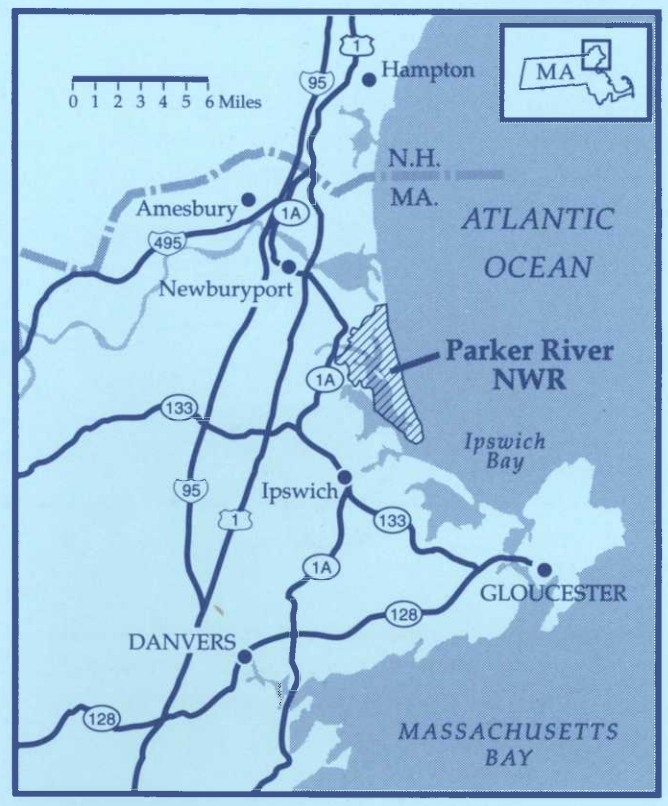
PARKER RIVER
NATIONAL WILDLIFE REFUGE
Newburyport, Massachusetts

Directions: The Refuge is located 32 miles northeast of Boston on the southern 2/3 of Plum Island and can be reached from the Route 113 exit of I-95. Follow Route 113 (1-A) for 3.8 miles to the directional signs for the Refuge and Plum Island. Refuge Headquarters is located at the northern tip of Plum Island.



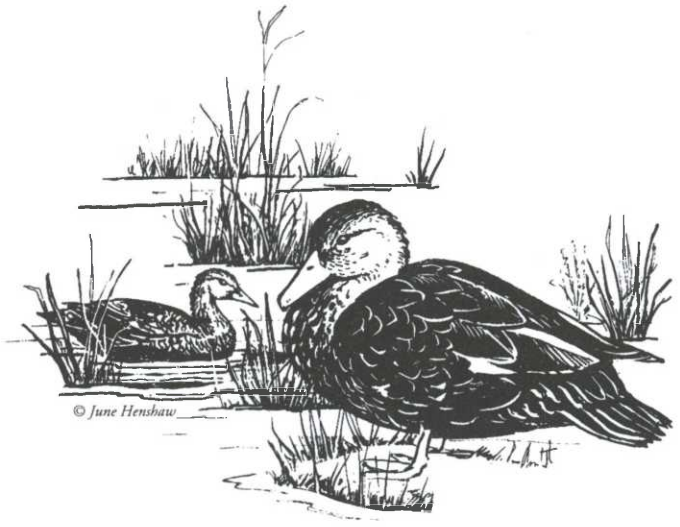
LEGEND

- Refuge Headquarters
- Refuge Boundary
- Refuge Subheadquarters
- 2 Parking Lot
- Roads
- Boardwalk to Beach
- ORV Access Trail (4WD) (Permit Required)
- Walking Trail
- Wildlife Observation Area
- Observation Tower
- Photography Blind
- Dike
- Public Restroom



Birds

PARKER RIVER
National Wildlife Refuge

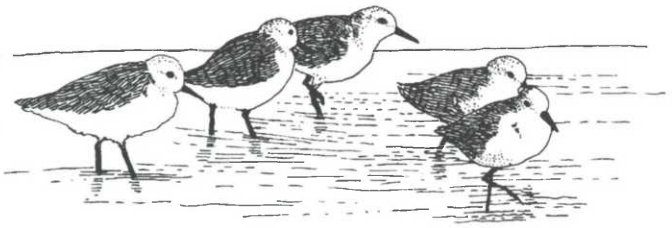


U.S. FISH & WILDLIFE SERVICE
DEPARTMENT OF THE INTERIOR

Newburyport, Massachusetts

Welcome to Parker River National Wildlife Refuge. The refuge contains 4,662 acres of sandy beach and dunes, bogs, freshwater impoundments and tidal marshes.

The following list, which conforms to the Sixth American Ornithological Union's Checklist, contains 302 species that have been recorded on or seen from the refuge during the past 20 years. A separate list is included of 39 species that have been seen several times during this period. This list was prepared in cooperation with the Massachusetts Audubon Society, the Brookline Bird Club, the Peabody Museum, and numerous knowledgeable local birders.



Bird activity on the refuge is highlighted by shorebird migrations and flocks of swallows in late summer and large flocks of waterfowl in the fall and early spring.

Most birds are migratory. The peak migration periods at Parker River are usually March 1–June 7, and August 1–October 31. The birds' seasonal occurrence is coded as follows:

SEASON

s	Spring	March 21 – June 20
S	Summer	June 21 – September 20
F	Fall	September 21 – December 20
W	Winter	December 20 – March 20

RELATIVE ABUNDANCE

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

• Birds known to nest on or near the refuge

Italics indicate federally listed threatened/endangered species

		s	S	F	W
LOONS – GREBES					
___	Red-throated Loon	u		c	u
___	Common Loon	c	o	c	c
___	Pied-billed Grebe	u	u	u	
___	Horned Grebe	c		c	c
___	Red-necked Grebe	u		o	u
SHEARWATERS – STORM-PETRELS					
___	Northern Fulmar	o			o
___	Greater Shearwater	o	o	o	
___	Sooty Shearwater	o	o	o	
___	Manx Shearwater	o	o	o	
___	Wilson's Storm-Petrel	o	o	o	
___	Leach's Storm-Petrel			r	
GANNETS – CORMORANTS					
___	Northern Gannet	u	r	u	u
___	Great Cormorant	o	r	o	u
___	Double-crested Cormorant	a	a	c	o
BITTERNS – HERONS – IBISES					
___	American Bittern	u	u	u	o
___	• Least Bittern	u	u	o	
___	Great Blue Heron	c	u	c	o
___	Great Egret	u	u	u	
___	Snowy Egret	c	c	c	
___	Little Blue Heron	o	u	u	
___	Tricolored Heron	o	o	o	
___	Cattle Egret	o	o	o	
___	• Green Heron	c	c	u	
___	• Black-crowned Night-Heron	c	c	u	o
___	Yellow-crowned Night-Heron	o	u	o	
___	Glossy Ibis	u	u	o	
SWANS – GEESE – DUCKS					
___	Tundra Swan			r	
___	Mute Swan	u	u	u	o
___	Greater White-fronted Goose			r	
___	Snow Goose	u		u	r
___	Brant	u		u	o
___	• Canada Goose	a	a	a	c
___	• Wood Duck	u	u	o	
___	• Green-winged Teal	c	u	c	u
___	• American Black Duck	a	c	a	c
___	• Mallard	a	c	a	c
___	• Northern Pintail	u	u	c	u
___	• Blue-winged Teal	c	c	u	
___	• Northern Shoveler	u	u	u	r
___	• Gadwall	a	c	a	o
___	Eurasian Wigeon	r		r	
___	American Wigeon	u	o	c	o
___	Canvasback	r		r	r
___	Redhead	r		r	r
___	Ring-necked Duck	o		o	r
___	Greater Scaup	u		u	u
___	Lesser Scaup	r		r	

		s	S	F	W
___	Common Eider	c	o	u	c
___	King Eider	r	r	r	r
___	Harlequin Duck	r			r
___	Oldsquaw	c		u	c
___	Black Scoter	c	r	c	u
___	Surf Scoter	u	o	c	u
___	White-winged Scoter	c	o	c	c
___	Common Goldeneye	u		u	c
___	Barrow's Goldeneye	o			o
___	Bufflehead	u		c	c
___	Hooded Merganser	u	r	u	r
___	Common Merganser	r		r	r
___	Red-breasted Merganser	c	u	c	c
___	• Ruddy Duck	r	r	u	r

VULTURES – HAWKS – FALCONS

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

PHEASANT – GROUSE

___	• Ring-necked Pheasant	u	u	u	u
___	Ruffed Grouse	r	r	r	r

RAILS – CRANES

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

PLOVERS – SANDPIPERS

___	Black-bellied Plover	c	a	c	o
___	American Golden-Plover	r	o	u	
___	Semipalmated Plover	c	c	u	
___	• *Piping Plover*	u	u	o	
___	• Killdeer	c	c	u	
___	American Oystercatcher	r			
___	American Avocet		r	r	
___	Greater Yellowlegs	c	c	c	r
___	Lesser Yellowlegs	c	c	c	r

		s	S	F	W
___	Solitary Sandpiper	o	o	o	
___	• Willet	c	c	u	
___	• Spotted Sandpiper	u	u	u	
___	Upland Sandpiper	o	o	o	
___	Whimbrel	o	o	o	
___	Hudsonian Godwit		u	u	
___	Marbled Godwit		o	o	
___	Ruddy Turnstone	o	u	o	r
___	Red Knot	o	u	u	
___	Sanderling	c	c	c	u
___	Semipalmated Sandpiper	a	a	a	
___	Western Sandpiper		o	o	
___	Least Sandpiper	c	c	u	
___	White-rumped Sandpiper	u	u	u	
___	Baird's Sandpiper		o	o	
___	Pectoral Sandpiper	u	u	u	
___	Purple Sandpiper	o		o	o
___	Dunlin	c	u	a	o
___	Stilt Sandpiper	r	c	u	
___	Buff-breasted Sandpiper		o	o	
___	Ruff	o	o	o	
___	Short-billed Dowitcher	c	c	o	
___	Long-billed Dowitcher		o	u	
___	Common Snipe	o	o	u	
___	American Woodcock	u	u	u	
___	• Wilson's Phalarope	u	u	u	
___	Red-necked Phalarope	o		o	
___	Red Phalarope	r		r	

JAEGERS – GULLS – TERNS – MURRES

___	Pomarine Jaeger		r	r	
___	Parasitic Jaeger		o	o	
___	Laughing Gull	o	o	o	
___	Little Gull	o	o	o	o
___	Common Black-headed Gull	o	o	o	o
___	Bonaparte's Gull	o	o	o	o
___	Ring-billed Gull	c	u	u	c
___	• Herring Gull	a	a	a	a
___	Iceland Gull	o			u
___	Glaucous Gull				o
___	Great Black-backed Gull	a	a	a	a
___	Black-legged Kittiwake	o		o	o
___	Caspian Tern	o	o	o	
___	Royal Tern	o	o	o	
___	*Roseate Tern*	o	o		
___	• Common Tern	c	c	u	
___	Arctic Tern	r	r		
___	Forster's Tern		o	o	
___	• Least Tern	c	c	u	
___	Black Tern	o	o	o	
___	Black Skimmer	r	o	r	
___	Dovekie			o	o
___	Common Murre	r			r
___	Thick-billed Murre	o		o	o
___	Razorbill	o		o	o

		s	S	F	W

DOVES – CUCKOOS – OWLS

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

WOODPECKERS – FLYCATCHERS

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

LARKS – SWALLOWS – JAYS – CROWS

___	• Horned Lark	u	u	u	u
___	• Purple Martin	c	c	u	
___	• Tree Swallow	c	a	a	
___	• Northern Rough-winged Swallow	o	o	o	
___	• Bank Swallow	c	c	u	
___	• Cliff Swallow	u	u	u	
___	• Barn Swallow	c	c	c	
___	• Blue Jay	c	u	c	u
___	• American Crow	c	c	c	c

TITMICE – NUTHATCHES – WRENS

___	• Black-capped Chickadee	u	c	c	u
___	Boreal Chickadee			r	r
___	Tufted Titmouse	r	r	r	r
___	Red-breasted Nuthatch	u	u	u	u
___	White-breasted Nuthatch	u	u	u	o
___	Brown Creeper	o	o	u	o
___	• House Wren	o	o	u	
___	Winter Wren	u	o	u	
___	• Marsh Wren	c	c	u	

		s	S	F	W
KINGLETS – THRUSHES – THRASHERS					
___	Golden-crowned Kinglet	u	o	c	
___	Ruby-crowned Kinglet	c	o	c	
___	Blue-gray Gnatcatcher	u	o	o	
___	Eastern Bluebird	r		r	
___	• Veery	u	u	u	
___	Gray-cheeked Thrush	o	o	o	
___	Swainson's Thrush	u	r	u	
___	Hermit Thrush	u		u	o
___	Wood Thrush	u	o	u	
___	• American Robin	c	u	c	o
___	• Gray Catbird	a	a	a	
___	• Northern Mockingbird	u	u	u	u
___	• Brown Thrasher	c	c	c	
WAXWINGS – SHRIKES – STARLINGS					
___	American Pipit	u		u	
___	• Cedar Waxwing	u	u	u	
___	Northern Shrike	o		o	o
___	Loggerhead Shrike	r	r	r	
___	• European Starling	a	a	a	a
VIREOS – WOOD WARBLERS					
___	White-eyed Vireo	o	o	o	
___	Solitary Vireo	u		u	
___	Yellow-throated Vireo	o		o	
___	Warbling Vireo	r			
___	Philadelphia Vireo	o	o	u	
___	• Red-eyed Vireo	c	u	c	
___	Blue-winged Warbler	o		o	
___	Golden-winged Warbler	r		r	
___	Tennessee Warbler	u	o	u	
___	Orange-crowned Warbler	r		o	
___	Nashville Warbler	u	o	u	
___	Northern Parula	u	o	u	
___	• Yellow Warbler	a	a	u	
___	Chestnut-sided Warbler	u	o	o	
___	Magnolia Warbler	u	o	u	
___	Cape May Warbler	o	u	u	
___	Black-throated Blue Warbler	u	o	u	
___	Yellow-rumped Warbler	a	o	a	u
___	Black-throated Green Warbler	u	o	u	
___	Blackburnian Warbler	u	o	u	
___	Yellow-throated Warbler	r	r	r	
___	Pine Warbler	o	o	o	o
___	Prairie Warbler	u	o	u	
___	Palm Warbler	u		c	o
___	Bay-breasted Warbler	u	o	u	
___	Blackpoll Warbler	c	o	a	
___	Cerulean Warbler	r			
___	Black-and-white Warbler	c	o	c	
___	• American Redstart	c	u	c	
___	Prothonotary Warbler	r			
___	Worm-eating Warbler	o		o	
___	Ovenbird	u	o	u	
___	Northern Waterthrush	u	o	u	
___	Kentucky Warbler	r			
___	Connecticut Warbler		o	o	
___	Mourning Warbler	u		u	
___	• Common Yellowthroat	c	c	c	
___	Hooded Warbler	o	o	o	
___	Wilson's Warbler	u	o	u	
___	Canada Warbler	u	o	u	
___	Yellow-breasted Chat	o	o	o	
TANAGERS – SPARROWS					
___	Summer Tanager	r			
___	Scarlet Tanager	u	o	u	
___	• Northern Cardinal	u	u	u	u
___	Rose-breasted Grosbeak	u	o	u	
___	Blue Grosbeak	o	o	o	
___	Indigo Bunting	o	o	o	
___	Dickcissel	o		o	
___	• Rufous-sided Towhee	c	c	c	o
___	American Tree Sparrow	u		u	c
___	Chipping Sparrow	u	u	u	
___	Clay-colored Sparrow		o	o	
___	Field Sparrow	o	o	o	
___	• Vesper Sparrow	o	o	o	
___	Lark Sparrow		o	o	
___	Lark Bunting			r	
___	• Savannah Sparrow	c	c	c	o
___	• Sharp-tailed Sparrow	c	c	c	
___	• Seaside Sparrow	o	o	o	o
___	Fox Sparrow	u		u	o
___	• Song Sparrow	a	a	a	u
___	Lincoln's Sparrow	o	o	o	
___	• Swamp Sparrow	c	c	u	o
___	White-throated Sparrow	a	o	a	u
___	White-crowned Sparrow	u	o	u	
___	Dark-eyed Junco	c	o	c	c
___	Lapland Longspur	u	o	c	u
___	Snow Bunting	u	o	c	u
BLACKBIRDS – FINCHES					
___	• Bobolink	c	c	u	
___	• Red-winged Blackbird	a	a	a	o
___	• Eastern Meadowlark	u	u	u	o
___	Yellow-headed Blackbird	r	r	r	
___	Rusty Blackbird	o		o	
___	• Common Grackle	c	c	c	o
___	• Brown-headed Cowbird	u	u	c	
___	Orchard Oriole	r			
___	Northern Oriole	u	o	u	
___	Pine Grosbeak			o	o
___	• Purple Finch	c	c	u	u
___	• House Finch	c	c	c	u
___	Red Crossbill	o	o	o	u
___	White-winged Crossbill	o	o	o	u
___	Common Redpoll	o			u
___	Pine Siskin	o		u	u
___	• American Goldfinch	c	c	c	u
___	Evening Grosbeak	r		r	r
___	• House Sparrow	u	c	u	u

ACCIDENTALS

These additional 39 species have been recorded no more than several times in the last 20 years:

Pacific Loon
Eared Grebe
Western Grebe
Cory's Shearwater
American White Pelican
Little Egret
White Ibis
White-faced Ibis
Fulvous Whistling Duck
Garganey
Sandhill Crane
Wilson's Plover
Black-necked Stilt
Spotted Redshank
Terek Sandpiper
Bar-tailed Godwit
Little Stint
Long-tailed Jaeger
Franklin's Gull
Thayer's Gull
Ross' Gull
Sabine's Gull
Ivory Gull
Gull-billed Tern
Sooty Tern
Black Guillemot
Atlantic Puffin
Barn Owl
Chuck-will's widow
Black-backed Woodpecker
Say's Phoebe
Scissor-tailed Flycatcher
Common Raven
Carolina Wren
Sedge Wren
Bohemian Waxwing
Grasshopper Sparrow
Henslow's Sparrow
LeConte's Sparrow

NOTES

Date _____ Time _____

Observers _____

Weather _____

Tides _____

U.S. Fish and Wildlife Service

Parker River 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, 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, contact:

Refuge Manager
Parker River National Wildlife Refuge
Northern Boulevard, Plum Island
Newburyport, MA 01950
Telephone: (508) 465-5753

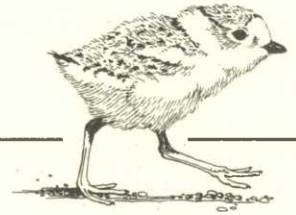
Hard of hearing or deaf visitors may call the Massachusetts Relay Center at 1-800-439-2370 TDD/voice

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

RL-53550 January 1995

Things You Can Do To Help Protect the Piping Plover

- Respect all areas fenced or posted for protection of wildlife.
- Do not approach or linger near piping plovers or their nests.
- If pets are permitted on beaches used by plovers, keep your pets leashed.
- Don't leave or bury trash or food scraps on beaches. Garbage attracts predators which may prey upon piping plover eggs or chicks.



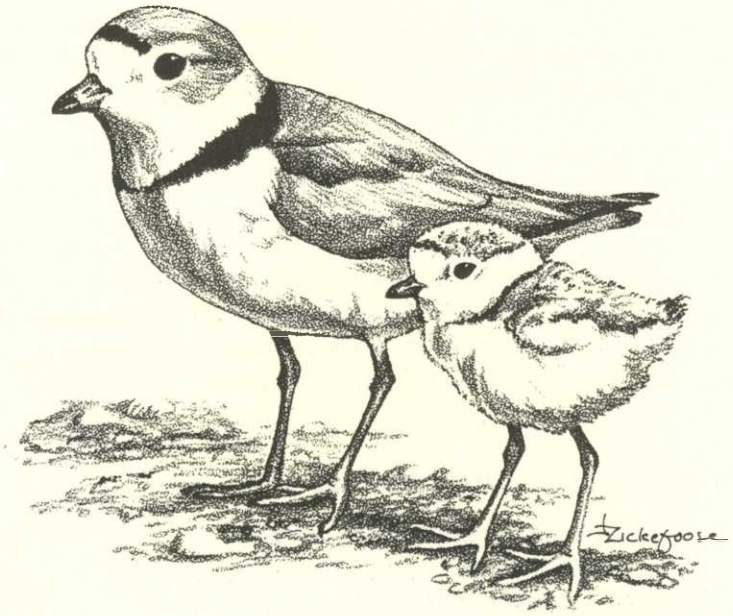
The piping plover is protected under the Endangered Species Act.

For further information, contact the Office of Endangered Species, U.S. Fish and Wildlife Service, One Gateway Center, Newton Corner, Massachusetts 02158, or contact your State Natural Resource Agency.

Illustrations by Julie Zickefoose

Prepared by the U.S. Fish and Wildlife Service, Region 5
February 1991

You Can Help Protect



The Piping Plover

Description

The piping plover is a small, stocky, sandy-colored bird resembling a sandpiper. The adult has yellow-orange legs, a black band across the forehead from eye to eye, and a black ring around the base of its neck. Like other plovers, it runs in short starts and stops. When still, the piping plover blends into the pale background of open, sandy habitat on outer beaches where it feeds and nests. The bird's name derives from its call notes, plaintive bell-like whistles which are often heard before the birds are seen.

Distribution and Abundance Along the Atlantic Coast

The piping plover breeds on coastal beaches from Newfoundland and southeastern Quebec to North Carolina. These birds winter primarily on the Atlantic Coast from North Carolina to Florida, although some migrate to the Bahamas and West Indies.

Piping plovers were common along the Atlantic Coast during much of the 19th century, but nearly disappeared due to excessive hunting for the millinery trade. Following passage of the Migratory Bird Treaty Act in 1918, numbers recovered to a 20th century peak which occurred during the 1940's. The current population decline is attributed to increased development and recreational use of beaches since the end of World War II. The most recent surveys place the Atlantic population at less than a thousand pairs.

Breeding and Feeding Habits

Piping plovers return to their breeding grounds in late March or early April. Following establishment of nesting territories and courtship rituals, the pair forms a depression in the sand somewhere on the high beach close to the dunes. The nest is sometimes lined with small stones or fragments of shell. The four eggs hatch in about 25 days, and the downy young are soon able to follow their parents in foraging for the marine worms, crustaceans, and insects which they pluck from the sand. Both the eggs and young are so well camouflaged that they are apt to go undetected unless stepped on. When predators or intruders come close, the young squat motionless on the sand while the parents attempt to attract the attention of the intruders to themselves, often by feigning a broken wing. Surviving young fledge and are flying in about 30 days. However, stormtides, predators, or intruding humans sometimes disrupt nests before the eggs hatch. When this happens, the plovers often renest in the vicinity and young hatched from these late nesting efforts may not be flying until late August. Plovers often gather in groups on undisturbed beaches prior to their southward migration. By mid-September, both adult and young plovers will have departed for their wintering areas.

Threats

Several factors are contributing to the decline of the piping plover along the Atlantic Coast.

- Commercial, residential, and recreational development have decreased the amount of coastal habitat available for piping plovers to nest and feed.
- Human disturbance often curtails breeding success. Foot and vehicular traffic may crush nests or young. Excessive disturbance may cause the parents to desert the nest, exposing eggs or chicks to the summer sun and predators. Interruption of feeding may stress juvenile birds during critical periods in their development.
- Pets, especially dogs, may harass the birds.
- Developments near beaches provide food that attracts increased numbers of predators such as raccoons, skunks, and foxes. Domestic and feral cats are also very efficient predators of plover eggs and chicks.
- Stormtides may inundate nests.

Protection Under the Endangered Species Act

The piping plover became a protected species under the Endangered Species Act on January 10, 1986. Along the Atlantic Coast it is designated as threatened, which means that the population would continue to decline if not protected. The Endangered Species Act provides penalties for taking, harassing or harming the piping plover and affords some protection to its habitat.

Continuing Threats

The least tern faces many obstacles on its nesting territory:

- storm tides - extreme high tides can overwash nests and eggs.
- oil spills and other pollutants - may contaminate water and tern feeding areas
- predation - brown rats, raccoons, skunks, foxes, great black-backed and herring gulls, great horned owls, black-crowned night herons, northern harriers, and American kestrels all eat tern eggs and chicks.
- habitat loss - terns compete for space on the beach with humans and coastal developments; undisturbed sandy beaches are becoming scarce.
- human disturbance - foot and vehicle traffic may crush nests and chicks; kite-flying near colonies flushes adults, which may interpret the kites as predators;
- pets - loose dogs may kill chicks or flush adults off nests, exposing eggs and chicks to predation and the elements, house cats hunt in tern colonies;

Protection

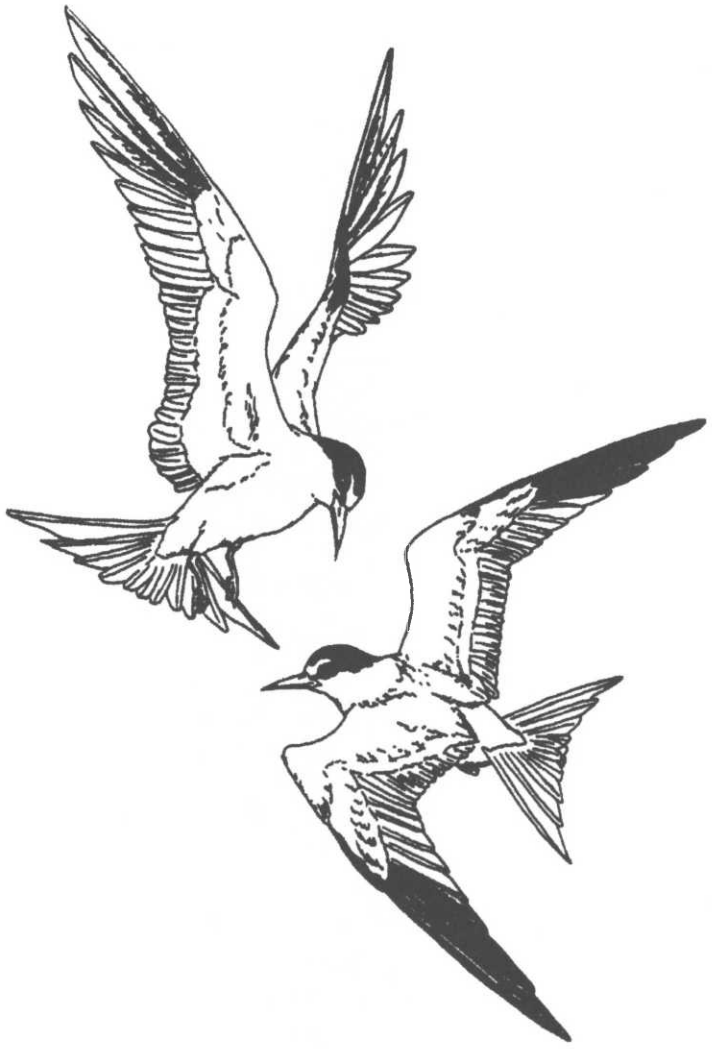
Each nesting season, posts, signs, and snow fencing are erected on the beach around least tern colonies. Along with beach closures, this helps keep human disturbance to a minimum.

Things You Can Do to Help Protect the Least Tern

- Respect all areas fenced or posted to protect wildlife.
- Do not approach or linger near least tern colonies.
- Keep pets leashed, if pets are permitted on beaches.
- Don't leave food or scraps on beaches. Garbage attracts predators.

The least tern is protected under the Migratory Bird Treaty Act and by some State laws.

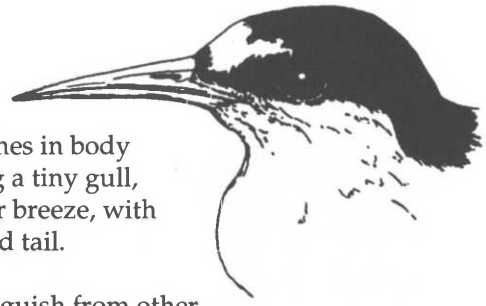
For further information, contact the U.S. Fish and Wildlife Service,
One Gateway Center, Newton Corner, MA 02158, or your State natural resource agency.



Sharing The Beach With

Least Terns

Description



The least tern, as its name suggests, is the smallest tern in North America, a mere nine inches in body length. Superficially resembling a tiny gull, it flies buoyantly on the summer breeze, with long, pointed wings and a forked tail.

The least tern is easy to distinguish from other terns. Its white forehead, which most other terns lack, contrasts sharply against a jet-black cap. The yellow bill and legs of least terns also set them apart from their larger cousins. The back and wings are a pearly gray, and the breast and underparts snowy white. Their high-pitched call, "chit-chit! chit-chit!" and a series of "chirree-chirree-chirree" notes are familiar summer sounds along many Atlantic Coast beaches.

Distribution and Abundance along the Atlantic Coast

The least tern nests from Maine to Virginia. After spending winter along the coast of Central and South America and the Caribbean, the terns return to our shores in May. A U.S. Fish and Wildlife survey estimated a breeding population of 9,380 pairs of least terns along the Coast from Maine to Virginia in the mid-1980s. Perhaps another 15,000 pairs nested along the South Atlantic and Gulf Coasts.

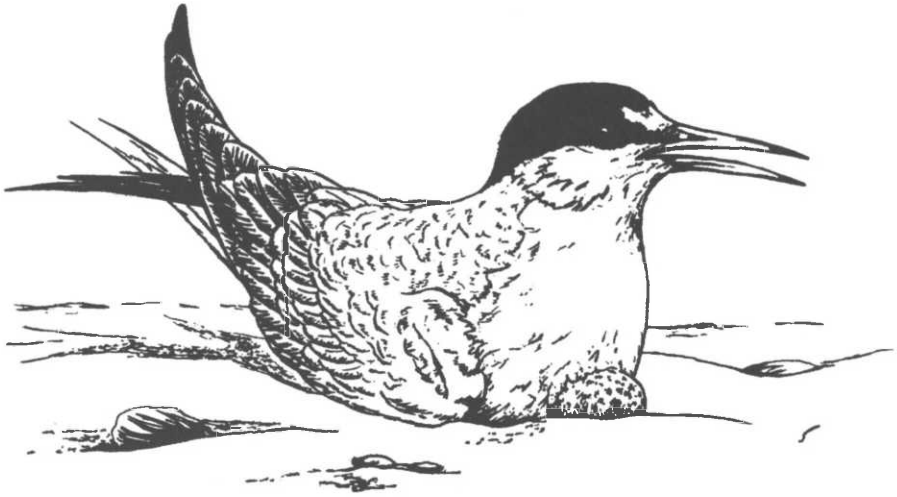
Threats

During the final decades of the 19th century, many tern species were hunted for their beautiful plumage and tail streamers, which were fashioned into ladies' hats. Tern numbers plummeted. Passage of the Migratory Bird Treaty Act in 1918 put an end to this senseless slaughter, allowing the terns and other bird species to recover.

In their rebound, least terns have faced new threats. Human disturbance, loss of coastal habitat, and an increase in mammalian predators threaten their survival at many locations. While the least tern population along the Atlantic Coast is stable and has never been added to the Federal Endangered Species List, it is a species of concern in several States. Declining interior and West Coast populations were classified as endangered as early as 1970.

Nesting and Chick Rearing

Least terns nest above the high tide line on sandy or stony beaches. They often share the beach with nesting piping plovers. Upon arrival, least terns go through an elaborate courtship display. The male presents his mate with a fish, held tightly in his bill, and swings his head from side to side. Once mated, the pair hollows out a shallow scrape in the sand, in which 2-3 eggs are laid and incubated for about 3 weeks. Both parents share the chores of incubation, brooding, and feeding chicks.



When intruders or predators approach the nesting territory, the chicks crouch motionless, while all adults take to the air. The terns attempt to drive the intruder away by divebombing and often defecating on them. But, being on the ground, nests and chicks are extremely vulnerable. The flightless chicks have no way to escape predators.

After about 3 weeks, the chicks fledge, and flock with their parents at the water's edge. Like the adults, they hover over the riptides and currents but still obtain most food from parents. They dive most commonly for sand launch, a small silvery fish that travels in schools. In September least terns gather in great flocks with other tern species, prior to their lengthy migration south.

SHELLFISHING PERMIT INFORMATION

PARKER RIVER NATIONAL WILDLIFE REFUGE
Northern Boulevard, Plum Island
Newburyport, Massachusetts 01950
(508) 465-5753

PERMITS:

To access clam flats from the Refuge, you must possess a valid Refuge shellfishing permit on your person. To qualify for a permit you must possess a valid commercial or recreational clamming license from the Towns of Newbury, Rowley, or Ipswich. Refuge permits must be applied for in-person and are available year-round from Refuge Headquarters during normal business hours(Monday - Friday, 8am - 430pm, Federal holidays excluded) and from the Refuge entrance kiosk, located on Sunset Boulevard, Plum Island, when staffed. ***Permits*** *are valid through December 31 of the year of issuance and* ***are at all times subject to discretionary revocation by the Refuge Manager****.*

USER FEES:

There is no charge for a permit. Recreational shellfishing permit holders, however, are subject to a daily Refuge entrance fee of $5/vehicle, $2/walk-on or bicycle, at the Plum Island section of the Refuge. Annual(Federal Duck Stamp, Golden Eagle Passport) and lifetime(Golden Age/Access Passports) passes are available.

ACCESS:

Use is limited to the normal hours of Refuge operation, 1/2 hour before sunrise to 1/2 hour after sunset. The ***entrance gate*** *at the Plum Island portion of the Refuge* ***is closed at sunset****. During normal hours of operation, the Plum Island portion of the Refuge is closed whenever vehicle parking capacity is reached. At these times both recreational and commercial permit holders are allowed access for clamming purposes only, 2 hours before - 2 hours after low tides. During Refuge deer and waterfowl hunting seasons, only commercial shellfishing permit holders are allowed access to Plum Island flats and Nelson Island flats, respectively. It is advisable to wear hunter orange at these times.* ***Access to all flats is from designated parking areas only****. At times, road closures due to snow, flooding, etc. may limit access. Also, flats are sometimes closed by Town declaration for public health and other concerns. At these times, all access is prohibited.*

PARKING:

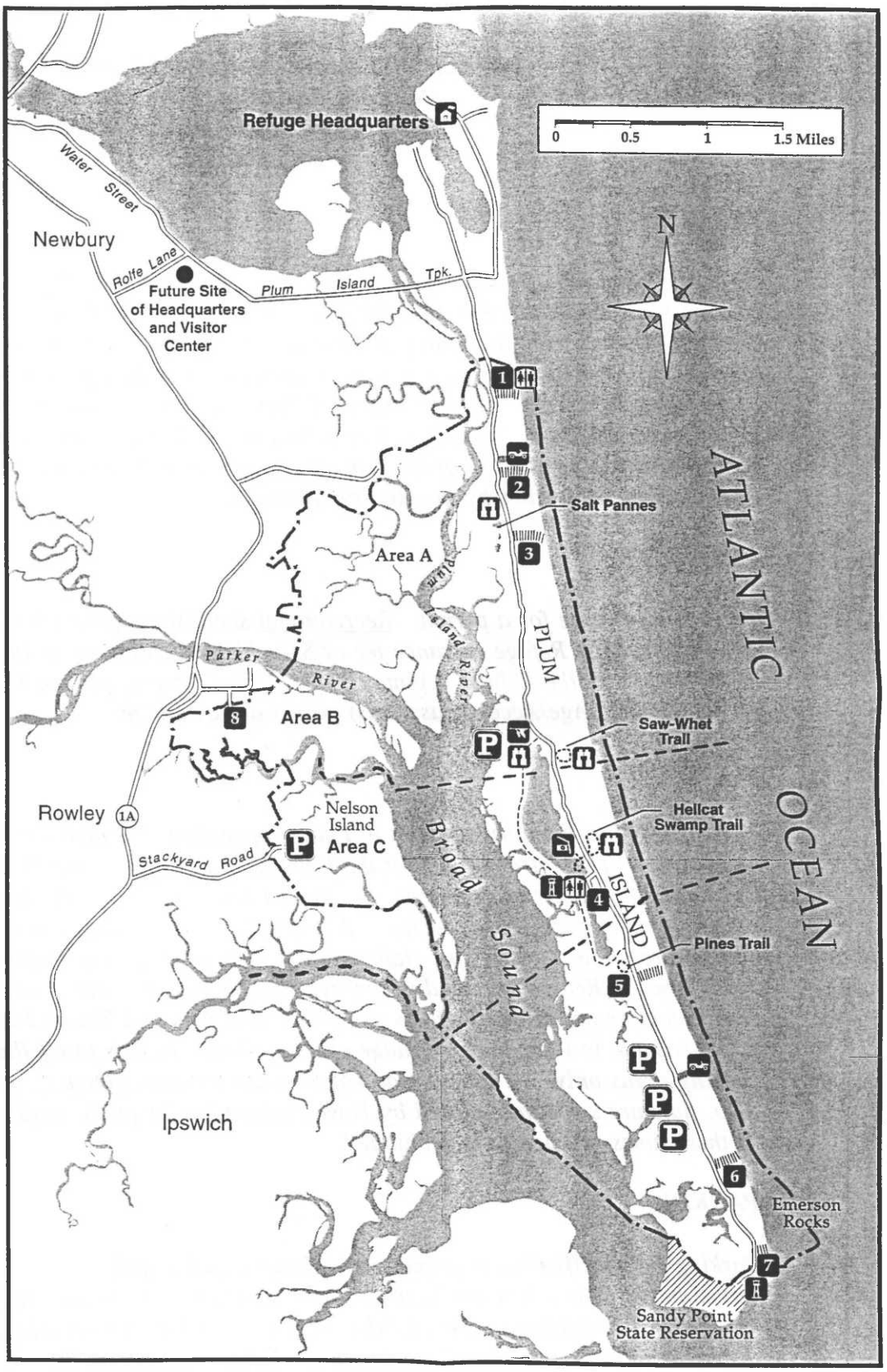
Parking for shellfishing is permitted in designated lots only *and is on a first come-first served basis. These lots are located near each clamming area(see map on reverse). Commercial shellfishing permit holders may also park at Nelson Island. All vehicles must display a valid permit decal(issued with the Refuge permit) on the driver's side, lower corner of the windshield.*

LEGEND

- Refuge Headquarters
- Refuge Boundary
- Refuge Subheadquarters
- Parking Lot
- Roads
- Boardwalk to Beach
- ORV Access Trail (4WD) (Permit Required)
- Walking Trail
- Wildlife Observation Area
- Observation Tower
- Photography Blind
- Dike
- Public Restroom

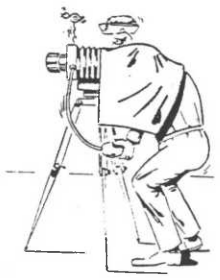
Parking for Commercial & Recreational Shellfishing Permit Holders

----- **Town Lines** (approximate)



PHOTOGRAPHY FEE & PERMIT INFORMATION

PARKER RIVER NATIONAL WILDLIFE REFUGE
Northern Boulevard, Plum Island
Newburyport, Massachusetts 01950
(508) 465-5753
(508) 465-2807(fax)



USER FEES:

* *Commercial Operations(filming commercials, shooting advertisement print work, etc.) - $100/hour plus $20/hour for a Service representative if it is deemed necessary. A Certificate of Insurance is also required naming the U.S. Fish & Wildlife Service as certificate holder with the filming company assuming all liability for losses and damages. A Special Use Permit is required(see below).*

* *Commercial Photographer(any person who sells photographs whether or not he or she operates a business for such a purpose) - a Special Use Permit is required(see below) only to access closed areas of the Refuge. $50/permit.*

* *Recreational Photographer(any person who takes photographs exclusively for personal use) - a Special Use Permit is required(see below) only to access closed areas of the Refuge. $25/permit.*

In addition to any permit fee, a Refuge entrance fee of $5/vehicle, $2/walk-on or bicycle, is charged. Season passes are available.

PERMITS:

Special Use Permit requests should be directed to the Refuge Manager and must be made in writing. Permits are subject to the approval of the Refuge Manager and are issued for specific time frames. Allow at least 2 weeks turn-around time. ***Permits are at all times subject to discretionary revocation by the Refuge Manager.***

ACCESS:

Generally, access is limited to the normal hours of Refuge operation, 1/2 hour before sunrise to 1/2 hour after sunset. Unless otherwise stated, permits do not allow for Refuge access once parking areas are filled to capacity. During the busy summer months, arriving before 9am or after 3pm will help ensure admission. Vehicle access is generally not permitted onto the beach or into closed areas.

PARKER RIVER NATIONAL WILDLIFE REFUGE
Northern Blvd., Plum Island
Newburyport, MA 01950
(508) 465-5753

GROUP PERMIT REGULATIONS

PERMITS: *All organized groups (educational or recreational) of 25 people or more must have a valid Refuge group permit to access Parker River National Wildlife Refuge. Group size is limited to one 50 seat capacity bus or a maximum of 50 people if arriving by private vehicle(s) or smaller buses. Permits will be available from Refuge Headquarters during normal business hours. Permits may be requested anytime within current calendar year but must be requested at least two weeks prior to the desired date. If possible, one rain date may be scheduled. Please notify the Refuge Headquarters as soon as possible if you are unable to make your trip so other groups can be scheduled. For additional information contact Refuge Staff.*

FEE: *Group leaders must submit an Application Form for Waiver of Entrance Fees to the Refuge Headquarters to be considered for an exemption regardless of group size.* ***No waivers will be granted at the Refuge entrance gate.*** *Fee waivers may be granted in advance of the visit if a group (arriving in private, non-commercial or commercial vehicles) meets the following requirements:*

1. *The group is from a bona fide institution established for educational or scientific purposes.*
2. *The visit to the Refuge is being made for educational or scientific purposes.*
3. *The educational or scientific purpose of the trip is related to the resources of the Refuge.*

Non-educational, non-scientific groups arriving in a commercial vehicles will pay the group rate of $20/visit for vehicles with 20 or fewer people and $30/visit for vehicles with 21 or more passengers.

Non-educational, non-scientific groups arriving in private, non-commercial vehicles must pay the entrance fee of $5.00/vehicle, buy/hold an annual pass or have a Golden Age/Access pass.

ACCESS: *Access to the Refuge for permit groups having met the requirements for fee wavier will be allowed access onto the Refuge even when filled to capacity. Other permit groups will not be allowed entry when the Refuge is filled and should plan visits to correspond with periods of less use to better ensure entry.*

PARKING: *Buses must park in designated bus spaces in Lot #1 or at Hellcat Swamp Nature Trail Parking Lot. Buses may drop passengers off at other parking lots but must return to the designated areas for parking. No roadside parking will be permitted.*

TAKE PRIDE IN AMERICA
AND
PARKER RIVER NATIONAL WILDLIFE REFUGE

PARKER RIVER NATIONAL WILDLIFE REFUGE
1994 SURF FISHING PERMIT REGULATIONS

PERMITS: *Available July 1 - November 30, 1994 for surf fishing only.*
24-Hour Walk-on: Allows overnight parking in Refuge lots with beach access by foot only.
24-Hour Drive-on: Allows 4-wheel drive vehicle access for 24 hours only.
72-Hour Drive-on: Allows 4-wheel drive vehicle access up to 72 hours. Vehicle must have self-contained toilet with 3-day capacity. Vehicle must exit Refuge to empty tank after each visit.

SEASONS: *Refuge open 1/2 hour before sunrise to 1/2 hour after sunset.*
From July 1 to beach reopening (approx. mid-August): All drive-on beach travel prohibited. All permits are good for walk-on only.
From beach reopening to Sept. 6: Beach travel prohibited 8am - 6pm. Vehicles must park in daytime parking area while on beach. Access permitted when Refuge filled (gate closed) if space is available in daytime lot.
From Sept. 7 to Nov. 30: Beach travel permitted.

BEACH ACCESS ROUTES:
* *North Beach Access: 1/2 mile south of entrance gate.*
* *South Beach Access: 4 1/2 miles south of entrance gate.*

GENERAL REGULATIONS:
* *All 4-wheel drive-on vehicles must be legally registered and have the following equipment: Spare tire, shovel, jack, board/jack support, tow rope/chain, tire pressure gauge. Snow tires are prohibited. Fire extinguishers are encouraged.*
* *Permit holder must be with vehicle while on Refuge.*
* *Vehicle travel on the beach must be above the high tide line.*
* *All persons over 12 years of age must have surf fishing gear and be actively engaged in surf fishing while on beach.*
* *Permit sticker must be displayed in lower left corner of windshield.*
* *Riding outside vehicle (fenders, roof, tailgate, etc.) is prohibited.*
* *Ruts/holes resulting from stuck vehicles must be filled by operator.*
* *Rods/lines should be kept within 20 feet of water to avoid conflicts with beach-walkers and patrol vehicles.*
* *Tent camping prohibited.*
* *Excessive driving up and down beach is prohibited.*
* *Failure to comply with permit regulations is grounds for revocation and/or Federal prosecution (see revocation policy).*
* *Daily or annual Refuge entrance fee required in addition to seasonal surf fishing permit.*
* *Seasonal surf fishing permit fees: 24-hr walk-on $5, 24-hr vehicle $15.00, 72-hr vehicle $25.00.*
* *Beach closure for shorebird nesting area will be in effect. Check Refuge for specific dates of closure.*

PERMIT REVOCATION POLICY:
Level I - Violation of permit requirements may result in revocation of permit and/or Federal prosecution.
Level II - Violation of the following regulation will result in automatic revocation of permit and/or Federal prosecution.
(1) Driving in or on the dunes or in closed areas.
(2) Presence while under the influence of alcohol or controlled substance.
(3) Possession of controlled substance.

BIRDING AND WILDLIFE OBSERVATION OPPORTUNITIES

Parker River National Wildlife Refuge
Northern Blvd. Plum Island
Newburyport, MA 01950
(508)465-5753

Birding and Wildlife Observation opportunities are available at several areas on Parker River National Wildlife Refuge. Common sightings include deer, rabbit, fox, waterfowl, songbirds, marsh and wading birds and hawks at one or more of the following areas.

Bird/Wildlife Observation Recordings	*Check clipboard located on VCS building in Lot#1 for current sightings. List your unusual sightings for others.*
Refuge Road	*Drive slowly - look for deer, fox and cottontail rabbits along road edge and open fields. Watch for Canada goose families during late Spring and early Summer feeding in fields.*
Salt Pannes Area	*Excellent opportunities for viewing waterfowl, shorebirds, and marsh and wading birds.*
Sub-HQ Observation Area	*Park in Sub-HQ lot. Observation opportunities available within 100 yards of buildings.*
New Pines Observation Area	*Park in Sub-HQ lot. Enter area at marker with yellow flagging. Stay within 10 feet of marked trail.*
Hellcat Swamp Nature Trail & Observation Tower	*Elevated boardwalk through freshwater marsh and dune habitats. Tower overlooks fresh and salt water marshes.*
Pines Trail - Lot #5	*Sand trail through shrubs and old pine stands. Look for wintering owls.*
Stage Island Area	*Park in Lot #6. Follow dike to marked trail on southeast edge of hill. Viewing of waterfowl, shorebirds and upland birds possible. Best opportunities in Spring and Fall.*
Lot #7 Observation Tower	*Tower overlooks freshwater marsh of Stage Island Pool. Look for shorebirds on mudflats and shallowly flooded areas in Spring and Fall. Great panoramic view of ocean, dunes, and wetlands.*
Nelson Island (Area C)	*Open 2/15-3/31 and 7/15-9/30 only. Park in lot at end of Stackyard Road. Open field, salt marsh and freshwater pond habitats.*

To limit disturbance to wildlife and the habitat, please stay on designated trails. Areas may be seasonally closed to protect wildlife. Access to areas is limited by available parking. <u>No roadside parking permitted.</u> Pets are not allowed in any wildlife observation area. Enjoy your visit!