

REVIEW AND APPROVALS

PETIT MANAN NATIONAL WILDLIFE REFUGE

Milbridge, Maine

and

Satellite Stations:

Cross Island National Wildlife Refuge  
Seal Island National Wildlife Refuge  
Franklin Island National Wildlife Refuge  
Pond Island National Wildlife Refuge

ANNUAL NARRATIVE REPORT

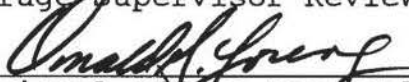
Calendar Year 1994

  
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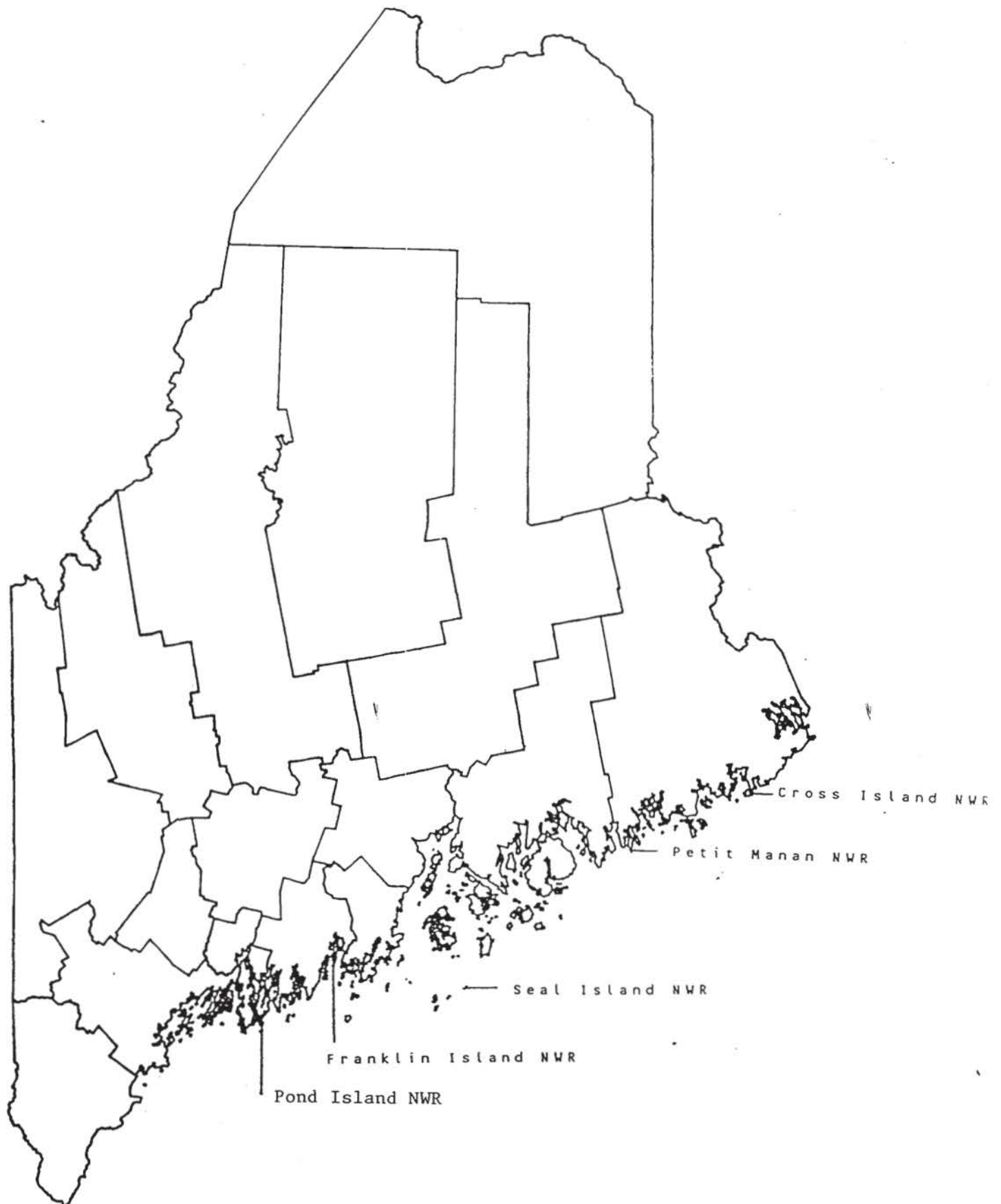
  
Refuge Supervisor Review

10-17-95  
Date

  
Regional Office Approval

10-17-95  
Date

# Maine



PETIT MANAN NATIONAL WILDLIFE REFUGE  
Milbridge, Maine

ANNUAL NARRATIVE REPORT  
Calendar Year 1994

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Appended

Cross Island National Wildlife Refuge

Seal Island National Wildlife Refuge

Franklin Island National Wildlife Refuge

Pond Island National Wildlife Refuge

## INTRODUCTION

Petit Manan National Wildlife Refuge is a 3,517 acre refuge complex consisting of 2,166 acres on Petit Manan Point, acquired in 1975 and 1976 through the Nature Conservancy; 117 acres on Gouldsboro Bay, acquired through private donation in 1994; 1,187 acres on Bois Bubert Island, most of which was donated in 1980 through the Nature Conservancy; nine acres on Petit Manan Island, transferred from the Coast Guard in 1974; five acres on Nash Island, transferred from the Coast Guard in 1983; and 32 acres in Blue Hill Bay on Ship, Trumpet, East and West Barge, and a portion of Bar Island, acquired through the Nature Conservancy in 1994. The refuge is located in the towns of Gouldsboro, Steuben, Milbridge, and Addison, in Washington County and the town of Tremont in Hancock County, Maine.

Petit Manan Point has a rugged, windswept character. Its habitats include red and white spruce forests with some mixed hardwoods, coastal raised heath peatlands, fresh and saltwater marshes, blueberry barrens, cedar swamps, jack pine stands, old hayfields, rocky shores, and cobble beaches. It is noted for its use by migrating waterfowl, shorebirds, and raptors.

At the turn of the century most of the peninsula was owned by the Maine Coast Club, a company that intended to develop the land for "rusticators". Tennis courts, a golf course, a saltwater swimming impoundment, a deer enclosure, a wharf, and even a casino were built, and portions of the Point were divided into lots. However, their expectations were never realized, and the Club went bankrupt. Most of the Point was eventually acquired by the Mague family who turned it back into a saltwater farm, using the cleared areas for sheep pasture and blueberry grounds. The old Club buildings gradually disappeared, and, aside from two old camps and a small chapel, few traces of it remain.

The Gouldsboro Bay Division is a 117 acre parcel acquired in 1994 by private donation from Francis Wood. The property is located in the upper portion of West Gouldsboro Bay and has been classified as a Class A - Coastal Wildlife Concentration Area by the Maine Department of Inland Fisheries and Wildlife due to its concentrations of waterfowl, shorebirds and bald eagles. The land consists of 40 acres of upland, 73 acres of tidal flats, and two islands totaling 4 acres.

Bois Bubert Island is much like Petit Manan Point in character and wildlife. The island runs parallel to the Point, about one mile east. Approximately 90% of the island is owned by the Service; inholdings are being acquired as they become available. Like many of the larger islands in Maine, Bois Bubert once had a village with a school, but now only a few old camps remain on the inholdings.

Petit Manan Island, named by Samuel de Champlain after Grand Manan Island, New Brunswick, in 1604, is a nine acre treeless island, two and a half miles south of the Point. Historically it has been one

of the most important colonial seabird nesting islands in the Gulf of Maine. It is also the site of an historic lightstation.

Nash Island is a nine acre treeless island approximately seven miles east of Petit Manan Point. Only half of the island is under Service ownership; the other half is privately owned. It is a former tern nesting island, but now only hosts nesting eiders and gulls.

Ship, Trumpet, East and West Barge Islands, and a portion of Bar Island were acquired from the Nature Conservancy in 1994. These islands are located in Blue Hill Bay. In 1993, a tern restoration program was initiated on Ship and Trumpet Islands through a management agreement with Nature Conservancy. Ship is an 11 acre island consisting of grasses along its edges with dense stands of raspberry and elder in the center. A bar connects Ship with 3 acre Trumpet Island at low tide. Trumpet is heavily vegetated with dense stands of wild rose, elder, and raspberry. Both islands historically supported large common tern colonies and are now nesting sites for eiders, cormorants, and herring and Black-backed gulls. East and West Barge islands are small half acre ledges supporting nesting gulls and cormorants.

Bar Island consists of 17 acres of grassy meadow, small shrubs, and spruce and represents approximately one third the island acreage.

A 102 acre portion of the 330 acre Metinic Island was acquired in 1994 from The Conservation Fund. This island, located in Knox County, has been grazed by sheep for generations and supports nesting arctic terns, herring and Black-backed gulls and eiders.

## **A. HIGHLIGHTS**

- \* January was one of the coldest on record with an average temperature of 12°F and 28" of snow falling during the month. Section B.
- \* Ship, Trumpet, East and West Barge, and a portion of Bar Island purchased through Nature Conservancy - Section C.1.
- \* Portion of Metinic Island purchased through Conservation Fund - Section C.1.
- \* Wood property in Gouldsboro Bay donated to Petit Manan - Section C.1.
- \* Island Ethics brochure completed - Section H.6.
- \* Additional storage space finally approved at Washington level - Section E.8.
- \* Terns show interest in decoys and recordings on Ship & Trumpet Islands - Section D.5.
- \* John S. Gottschalk Award presented to Petit Manan NWR by RD/DRD - Section E.8.
- \* Outstanding Contribution Awards presented to College of the Atlantic and National Audubon Society by RD/DRD - Section E.4.

## **B. CLIMATIC CONDITIONS**

The climate of coastal Washington County is moderated by the Atlantic Ocean. Summer temperatures are significantly cooler than inland areas. Weather data collected in the Machias area show an average annual temperature of 43°F, the average annual precipitation is 49 inches, the annual snowfall is 75 inches, and the average frost-free growing season is 132 days. This area receives an average of fourteen thunderstorms per year. The average tidal range is 10.9 feet. Fog is an important influence on coastal ecosystems, occurring 33% of the time during the summer months.

One of the coldest Januarys on record followed one of the warmest Decembers on record providing Downeast Maine with a true study in contrasts. For the first time in many years the immediate coastal area experienced several twenty-four to forty-eight hour periods where temperatures never rose above 0°F.; and the rough average for the month was seven degrees colder than January of 1993. Pigeon



Hill Bay actually closed over with ice on the 27th. Unusually large amounts of snow (28 inches) also fell during the period, but the significant accumulation was virtually washed away by a large Northeaster storm (17th-18th) leaving the local area with less snow on the ground than anywhere else in northern New England. To further confuse things, the month's high of 42°F was attained three times; once each at the beginning, middle, and end of the month.

Total precipitation for February was 0.89" with 6" of snow recorded. Conditions were cool and dry, and considerably moderated from the severe cold of January. Downeast Maine remained the "desert" of northern New England, with the least precipitation and least amount of snow on the ground anywhere in the area. A week of early Springlike weather towards the end of the month was capped off by a two day ice storm which left the whole coast glazed, and heralded a return to more typical winter temperatures.



Petit Manan Island shrouded in ice. JG

March and May proved to be the wettest months of the year with over 7 inches of precipitation falling. Highest temperatures were achieved in July and August at 81°F with a low for the year of -14°F in January.

The following is a summary of weather data collected for the year from a Hypothermograph and rain gauge located near Mague flowage on Petit Manan Point.

1994 Weather Data - Petit Manan Point				
Month	Average Air Temperature	Monthly High Temp.	Monthly Low Temperature	Total Precip.
January	12°F	42°F	-14°F	4.16"
February	20	56	-4	0.89
March	30	48	4	7.36
April	39	55	16	4.71
May	48	71	31	7.54
June	52	79	37	3.00
July	63	81	44	*
August	62	81	41	4.09
September	54	70	39	4.59
October	46	64	22	4.01
November	40	62	15	5.51
December	31	54	3	4.87

\* no data collected



## **C. LAND ACQUISITION**

### **1. Fee Title**

A great deal of time was invested this year on land acquisition by RM Anderson and her efforts payed off. Working together with Nature Conservancy, The Conservation Fund, and private donations the refuge acquired additional mainland and island properties. Islands acquired include Ship, Trumpet, East and West Barge, and a portion of Metinic and Bar Island. Mainland property acquired this year was the 117 acre donated parcel from Francis Wood. Several other properties are in the process of being acquired and should come on line next year. The following is a summary of these activities.

#### **ACQUIRED IN 1994**

**Mainland: Wood Donation** - Francis Wood contacted the refuge in July 1991, interested in donating 117 acres of coastal wooded uplands, with streams, associated saltmarsh and extensive intertidal areas including two islands. The area is heavily used by bald eagles year round, an active nest is located on abutting property where extensive cutting is occurring. Migrating and wintering black ducks and migrating shorebirds utilize the intertidal areas extensively.

Because delays by realty were so lengthy, an adjoining landowner had time to complete installation of a road into this relatively inaccessible area. The donor, at her sons request, decided to withdraw a 10 acre parcel with 300' of shoreline and 100' right-of-way to access. The FWS survey was completed in July 1992, approved by landowner and returned to FWS.

**January:** Solicitor approved wording regarding limitations on fencing, final deed and survey sent from RO-RE to PMN on 1/27.

**March:** 3/30 The deed of donation was recorded in Ellsworth, ME. The station, MCHT and landowner were thrilled to finally see this happen, after 2 years 8 months from initial contact by the landowner.

<b>Acreage:</b>	Upland	39.96 acres
	Island	2.78 acres
	Island	1.49 acres
	Intertidal	72.41 acres



RD Lambertson presents Francis Wood with a Special Commendation Award to show appreciation for the 117 acre property donation to Petit Manan. MA

**Ship, Trumpet, East and West Barge, and a portion of Bar Island:** This complex of islands, located in Tremont, Blue Hill Bay, was owned by the Nature Conservancy (TNC). The islands lie within Acadia National Park's approved boundary. Because these islands have been identified by the Gulf of Maine Tern Working Group as the top priority area in Maine for tern restoration TNC decided in November, 1992, to bargain sell the islands to FWS. In 1993 a two-year management lease agreement was signed to allow for tern restoration efforts to begin while the details of the transfer were negotiated. Title problems on Bar Island held up acquisition on this group of islands in 1993.

**December:** Ship and Trumpet Islands were purchased on a bargain sale agreement from Nature Conservancy. East and West Barge and a portion of Bar Island donated to the Service.

<b>Acreage:</b>	Ship	11.2 acres
	Trumpet	3.2 acres
	East Barge	0.5 acres
	West Barge	0.5 acres
	Bar Island	17.2 acres

**Metinic Island:** This 300 acre island, located seven miles offshore from the town of St. George, supports an active tern colony and nesting eiders. Critical habitat was threatened with sub-division and development, which resulted from a court order settling a family dispute on ownership; See NR92. Acquisition of 102 acres, containing the tern colony, has been under negotiations involving FWS, Maine Department of Inland Fisheries and Wildlife, and Conservation Fund. In 1993 title problems prevented this parcel from being acquired.

**May:** 102 acre parcel acquired from Conservation Fund.

<b>Acreage:</b>	Upland	82.29 acres
	Intertidal	20.13 acres

#### **ONGOING ACQUISITION ACTIVITIES:**

**Thrumcap Island:** This 4 acre island in South Bristol has been designated Essential Habitat for Roseate terns by the Maine Department of Inland Fisheries and Wildlife. The refuge is working with the Gulf of Maine Project and Damariscotta River Association on this island.

January: Suggested language to incorporate into option agreement to purchase from Maine Coast Heritage Trust to RE for comment.

April: The island was appraised at \$70,000 by MCHT. In April, a decision document was signed by the Regional Director; an offer has been made by FWS based on fair market value. The seller countered with a bargain sale price.

October: Contaminant survey completed.

**USCG Islands** - During the mid 1970s four islands were transferred in fee from the USCG to the FWS; two other island have five year management lease agreements. In 1993, Ted Dernago, RE Specialist, USCG was contacted to confirm USCG island ownership, discuss existing management lease agreements. Mr. Dernago indicated the USCG was currently reviewing all island properties for excess. Manager Anderson indicated that FWS would be very interested in acquiring several USCG islands (ie. Little Libby, Two Bush, Egg Rock). The 1994 summary follows:

January: Dernago sent a package with maps, contacts for maintenance records, acreage and ownership patterns. RM Anderson met with John Wilson RO Archeologist, and it was decided field visits and photos of structures should be conducted in Spring 1994.

Rest of Year: No site visits were conducted and talks stalled on transfer. Island Institute may accept transfer through a bill in Congress and then transfer four lighthouse islands to Petit Manan. Islands for consideration include Libby, Two Bush, Matinicus Rock, and Egg Rock.

**Bois Bubert:** 6/20 Julian Gerard sent willing seller letter to RO for his 5 acre inholding with a small camp. He has been thinking about this for 2 years, unfortunately, now he wants instant money. There are a total of 7 inholders on this island.

**Eastern Brothers Island** - This 23 acre island in Jonesport, is a recognized seabird nesting island and historical area for nesting peregrine falcons. The Maine Department of Inland Fisheries and Wildlife owns Western Brothers; the two islands are joined by intertidal flats. There are no structures; however, sheep graze the island yearround, and public use has increased. In July 1993, owners met with refuge to discuss FWS ownership and conservation options. Willing Seller Letter sent to RO. In December 1993, Melberg-RE met with owners to discuss various longterm protection options for the island; owners expressed an interest in selling. RE sent a letter of commitment to have the property appraised in the near future. 1994 summary:

June: 6/17 Level I Contaminant Review completed.

December: Appraisal scheduled early 1995.





Aerial View of Eastern and Western Brothers SR

**Hog Island:** This 30 acre island is located in Machias Bay. It supports nesting eider ducks, is an Internationally Significant concentration area for shorebirds, has an active bald eagle nest and 27 early design petroglyphs. The cover is predominantly spruce and fir with open areas on the southwest end of the island. It currently has a 18'x32' camp. The island could be subdivided into four buildable lots.

1992: Refuge receives a letter offering property - \$250,000

July 1994: Willing seller letter sent to realty - \$179,000.

**Outer White:** This 13 acre island is located in Boothbay, Lincoln County. It is treeless with high cliffs and a grassy upland and supports nesting gulls, eiders, and guillemots. 1994 summary:

July: Level I Contaminant Review conducted by Booth Bay Regional Land Trust.

August: Purchased by Maine Coast Heritage Trust, Damariscotta River Association, Boothbay Regional Land Trust with the intent to transfer to FWS when funds become available.

### 3. Other

Natural Resource Protection Act - Colonial Nesting Seabirds: MDIFW held public hearings on proposed NRPA ruling for colonial nesting seabirds. Apparently only one objection was filed by Atlantic Salmon Inc.(ASI) in regards to the 1/4 mi. buffer. On 12/31 Maine Department of Inland Fisheries and Wildlife was supposed to finalize the process before the Commissioner's Advisory Council for DEP rule making; however, the ASI Attorney, Libby Butler, managed to have it removed from the agenda. MDIFW hopes to work out problems in time for February.

In March, Managers Anderson, Mullen, and Sweeny met with Senator Mitchell's, Cohen's, and Congresswoman Snowe's Bangor staff for a presentation by Realty on land acquisition status in Maine.

Maine Coastal Islands Project: In 1992, the Service developed a preliminary Project Proposal identifying approximately 400 Maine islands as important habitats for coastal living resources. The Proposal was approved in July 1993, giving the Service authority to prioritize and plan for protection of the islands. In 1994, working with the State, private organizations, and the Gulf of Maine Project, a Resource Weighting Criteria was developed to prioritize islands for their protection. The Gulf of Maine Project gathered all available resource data from FWS, and Maine Inland Fisheries and Wildlife and compiled a database for island ranking based on this weighting criteria.

In July, Maine Coast Heritage Trust hosted a planning meeting in Augusta. Attendees included representatives from Damariscotta River Association, The Nature Conservancy, Conservation Fund, Boothbay Regional Land Trust, Georges River Land Trust, Vinalhaven Land Trust, Island Institute, Harpswell Heritage Trust, Lower Kennebec Regional Land Trust, Phippsburg Land Trust, Maine Coast Heritage Trust, Gulf of Maine Project, C.Melberg, and RM Anderson. FWS panels, video, islands important to wildlife, proposed process/strategy for public notification and partnership support were discussed. The last topic was discussed at great length. Agreement on a strategy was finally realized; FWS would send final notification packet to attendees prior to island owner notification.

In August, Maine Coast Heritage Trust met with a less than friendly reception in Lubec regarding reduced tax payments for property they own. This reception and upcoming elections caused partners great anxiety about going public on MCIP. Everything was put on hold. 8/22 meeting held in RO to brief RE,RW,NAWMP, GOMP, NFWF on progress.

Island Aerial Survey: On 18 November, RM Anderson, Realty Specialist Sue Russo, and Schick made a 2 1/2 hour overflight of 20

islands which were either potential acquisitions or comparables to be used in the appraisal process.

#### **D. PLANNING**

##### **2. Management Plan**

**Biological Goal Setting Session:** During November Biologist Megyesi worked hard at developing an agenda and contacting participants for the Biological Goal Setting Session to be held December 6-8. Megyesi and Benedict met with Jerry Longcore and Dan McCauley of NBS on November 16 to provide the group with background information on our biological program and future research needs. The three day Biological Goal Setting Session was attended by representatives from Maine Inland Fisheries and Wildlife, NBS, FWS, National Audubon, and College of the Atlantic. Productive discussion on topics ranging from deer to seabird management will aide the refuge in the development of goals and objectives to guide future biological activities.

##### **4. Compliance**

**Compatibility - Secondary Uses:** 2/13 Secondary Use Inventory submitted to RO to meet requirements of recent Lawsuit. Solicitors Opinion requested on regulating use within intertidal zone on seasonal periwinkling activities.

4/7 A joint solicitor's request for opinion was submitted for Maine Coastal refuges on whether or not the FWS has jurisdiction to regulate the following:

- \* recreational/commercial activities within the intertidal zone owned in fee title by FWS, and
- \* commercial/recreational use of ocean waters within 1/4 mi. of MLW off FWS owned lands.

8/3 Compatibility Determinations completed after a marathon weekend.

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

###### **Cooperative Agreement:**

**College of the Atlantic** - Five-year cooperative agreement signed in April 1993 to continue seabird research at Petit Manan Island.

Spencer-Famous Consultants - One year cooperative agreement signed in February 1994 to continue Neotropical migrant study.

#### **Memorandum of Understanding:**

Eagle Hill Wildlife Research Station - One year understanding signed in December 1994 for upcoming season on Petit Manan Point.

#### Investigation of Organochlorine and Heavy Metal Contamination in Arctic Tern Chicks and Eggs. Jennifer Megyesi, Refuge Biologist

Analysis of the samples collected in 1993 revealed no evidence of organochlorine or heavy metal contamination in Arctic Terns on Petit Manan Island. Although this result is encouraging, the sample size of 11 eggs and 2 chicks is small, and may be inconclusive as evidence that the entire population is contaminate-free. Funds are being pursued for further testing in this and other species.

#### Petit Manan - "Management and study of nesting seabirds at Petit Manan National Wildlife Refuge." Dr. John Anderson, College of the Atlantic

##### 1993 Objectives:

- \* Maintain or increase nesting populations of Common, Arctic and Roseate Terns.
- \* Maintain or increase nesting populations of Common Eider, Laughing Gulls, Black Guillemots, and Atlantic Puffins.
- ## Conduct daily censuses from the lighthouse tower of Atlantic Puffins, Black Guillemots and Razorbills loafing on Petit Manan, record all banded birds observed.
- ## Determine all locations of nesting puffins by observing for fish feeds from the lighthouse tower, and band all Atlantic Puffin chicks at the conclusion of the season. Map all puffin nests and general guillemot nesting areas.
- ## Band a portion of the Black Guillemot chicks on Petit Manan Island at the conclusion of the season.
- \* Increase nesting populations of Roseate Terns in accordance with goals outlined in the Roseate Tern Recovery Plan.
- \* Continue scientific investigations and initiate new studies to enhance and facilitate tern recovery effort.



- ### Extend baseline data on tern numbers, nesting habitat, and productivity from previous years, and continue to develop and apply techniques suitable for long-term monitoring of the island.
- ### Expand the existing computerized GIS database for Petit Manan Island.
- ### Monitor the presence of Herring and Great Black-backed gulls, and the effects of predation and competition for nesting space on eiders, terns and Laughing Gulls nesting on Petit Manan and Green islands.
- ### Continue banding Arctic, Common and Roseate terns.
- ### Investigate and monitor the effects of experimental habitat alteration designed to attract terns to establish nesting territories.
- ### Investigate the effects of human disturbance and census techniques on estimates of tern productivity.
- ### Use standardized techniques for monitoring prey utilizing among the island's seabird.
- \* Record occurrence and approximate abundance of passerines on the island throughout the season.
- ### Note any nesting or territorial behavior among songbirds.
- \* Establish schedules for visits and prepare programs and guided tours for visitors to the refuge to maximize the information process and minimize the disturbance on nesting birds and the research program.

Since 1984, we have annually issued a contract to maintain and monitor seabirds on Petit Manan Island to the College of the Atlantic. This year, a \$5,500 contract was awarded with an additional \$3,000 awarded to analyze blood samples from Common and Arctic terns for gender determination and relatedness.

The field crew this year consisted of John Anderson, Professor of Zoology, COA; Kate Devlin, Research Associate, COA; and student interns Samantha Smith, Kris Yaggi and Derren Rosbach. Preliminary visits by the field crew were made on May 11 and 27 and June 3; researchers arrived on the island on June 8 and departed on August 10.

## a. Gulls

### *Laughing Gulls*

A total of 561 active Laughing Gull nests were counted on Petit Manan Island in 1994. Petit Manan continues to be the northernmost colony for Laughing Gulls, and as such it is regarded as an important component of the island's biodiversity. However, the refuge is also monitoring the effect of encroaching Laughing Gulls on nesting Roseate Terns. Although the gulls do not prey on tern chicks or eggs, they may compete for nesting space (this has not been documented, though a decrease in Roseate Terns was observed in one area where Laughing Gull nest density had concurrently increased). Furthermore, in 1993, Laughing Gulls were found in 16 of the 30 X 30 m grid squares on the island, whereas in 1994, the gulls had increased their nesting territory to 37 of the grid squares. Plans to manipulate the habitat to discourage further spreading of the gulls are scheduled for the 1995 field season.

### *Herring and Great Black-backed gulls*

As many as 222 were observed loafing along the shore of Petit Manan during 1994. Much of these were immature Great Black-backed gulls that appeared at the end of the season. These birds do not usually interact with nesting terns, guillemots or puffins; however, four Herring Gulls nested on Petit Manan during 1994. Two birds were shot and all four nests were destroyed. One of the nests was located in an area where Roseate Terns typically nest but were absent during 1994. A patrol earlier each season to remove these nesters is planned. Several Laughing Gull fledgling carcasses were found which may have been preyed on by the larger predatory gulls. No evidence of tern predation was observed.

## b. Terns

Terns were observed in small numbers around the island on May 11, and by June 3, the first eggs were found. First pipped eggs were observed on June 18. This is within one week of the first eggs observed hatching in 1991, 1992, and 1993. The first fledgling was observed on July 12.

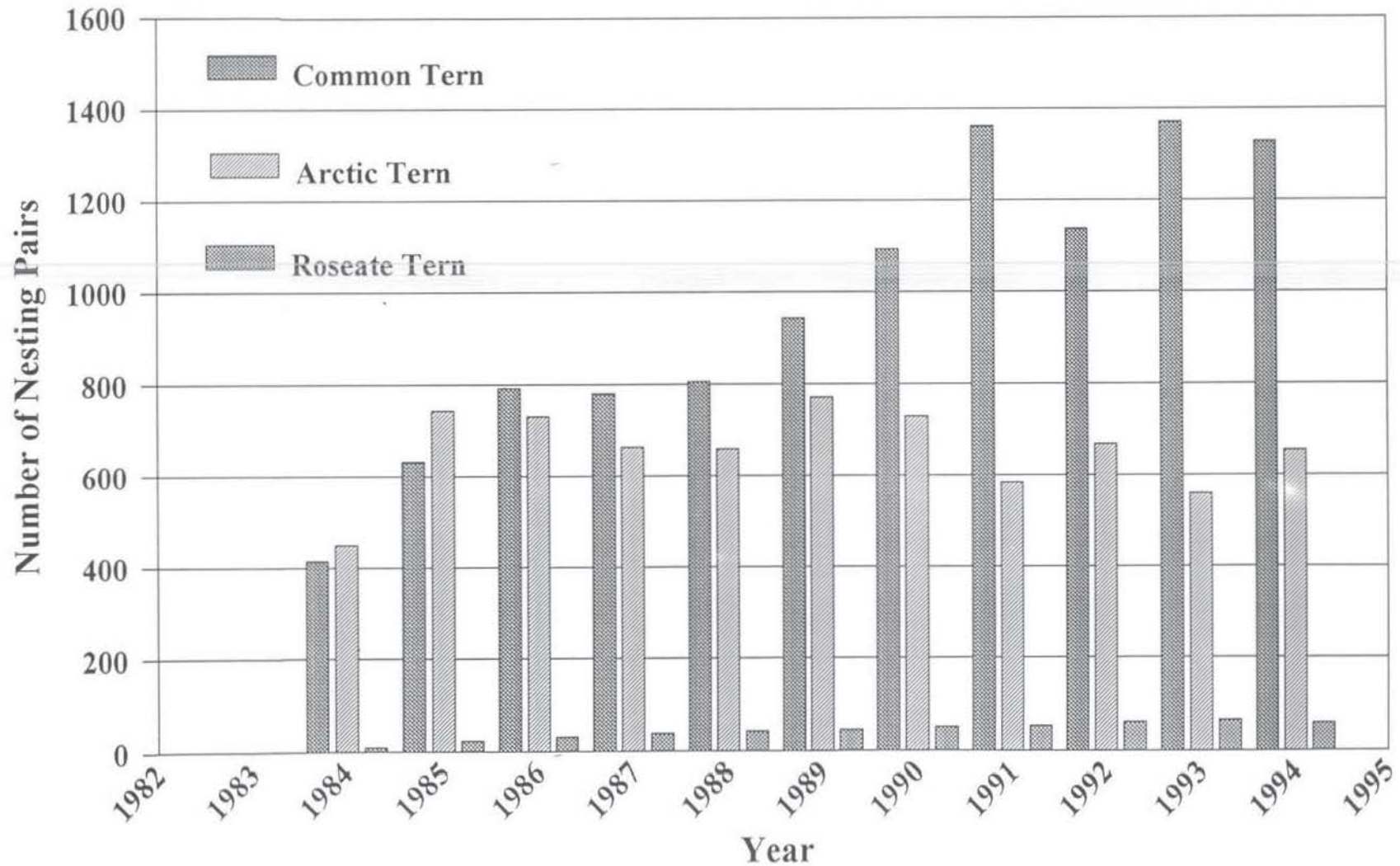


Tern numbers on Petit Manan Island appear to be stabilizing at around 2000 nesting pairs. MB

An island-wide nest count on June 17-18 revealed 1,864 nests. A Lincoln Index recapture revealed a 6.0% rate of error, for a corrected island total of 1,983 tern nests. Species identification by observed incubation and/or chick feeding in a stratified random sample of nests gave a ratio of 67% Common to 33% Arctic terns. The shift from predominantly Arctic to predominantly Common is not a function of a total decrease in the number of nesting Arctic Terns. Rather, the Common Terns appear to be increasing more rapidly than the Arctic Terns. Overall, it appears that the tern colony on Petit Manan may be stabilizing (Fig. 1). A total of 59 Roseate Terns nested on Petit Manan during 1994. This decrease from 65 in 1993 may be the result of a Herring Gull nesting within one of the Roseate Tern nesting clumps.

Tern reproductive success was determined from chicks in two plots and observed from the lighthouse tower. Average Arctic Tern reproductive success was 0.88 chicks/nest (SD = 0.44, N = 25) average clutch size for Arctic Terns was 1.77 (SD 0.45, N = 47, range = 1-3). Common Tern reproductive success averaged 1.2 chicks/nest (SD = 0.6, N = 48); average clutch size was 1.99 (SD = 0.53, N = 150). Tern productivity is based on survival to 15 days. However, this may not reflect true productivity, as there is some evidence that substantial mortality occurs after 15 days,

Fig. 1. Population trends of terns on Petit Manan Island





especially in seasons with fog and rain during the accelerated growth period, when both parents must fish for their chicks. It is not possible to follow chicks for more than 15 days, as they are capable of flight and may go unnoticed by researchers after this date. Productivity estimates will be derived in the future by subtracting all dead chicks found within the plots or on the island after 15 days from the estimates.

Roseate Tern productivity was not estimated; however, 8 of 59 Roseate Tern nests did not hatch. Average clutch size for roseates was 1.44 (SD = 0.52, N = 59).

Prey species observed fed to Arctic and Common tern chicks was primarily Herring (Fig. 2).

Blood was drawn from 49 Arctic and Common terns. No analyses were completed in 1994; additional samples and results will be compiled for 1995. Interestingly, four of the six previously banded Arctic Terns captured on Petit Manan were hatched on the island during 1986.

There have been several discussions concerning trapping adult Roseate Terns on Petit Manan Island. The Refuge was asked to participate in a metapopulation study initiated by researchers in Massachusetts and Connecticut. It was felt that by leaving the Roseate Terns which nest in Maine out of the equation, unanswered questions would remain as to why this federally endangered species is not recovering. However, several complicating factors must be considered before including the birds on Petit Manan in the metapopulation study. First, preliminary results will be obtained only after eight or more years of research are done on Petit Manan, according to discussions held in August 1994 at the Gulf of Maine Tern Working Group meeting. Second, the adult roseates on Petit Manan have never been trapped. Responses to being trapped in colonies in Massachusetts, New York and Connecticut varied widely, with as much as three hours lapsing between when a bird was trapped and when it returned to its nest. Refuge personnel are concerned that a response as extreme or more extreme as those observed in southern colonies may be detrimental to nesting roseates on Petit Manan, considering the difference in climate. In 1994, 35 of the 50 days the field crew spent on the island were blanketed in dense fog which raises the question of achieving resighting objectives. Whether the fog would adversely affect Roseate Tern hatching success is unproven, but refuge staff are reluctant to experiment with the small number of nesting pairs there without conclusive management benefits derived from participating in the metapopulation study. Instead, efforts to assess reproductive success, band chicks, and identify all banded adults will be concentrated on in future seasons. Interestingly, six banded Roseate Tern adults were observed; two of these were hatchlings from Petit Manan, one was hatched on Eastern Egg Rock, two were hatched on Great Gull Island, NY and Bird Island, MA,

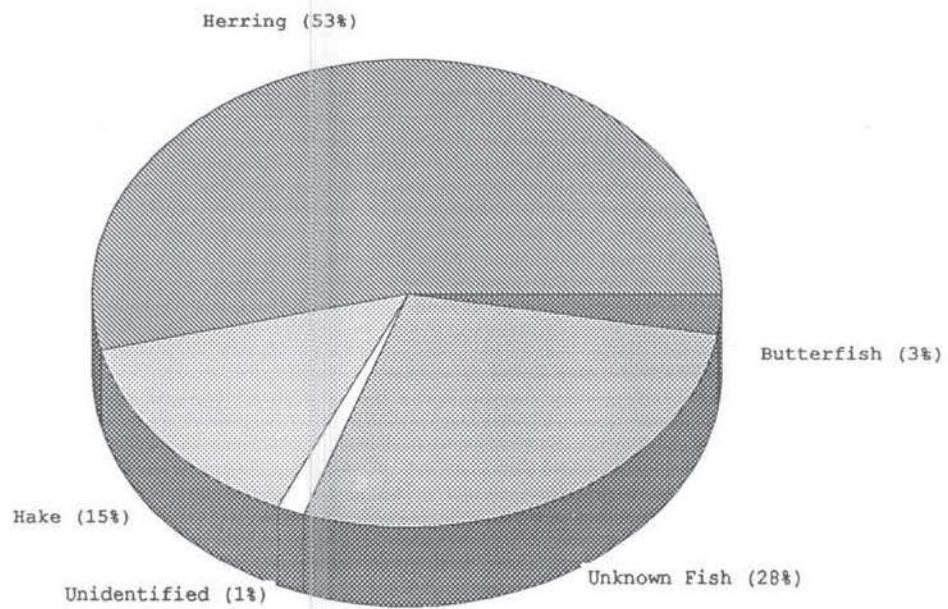


Figure 2. Prey used by Common and Arctic terns on Petit Manan Island.

respectively, and one was banded as an adult on Cedar Beach, NY.

c. Black Guillemots

A maximum number of 168 guillemots were observed on Petit Manan's shoreline on July 27. The research team on Petit Manan was concerned that the total number of guillemots on the island has decreased. In 1995, a comprehensive population estimate will be made to determine if the decrease is real or if it is a function of bad weather and fewer opportunities to estimate nests and number of chicks fledged.

d. Common Eider

On June 3, a nest count conducted on Green Island revealed 901 nests. This, by all estimates, was a conservative count, as some eiders were hatching and these areas were done quickly. A biennial count will be conducted to monitor the eider nesting population. Thirty-five nests were found on Petit Manan Island. Average clutch size was 3.56 eggs (SD = 1.11, range = 1-5 eggs).

Large flocks of rafting eiders were again observed off the shore of Petit Manan and Green islands during late July and early August.

e. Atlantic Puffin

Although Petit Manan is not considered typical nesting habitat for puffins, it may be attractive to them because it is gull-free, and because Black Guillemots nest on the island. It is one of five islands with nesting puffins in the Gulf of Maine. Although puffins are not globally endangered, they are locally rare and as such are crowd pleasers. In 1994, the tour boat *SEAL* voyaged from Bar Harbor each day in search of puffins and other seabirds.

Artificial burrows were built on Petit Manan Point during 1991. However, chicks from these burrows appeared soiled when compared to chicks found in natural burrows. The floors of the artificial burrows were built directly on the granite shelf of the point, and as such lacked any absorbing qualities for rain, ocean spray, or defecant. In 1994, the burrows were destroyed to dissuade puffins from nesting in them. Nonetheless, in August, eight nests were found, and six fledglings resulted (the same number presumed fledged during 1993). We anticipate an increase in the number of nesting puffins in 1995, despite a lack of abundant suitable habitat.





Petit Manan Island produced eight puffin nests with six known fledglings which were banded in August. AM

f. Razorbill Auk

Razorbill auks were recorded on Petit Manan on 21 of 51 days. As in previous years, they were observed entering puffin burrows and rock crevices, though no nesting attempts were recorded. The high count of loafing razorbills was 25 on July 16.

Razorbills nest on just four islands in the Gulf of Maine and are one of the rarest seabirds in the world. Attempts to restore their nesting range to historical levels are concentrated on Seal Island NWR due to the dearth of suitable habitat on Petit Manan.

g. Leach's storm-petrel

Throughout the field season, storm-petrels were heard calling on the island. Surveys using night-vision equipment revealed small clusters of burrows on the east and south sides of the island. A total of 20 burrows were found, though the nesting population may be 50 pairs or more. A more detailed survey of the petrel population will be conducted in 1995.





Ship Island base camp with all the comforts of home including driftwood furniture. JDM

#### Ship and Trumpet Restoration

The second year of tern restoration at Ship and Trumpet got off to a rocky start. However, results were promising and all involved with the project are hopeful that terns will nest on the islands in 1995. Erica and Jeff Desmond-Miller were the research crew, directed by Dr. John Anderson, College of the Atlantic. A total of \$2,500 was obligated to the Ship and Trumpet restoration project. The research crew was on the island from June 10 to July 26, 1994.

##### a. Gulls

Two applications of the gull toxicant DRC 1339 were administered on Ship, Trumpet and Eastern Barge islands. On May 24, the first treatment was applied to 94 Great Black-backed, 95 Herring and 113 empty nests, resulting in a kill of 64 Great Black-backed and 101 Herring gulls. During the second application, 19 Great Black-backed, 22 Herring and 97 empty nests were baited, resulting in a kill of 11 Great Black-backed and 19 Herring gulls.

On May 24, refuge personnel were met on the boat ramp by a local opponent to the restoration project. Personnel were also confronted on May 26 by a different individual. Finally, on June 8, six cars blocked the boat ramp exit at Seal Cove. The opponents

explained that they were forming a petition against the project, though no complaints or petition requests were filed with congressional delegates. On September 3, 1995, a local radio station, *WERU* announced that the USFWS was poisoning gulls in the Blue Hill Bay. Refuge Manager Anderson responded promptly to the DJ, and sent information concerning the project to the station.

Five adult Great Black-backed gulls and four chicks were killed later in the season, as these gulls had set up territories within the area that had been chosen to attract terns. No owl predation on gulls was noted during 1994, though some cannibalism was present.



Wooden decoys and a CD sound system enticed terns back to Ship Island.  
JDM



#### b. Terns

A total of 93 wooden decoys were placed on the western shore of Ship Island, near a sandy shoal, along with a CD sound system which emitted recordings of a tern colony. Within 16 hours, Common Terns appeared near the decoys and flew around them. On June 22, Megyesi observed a Common Tern attempting to feed a decoy a fish. Terns were also observed copulating on June 24. A high count of 33 terns were observed on Ship Island on June 21. Both Arctic and Common Terns were observed. No nests were found, though several scrapes were noted among the decoys. Terns were also observed flying around Trumpet Island, but because the researchers did not spend large amounts of time on Trumpet, it is not known whether terns landed there.

#### c. Cormorants

Double-crested cormorants nest on both Trumpet and Eastern Barge islands. The gull control efforts may have been responsible for the failure of the 15 nests on Eastern Barge. On Trumpet Island, 125 nests were counted, and the colony appeared to be unharmed by the human activity.

#### d. Common Eider

Ship and Trumpet are historic eider nesting islands, and both carry healthy populations. Plans to monitor the effects of gull control on the eider population are slated for 1995.

#### Neotropical Migrant Cooperative Study

Norman Famous conducted a cooperative study between Petit Manan NWR, the National Park Service, The Nature Conservancy, Campobello Provincial Park and the Roque Island Association on neotropical landbirds in Maine and New Brunswick. Famous received \$5,000 from Petit Manan NWR to conduct the study.

Seventy-eight fall migration point counts were regularly censused from August through October at 6 coastal sites. International Shorebird Surveys were conducted in association with fall migration point counts at several important shorebird staging areas. Both breeding season and fall migration point counts monitor species not currently monitored by other methods.

Sample sizes adequate for statistical analysis were obtained, or should be obtained with increased sampling in 1995, for 44 species (28 neotropical migrants) recorded on coastal breeding season point count routes.

Significant breeding season findings included large population changes in Bicknell's Thrush (found on 7 coastal point count routes in 1993 but absent in 1994) and regular numbers of Merlin, Boreal Chickadee, and Blackpoll Warbler. Two disjunct Clay-colored Sparrows were found at opposite ends of New Brunswick.

## E. ADMINISTRATION

### 1. Personnel



(Left to Right) Anderson, Benedict, Kimmel, Schick

1. Margaret M. Anderson, Refuge Manager, GS-12, PFT, EOD 6/15/91, transferred in from Lee Metcalf NWR, MT.
2. Brian E. Benedict, Supervisory Refuge Operations Specialist, GS-11, PFT, EOD 8/7/92, transferred in from Edwin B. Forsythe NWR, Barnegat Division, NJ.

3. David Schick, Maintenance Mechanic, WG-9, PFT, EOD 4/18/88.
4. Jodie L. Kimmel, Office Assistant, GS-5, PFT, EOD 9/30/91.
5. Jennifer Megyesi, Coop. Biologist Trainee, GS-7, EOD 6/17/92, transferred in from Pacific Islands Complex.



Coop. Student Jennifer Megyesi AM



Staffing Patterns for the Last Five Years

	<u>PFT</u>	<u>COOP</u>	<u>TFT</u>	<u>T/IPT</u>	<u>Ttl. FTE</u>
FY 90	1	0	3	2	4.0
FY 91	2	1	3	1	3.0
FY 92	4	1	0	2	4.0
FY 93	4	1	0	0	4.0
FY 94	4	1	0	0	4.0

Seasonal fire crew started at Petit Manan on 11 April. The crew consisted of two firefighters, Larry Anderson, and David Hamilton, and were shared on an equal basis with Sunkhaze Meadows NWR. Unfortunately, firefighter Hamilton suffered a grand-mal seizure while working at Sunkhaze Meadows on the 18th of April, keeping him from continuing employment as a firefighter. Anderson continued helping the refuge through September on projects ranging from prescribed burning to assisting with the International Volunteers for Peace.

#### 4. Volunteer Programs

Petit Manan has a very vibrant volunteer program. Volunteers play a critical role in the seabird research program conducted on Petit Manan Island. This year 36 volunteers contributed 3805 hours assisting with research and maintenance tasks.

Bill Mague continued his support to the refuge by mowing fields and roadsides, and plowing and grading the road on Petit Manan Point. In addition to this, Bill also has been kind enough to allow us to use his barn as winter storage for refuge boats and equipment.

Hannah Sanders, a student at the University of Maine, volunteered for the refuge during the summer months to do a senior history project. She focused on collecting life histories of octogenarians who have spent time on the islands and points, especially those in close association with the refuge. At the end of her stay she provided the refuge with a final report and copies of the taped interviews.

On July 9 Ron Lambertson and Cathy Short presented Outstanding Contribution Awards to College of the Atlantic and National Audubon

Society for their years of volunteer contributions for colonial seabird restoration efforts at Petit Manan and Seal Islands. The ceremony was held at Acadia National Park Headquarters due to foggy conditions which prohibited the ceremony from taking place on Petit Manan Island. On July 10 Lambertson and Short toured Seal Island with RM Anderson and Schick and were treated to a lobster dinner prepared by Rick Schauffler. The group had a splendid day and were treated to sightings of Wilson's petrels and a group of 30 shearwaters.



Outstanding Contribution Awards were presented to National Audubon and College of the Atlantic for their years of volunteer support on seabird nesting islands. JK

From July 12-15 Sven Weyns, a Belgium native, volunteered 32 hours to the refuge assisting with staining the rainshed and with the construction of the privy on Petit Manan Island.

International Volunteers for Peace: During August the refuge hosted two groups of International Volunteers for Peace (August 15-19, August 22-26). The volunteers represented the countries of France, Belgium, Germany, Italy, Spain, England, and Denmark. During their stay the volunteers were housed on Petit Manan Island and worked on the following projects: Extending the boardwalk towards the lighthouse, moved leftover boardwalk lumber into winter storage in the generator building, stained the fog signal building and trim for the new privy, cleaned the interior of keepers house and

generator building, constructed a drainage field for new privy, and cleared the boathouse foundation site. During their two week stay the volunteers donated approximately 450 hours of labor.



International Volunteers for Peace donated 450 hours of labor during their two week stay on Petit Manan Island. BB

##### 5. Funding

The following is a five year funding summary for this station:

	<u>Allotment</u>	<u>Salaries</u>	<u>Travel and Fixed Costs</u>	<u>Operating Balance</u>
FY 90	309,396	70,646	7,750	217,000
FY 91	225,768			
FY 92	221,221	74,981	21,750	108,716
FY 93	255,228	83,193	20,200	148,134
FY 94	253,350	175,650	12,700	65,000



## **6. Safety**

A four drum oil spill containment pallet was installed behind the shop along with a new 55 gallon holding drum for waste oil and solvents.

Annual Safety Inspections were held during September with Benedict conducting an inspection of Moosehorn NWR on the 26th and Ray Varney visiting Petit Manan on the 30th.

A GSA contractor conducted a fire safety inspection of the office and storage areas on 27 October.

A GSA contractor conducted a safety inspection of the office and storage areas on 29 November. Nothing of note was found except that the building measured high for CO2 concentrations ( $\geq 1000$  ppm). The inspecting contractor stated that they usually recommend ventilation at these levels.

## **7. Technical Assistance**

Jodie Kimmel provided computer training throughout the year to nearby stations. She provided CC:Mail training to secretaries from Green Lake and Craig Brook NFHs and Windows WP6.0 training to Green Lake staff.

## **8. Other**

Property Management: Papers finally arrived from GSA/CGS authorizing the local sale of the 1979 Dodge Pickup. Notices were posted and a schedule established for the vehicle's inspection and final bid date. Eighteen individuals who had previously inquired about the vehicle were contacted and informed of the sale. The truck was finally auctioned off locally on 11 March. The successful bidder (\$513) removed the vehicle on 17 March; and our accountability was terminated on 30 March. It is a pleasure to see the empty space in the boneyard (the vehicle was excessed in trade 1991).

Office Expansion: Approval for additional office storage space has finally been approved in Washington after a 2+ year wait. The additional storage will provide the refuge with much needed boat and hazardous materials storage.

On July 22, Chuck Kadis from GSA visited the refuge to review possibilities for the future storage facility. A meeting was held with the owner of Drop Anchor Realty to look at an existing building between Drop Anchor and the Milbridge Post Office. The space would have to be added on to in order to accommodate our needs and the owner would need to purchase the adjacent lot to

expand. We also reviewed the site for building a storage building at the existing office site. The refuge expressed concern that this storage be built or leased prior to winter.

At years end we seemed no closer to realizing additional storage or office space. The GSA process seems extremely slow and frustrating.

Collocation with Maine Anadromous Fish began April 18th with the arrival of Eric Morrison a fisheries bio-tech. Chris Bernier and Ken Sprankle joined him in May. The team will be responsible for gathering field data on the Down East salmon rivers over the next three years.

Gottschalk Award: On July 9th, RD Lambertson and DRD Short presented the refuge with the John S. Gottschalk Award for the refuges work in developing effective partnerships with outside organizations. The presentation was held at the Acadia National Park Headquarters.

### Staff Training:

<u>Staff</u>	<u>Dates</u>	<u>Meeting/Function</u>
MA	1/3-7	Alternative Sources of Funding & Advocacy, 40 hrs, Hadley, MA
MA	1/25-27	Compatibility, 24 hrs, Hadley, MA
BB	2/14-2/16	Fire Behavior S-390, 60 hrs
JK, BB, MA	2/22	Defensive Driver Training - 5 hrs
JK		Computer Training - 12 hrs
BB, JK	3/16-17	Visa Card Training, Concord, NH
BB	3/22	Master Pesticide Applicator Testing, Augusta, ME.
DS	3/9	Maine Driving Dynamics Course
MA	4/11-15	LE 40 hr annual refresher, Eastern Shore, VA.
BB	4/18-22	" "
BB, DS	5/16-20	Fire: Pumps & Saws, Milford, ME 40hr
MA, BB	6/27&28	GIS, Moosehorn NWR, 16hr
JM	6/27	GIS, Moosehorn NWR, 8 hr
BB	9/6-9	Biological Workshop, Laurel, MD

## **F. HABITAT MANAGEMENT**

### **2. Wetlands**

There are over 300 acres of freshwater wetland and 200 acres of saltmarsh on Petit Manan Point and Bois Bubert Island. The largest and most productive freshwater marsh on the point was created from

a heath in the late 1800's by the construction of a stone dam that was to provide water level control for cranberry production. Two other smaller dams built years ago were "improved" by beaver and provided good waterfowl habitat.

In the past the beaver were taken for granted since they kept the dams in reasonably good repair and kept the water levels within reason. During the last several years, the beaver were not up to the task of maintaining the dams due to low food supply and shallow pond depths which often froze the beaver out. In 1989, the decision was made to replace the existing dams with earthen dikes and watercontrol structures. Mague and Meadowbrook were completed in 1990. In the fall of 1993, Cranberry dike was completed. Water levels at Cranberry were held at low levels throughout the winter and spring period to allow the dike to settle. In April 1994, a water gauge and oak stoplogs were fabricated and installed with water levels reaching desired elevations by early May.



The refuge hosted a Ducks Unlimited dedication for the Cranberry Marsh dike reconstruction. RW

On September 9 the refuge hosted a DU dedication for Cranberry Marsh. Participants included Phil Poux, Regional Director for Maine and New Hampshire, James Konkell, Regional Vice President Northeast Atlantic Flyway, and C.D. Armstrong, State Chairman- Maine. Others in attendance included Kelly Jordan, President Ellsworth Chapter

DU, other chapter members, Alan Lewis, Professor of Ecology, University of Maine at Machias, and Bill Mague. The group met at the Birch Point Parking Area and carpooled to the entrance road to Cranberry. A display sign and flags were set up on a rise overlooking the marsh. The ceremony included speeches by Poux, Benedict and Jordan. After the ceremony the group split in two with one group walking to the back of the marsh and the other travelling to the newly constructed dike. The group was treated to flights of black ducks and teal circling back into the large crop of wild rice.

After three seasons with no problems, the pipe at Mague flowage was found to have "piped" slightly. The subsidence on the east side of the pipe was discovered on 7 April. It appears that the problem is a combination of large pipe diameter (4'), and the spring freeze and thaw cycles, coupled with the hydrostatic pressure exerted by the full pool which was maintained over the winter. This pattern has shown itself more dramatically at Meadowbrook dike, which has failed twice. For whatever reasons, Mague dike resealed itself and is holding water with no apparent further loss of material. At some point, however, it will probably have to be repacked.

### 3. Forests

Much of Petit Manan Point and Bois Bubert can be classified as commercial forest, chiefly second-growth red, black, and white spruce, white cedar, and larch, with mixed hardwoods such as red maple, paper and yellow birch, mountain ash and alders. There are also some jackpine stands on both units.





Mountain Ash berry production on Petit Manan Point was the best in memory according to longtime resident Bill Mague. BB

## 5. Grasslands

Two former sheep pastures totalling approximately 10 acres are maintained for upland species by spot mowing when necessary. None of the fields were mowed this year.

## 6. Other Habitats

There are approximately 38 acres of blueberry grounds on the Point. They are important to migrating songbirds, raptors, whimbrels ("blueberry curlews"), deer, and as singing grounds for woodcock.

The arctic-like tip of Petit Manan Point with its shrub-slope peatlands and raised peatlands contain fragile, unique ecosystems that will not be actively managed.

Unusual plants on the refuge include: beachhead iris, Iris hookeri; sea lungwort, Mertensia maritima; a snapdragon, Gerardia neoscotica; blinks, Montia lamprosperma; the endangered orchid, Malaxis brachypoda; and roseroot stonecrop, Sedum rosea. Two unique plants were discovered during 1991. Volunteer Widrig

discovered Botrychium lunaria, a rare species of moonwort, on Petit Manan Point. This is only the second site located in Maine for this plant. Susan Gawler, a botanist for the Maine Critical Areas Program, found an endangered reed grass, Calamagrostis pickeringii, near Big Pond. This too was the second known location in the State for this plant.

## 7. Grazing

One half of Nash Island is privately owned and is used for sheep pasture. The fence that separated the former lightstation property from the private property has long since been torn down, giving the sheep the run of the island. Replacing the fencing above high tide would make the island a good test site for research on the effects of sheep on the coastal islands.

A small portion of sheep pasture on Metinic Island was isolated with electric fence on 21 November. Megyesi, Benedict, Schubel (NAS), and Schick did the installation on a grey, windy day which made getting to the island a chore. The plot will be monitored over the next season to observe changes in vegetation and related changes in nesting behavior by the local tern population.

## 9. Fire Management

**Blueberry Fields:** On May 3, refuge staff along with the assistance of FMO Vollick and seasonal fire crew burned the Powerline and Homestead fields on Petit Manan Point. This is part of the annual blueberry field maintenance program.

On June 22 the refuge received a fire trailer from Moosehorn NWR. Seasonal firecrew sanded and repainted the trailer during their stay.

November 17-19 Phil White mowed the Silver Mine Field (6.5 acres), camp Roads Field (1.6 acres), and the Lower Birch Point Field (6.5 acres). All are blueberry fields and will be targeted for burning next spring.

## 10. Pest Control

Former refuge manager Tom Goettel assisted RM Anderson with a presentation on tern restoration and the pesticide 1339 at the monthly Tremont town meeting, at the request of the town manager. This was an effort to educate the local people about our tern restoration efforts at Ship and Trumpet Islands in Blue Hill Bay.

Prior to the meeting a 1339 EA, manufacturers label, and LD50s for various animals had been provided. No opposition was voiced and the town manager was quite comfortable with our efforts.

3/22 Benedict traveled to Augusta to undergo a battery of testing to become a certified Master Pesticide Applicator for 1339. The state required written exams for Core Material, Category 7a (Structural & Rodent), Regulations Exam, and a two hour oral Master Exam. Many hours were spent during the month in preparation for the exams. Fortunately, the license is good for three years and is renewable with recertification credits.

See Section D.5. for a rundown on gull control activities at Ship and Trumpet Islands.

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

In 1991, the Maine Critical Areas Program proposed to designate the grassy point south of Big Pond as a Critical Area Station. This designation is desired to provide maximum protection for the very rare Moonwart Grape Fern population discovered by Volunteer Widrig.

Other sites on the Register of Critical Areas are-

- \* **Petit Manan Island, 1975, Significance for Tern Nesting.**
- \* **Petit Manan Point Marine Invertebrate Area, 1978.**
- \* **Petit Manan Point Rare Plant Station, 1985.**

## **G. WILDLIFE**

### **1. Wildlife Diversity**

Petit Manan Island is one of the two most diverse seabird nesting islands in the Gulf of Maine. Laughing Gulls are at the northern most part of their nesting range on Petit Manan, while Atlantic Puffins and Razorbill Auks are found on just three other islands to the south and two other islands to the north in the Gulf of Maine. The federally endangered Roseate Tern has its northern stronghold on Petit Manan Island, and Common and Arctic Terns are found on just a handful of other islands in the Gulf of Maine.

With the event of landfill closures and gull control efforts on Petit Manan and other seabird nesting islands, the impacts of larger predatory gulls have become manageable. The environmental education impact of these management programs should not be underestimated. Puffins are very popular birds and attract quite a bit of attention from the public, not just dedicated birders.



Terns are harder to restore to historic nesting areas, as trading one white bird for another (a Herring Gull for a Common Tern, for example) is a more difficult concept for most.

## **2. Endangered Species**

A total of 59 pairs of Roseate Terns nested on Petit Manan during 1994. No productivity studies were conducted, although no undue mortality in fledglings were noted. Six previously banded birds were identified with a KOWA spotting scope. Two of these were banded as chicks on Petit Manan Island; one was banded as a chick on Eastern Egg Rock, and the remaining three were banded in Massachusetts and New York colonies.

A Peregrine Falcon visited Petit Manan Island at least 45 times during the summer and was successful in capturing 6 adult terns. The Peregrine Falcon most likely nests on Cadillac Mountain at Acadia National Park. Park personnel and refuge personnel have attempted to track falcon activities from the time a bird is observed leaving the nest to when a bird is observed on the island. Unfortunately, the falcon visits occur sporadically throughout the day and are not always documented. The falcon's visits, although disruptive to the colony, do not appear to have long-term effects on tern productivity to date.

Bald Eagles are often observed on nearby Green Island. These birds are either observed loafing or circling Green Island; no predation has been observed.

On June 16 Schick and Megyesi assisted Angela Matts of Maine IF&W in banding the eaglets at West Douglas Island. The pair produced triplets this year with two of the young identified as females and a third too small to make a certain determination. The smaller eaglet was thought to have hatched at least two weeks later than the first. All appeared to be in good health. On June 16-17 Schick and Megyesi conducted the annual tern surveys from Tibbet Narrows to Schoodic and found the same results as previous years - no new tern nesting. They observed three terns feeding off Flint Island.





Angela Matts, Maine Inland Fisheries and Wildlife, bands a set of triplets produced by the West Douglas Island's eagle pair. JM

### 3. Waterfowl

During the 1994 gull nest count on Green Island, over 900 Common Eider nests were counted. This is probably an underestimate, as some of the area was so densely packed with nesting hens that they were avoided. Few eiders nest on Petit Manan, perhaps the result of increased human disturbance and unsuitable vegetation or competition for nesting space with Laughing Gulls.

A dead female eider, banded, had been recovered by M.Drennon on Ship Island, June 1993. According to MDIFW records the bird was banded on Ship, 5/31/83, as an adult, indicating it was a minimum of 12 years old exhibiting tremendous nest site fidelity.

Teal were noted mixed in with resident Black Ducks at Cranberry Marsh on 26 April. Six to eight Harlequin ducks were observed at Bear Cove periodically during the month.

In October, an estimated 2600 Black ducks and 800 green winged teal were using Cranberry Flowage.

## **5. Shorebirds, Gulls, Terns and Allied Species**

Double-crested Cormorants returned to Maine on April 24. Cormorants are common throughout the Gulf of Maine, though none nest on Petit Manan Island.

Great Cormorants are commonly observed in the winter, replacing the Double-crested Cormorants which are present throughout the spring, summer and fall. Great Cormorants nest in small numbers in Maine, though none nest on Petit Manan Island.

Sooty, Manx, and Greater Shearwaters, Common and Thick-billed Murres, Parasitic and Pomerine Jaegers, Dovekies, Black-legged Kittiwakes, Red and Northern Phalaropes, Wilson's Storm-petrels, Northern Gannets and Common and Red-throated Loons are occasionally observed offshore in fall, winter, and early spring.

Petit Manan staff completed the annual tern surveys from Schoodic Point to Cross Island June 16 and 17. No new tern nesting islands were found, but feeding terns were observed near Shipstern Island.

A wide variety of shorebirds use Petit Manan as a critical stopover that provides feeding and resting sites. Shorebirds begin arriving from their northern nesting grounds by mid-July with peak numbers in late August. Species commonly observed include Least and Semipalmated Sandpipers, Short-billed and Long-billed Dowitchers, Ruddy Turnstones, Sanderlings, Purple Sandpipers, Greater and Lesser Yellowlegs, Red Knots, White-rumped and Baird's Sandpipers, Semipalmated and Black-bellied Plovers, Whimbrels, Dunlin, Hudsonian Godwit, and Willets.

## **6. Raptors**

Each year, tens of thousands of raptors pass over Maine's coastal islands and peninsulas during the fall migration. This year's migration included flights of American Kestrels, Broadwing Hawk, Red-tailed Hawk, Merlin, Sharp-shinned Hawk, Peregrine Falcon, Cooper's Hawk, and Rough-legged Hawk. Two Snowy Owls were observed on the point during the winter of 1994.

Ospreys are common in the area, usually arriving in mid-April and leaving by mid-October.

Bald Eagles are common in the area as well; the pair of eagles

nesting on the middle Douglas Island, adjacent to Bois Bubert Island (part of Petit Manan NWR), raised three eaglets. Refuge staff David Schick and Jennifer Megyesi assisted Angela Matz from the University of Maine with banding the eaglets and with collecting measurements and feather blood samples for contaminants analysis.

## **7. Other Migratory Birds**

Nesting species of interest on the refuge include the Boreal Chickadee, Lincoln's Sparrow, White-winged Crossbills, Savannah Sparrows, and 14 species of warblers.

New bird specie observed this year on the refuge was Worm-eating Warbler.

Large flocks of Snow Buntings have been routinely seen in the vicinity of feeders on Petit Manan Point. While not rare to the Point, these birds are not common to feeders there, and their presence may be an indicator of the overall severity of this year's winter.

## **8. Game Mammals**

A cow Moose and her calf were observed at Meadowbrook Flowage. Several tracks were observed on the far end of the point. The White-tailed Deer population continues to flourish. Culling this herd has been discussed for the past two years but remains unresolved. The browse line is severe in some areas while limited in others. There were no winter killed carcasses found.

## **9. Marine Mammals**

An unidentified whale species washed ashore on Petit Manan Point on August 1, 1994. The refuge called in biologists from Allied Whale at the College of the Atlantic with the discovery. All three were baffled by the specimen, but thought it was some type of tropical dolphin species. The specimen was dissected and bagged and carted back to COA, where dermestid beetles will clean the skeleton. Specimen identification is expected sometime next summer.

Harbor seals and harbor porpoises are both frequently observed around the refuge units. Minke and Finback whales and Gray Seals are less commonly observed.

Aerial seal surveys by Gilbert, UMO, have indicated a statewide increase in seal numbers statewide, except in the vicinity of PMI. Increased activity/disturbance by periwinklers and sea urchin divers are a possible explanation. A survey on 2/2 noted 4 sea urchin diving boats anchored around PMI.

## **10. Other Resident Wildlife**

Spruce and Ruffed Grouse both nest on the refuge. Ravens are year-round residents on the mainland and are occasionally found nesting on islands. One particularly persistent pair of Ravens has attempted to nest on Petit Manan Island for the past five years. They have become increasingly clever, constructing a nest in the boathouse, on the main house, and in the half-finished outhouse. Unfortunately, last year's research crew did not get out to the island until later in June, and the Ravens had already hatched chicks. The three chicks were removed and given to Moosehorn NWR to raise. All three chicks perished.

Woodfrogs and Spring Peepers are abundant on the refuge. No comprehensive amphibian or reptile lists have been developed; however, a study plan is being developed to monitor these populations on the refuge.

On September 20 Schick noticed something unusual resting on the 31' workboat trailer. On closer inspection he found a beautifully camouflaged gray tree frog. This is the first recorded sighting in this area. The gray treefrog appears to be largely limited to central and southern Maine with few records in the north and east.

By Dec. 12 the Great Pond otter had left signs of routine patrols up through the flowages of Petit Manan Point. Trails leading to openings in the ice and over the surface of the flowages were evident at both Mague and Cranberry Marsh.

## **11. Fisheries Resources**

The impact of changes in the Maine fishing economy raises serious management concerns for Petit Manan NWR. Many fish, clams, lobster, and sea urchins have been over-harvested.

Petit Manan island was again visited by a number of fisherman collecting periwinkles (*Littorina* spp.), sea snails which are primarily exported for human consumption. Periwinklers usually remain below the high water mark, and when unaccompanied by dogs they appear to have minimal impact on the bird colony. These activities need to continue to be monitored for adverse impacts to colonies especially during foggy spells.



#### 14. Scientific Collections

Professor Robert Weibe of Franklin and Marshall College began a geologic study of Petit Manan Point on June 16. His investigation is focused on a layer of igneous rock that may be represented on Petit Manan Point and not found elsewhere on the coastline to the west.

#### 16. Marking and Banding

The following species were banded on Petit Manan NWR during 1994:

<u>Species</u>	<u>Age</u>		<u>Number Banded</u>
	L	AHY	
COTE	273	61	334
ARTE	47	27	74
ROST	28	1	29
BLGU	30	3	33
LAGU	114	7	121
ATPU	6	1	7
<u>Total Banded</u>	498	100	598

### H. PUBLIC USE

#### 1. General

It is difficult to get an accurate picture of the public use on the refuge when located in an off-refuge office. Generally, it is "nature-oriented", with hiking, birding, and cross-country skiing the most common uses of the refuge's two public trails. Clam digging is permitted, but hunting, camping, and trapping are not at this time. The past couple of years have brought a noticeable increase in the number of refuge visitors.

On June 2nd a traffic counter for Petit Manan Point was installed at the refuge entrance. Based on data gathered for the summer and fall months there appears to be approximately 10-15,000 visits made

to Petit Manan Point annually. Although this seems like a small number, many comments are received by refuge staff indicating that they enjoy the experience much more since the area is not overcrowded.

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

On May 12th Benedict assisted as a wildlife judge for the Downeast Envirothon held at Cobscook Bay State Park. The event was the culmination of a years work for high school students studying various environmental topics from soils to wildlife. High schools from around the state competed on a raw, rainy day. Despite conditions everyone seemed to enjoy the day.

On July 7, Eagle Hill Research Station conducted a class on sedges on Petit Manan Point. The class was conducted by Tony Reznichuk and consisted of 15 students.

## **4. Interpretive Foot Trails**

There are two foot trails on the Point, the three mile long Birch Point trail and the one mile long Shore trail. Both are popular with the visitors and require a minimum of annual maintenance.

## **5. Interpretive Tour Routes**

Northeast Whale and Seabird Cruises began offering boat tours from Bar Harbor to Petit Manan Island to see puffins/seabirds, June 1 through July 30th, on the passenger vessel "Seal", certified for forty people. The boat made daily visits throughout the season. The charter also provides whale watching trips to Mt. Desert Rock.

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

Colonial Nesting Seabird Island Etiquette brochure: In 1993, RM Anderson in partnership with the Gulf of Maine Project and Maine Inland Fisheries and Wildlife developed a leaflet to inform the general public on how to identify seabird nesting islands, periods of sensitivity, bird behavior, etc.. In April 1994, the leaflet was printed in small start up quantity. Leaflets were delivered to: SEAGRANT, Vinylhaven Land Trust, TNC, ME Audubon, Conservation Fund, Island Institute, Outward Bound, Moosehorn NWR, Sunkhaze Meadows NWR, Rachael Carson NWR, MDIFW, Towns of Camden, Rockland, Steuben, Milbridge, Knox County Treasury, and Acadia Sea Kayaking Club.

K-6 Colonial Nesting Seabird Curriculum: This package (curriculum and many creative props) was created by a student from College of

the Atlantic for the refuges use in local schools. It was field tested this year in Columbia Falls and Harrington Elementary Schools. The MDIFW, GOMP, and CHEWONKI Foundation reviewed the curriculum. Teachers and students are thoroughly enjoying this package. Excellent comments for improvement, age level capabilities, etc. are being maintained for incorporating in final package.



The new Colonial Nesting Seabird Curriculum was field tested at local schools this year and was a hit with students and teachers.

EE Video on Maine Coastal Islands: In February, Jeff Dobbs Productions contacted the refuge to see if there would be interest in producing a EE video on Maine Coastal Islands. 2/17 RM Anderson met with Dobbs to discuss the cost, timeframe, and partners. Dobbs put together the video at minimal cost, and Jack Parkins donated the narration. In April the draft was provided for review and minor revisions; photography is stunning. On July 20 Bing Miller of Dobbs Productions traveled to Petit Manan Island to capture additional footage for the Maine Islands Video. Additional footage was needed for eiders and Roseate terns.

Presentations: 5/7 The Second Annual Spring (EarthDay) Celebration was held at Harrington Elementary School. Refuge staff organized and arranged mammal mounts, exhibits from Maine Trappers

Association and COA, along with a Seabird Exhibit and Neotropical Migrant Exhibit; about 150 attended the event.

Special Places Video: On June 22 Schick escorted Bill Sillier and another cameraman to Petit Manan Island to video footage for a TV spot entitled "Special Places". The focus was gathering footage of eiders and Roseate terns.

#### 11. Wildlife Observation

Approximately 50 people landed on Petit Manan Island this year. The largest parties consisted of groups from Outward Bound, and the College of the Atlantic Champlain Society. At the end of the season a party of six high school students and one instructor spent two nights on the island as part of a course on seabird ecology. In addition there were trips by professional photographers, and a variety of private citizens who arrived by motorboat, yacht, and sea kayak. By far the largest group visiting the island for wildlife observation were the daily trips by the passenger vessel 'Seal'. An estimated 1500 people took this tourism boat from Bar Harbor to PMI. By far puffins are the greatest draw.

#### 13. Camping

Camping is generally not allowed on the refuge. However, it does occur, especially on the offshore islands. A new organization, the Maine Island Trail Association, an offshoot of the Island Institute, was formed several years ago to "legitimize" camping, confine it to certain areas, take care of these areas, and to promote stewardship of the islands. Fortunately at this point, camping is not a big problem on the islands. We agree with the principles of MIA, particularly because we can not patrol the islands as often as we should, and realize we need help monitoring use and instilling the importance of stewardship in their members.

Through a cooperative agreement with the Island Institute a primitive campsite on Bois Bubert Island has been designated for use. If eagles are nesting in the area, the site will either be changed or camping will not be allowed. MIA must keep the site clean and make annual reports to the refuge manager.

MIA use of Bois Bubert campsite totaled 38 individuals during the summer months. The sites were kept clean and no problems were reported during 1994.



## 17. Law Enforcement

A very able four wheel drive vehicle toured Petit Manan Point on the night of Jan. 30. The vehicle drove past two closed gates and traversed a number of refuge and private roads as far as the Great Pond, and even fifty yards into the shrub-scrub heath behind Bear Cove Beach. No break-ins were discovered at any of the private cottages on refuge inholdings, but several houses had been circumnavigated by the vehicle. Only two beercans, and tire-tracks were left to document the visit; Bill Mague stated that the vehicle had turned around in his dooryard twice, at midnight, and later around 1:30 AM, but he was unable to get a good look at the unwelcome visitor. The night was too cold to be good for poaching deer, but it is apparent that whoever made the visit knows the layout of the refuge pretty well, and would probably feel free to come again.

On May 10th, Benedict was called about a cormorant shooting at Hascom Construction company in Machias. Benedict visited the site and found one dead cormorant floating in the pond and then contacted the land owner. He expressed a problem during this time of year with cormorants flocking to his trout pond. He was directed to ADC for non-lethal deterrent suggestions or a depredation permit.

The Petit Manan Point Road was signed and closed on 27 October. Someone took his poaching seriously, however, and drove through the gate that evening. No serious damage was done to the already bent gate.

On October 29 and 30, Benedict staked out Petit Manan Point for potential night hunters anxious to shot a deer before the end of the season. Two cars were stopped and warned for being on the refuge after hours - neither had firearms.

11/25 Benedict staked out Petit Manan Point for possible night poaching activity. Four cars were stopped and verbally warned about being on the refuge after sunset.

Machias Seal Island: Machias Seal Island, a seabird nesting island, continues to be a subject of sovereignty dispute between the United States and Canada. In 1944, Canada designated the area as a Migratory Bird Sanctuary pursuant to the Canadian Migratory Bird Convention Act. This island is one of the few areas in North America where bird enthusiasts may actually visit a colonial nesting seabird site and visitor demand has increased substantially in recent years. The CWS currently issues permits to charter boat captains and limits visitation from June 1 - July 31 to 30 persons/day. From 1987 to present this permitting has proceeded without incident. Recently, however, additional American boat captains have expressed an interest in bringing visitors to the island, prompting a request from CWS for FWS management assistance.

FWS would have regulating authority under the Migratory Bird Treaty Act.

Final schedules regarding landings for summer 1994 were forwarded on to captains. March 9th received fax regarding a potential lawsuit being filed by Captain Patterson regarding unfair treatment in the distribution of landings - he feels that FWS only has authority to distribute landings equally among all captains not to base it upon historical landings. Benedict kept Mullen and SRA Stott appraised of developments.

In June and July no visits were made by FWS staff to Machias Seal Island for compliance checks. LE staff and Coast Guard personnel are still wary about moving forward until something more formal comes down in regard to regulatory authority and sovereignty.

## I. EQUIPMENT AND FACILITIES

### 1. New Construction

Boat Storage Building: In August, at the request of CGS, Schick developed a floor plan and specifications to be used in formulating the bid package for the boat storage facility. On Sept. 21 Schick and Benedict met with Landlord Perry to discuss the new storage building construction at the Petit Manan office. The group staked out dimensions for the new building and met with an architect. The architect produced drawings and sent a copy for comment to the refuge and Perry. The office landlord finally received the bid package in October for the new storage area and is soliciting a design and bids on the facility.

A number of local contractors were contacted to solicit rough estimates for the construction of a new storage building. This was undertaken as a favor to the facilities landlord, who is located out of state and was having difficulty getting the information he needed in order to submit a bid to GSA. Refuge staff felt strongly that the station's need for more space justified the expenditure of effort on what should normally be the landlord's task.

### 2. Rehabilitation

Petit Manan Island Boathouse: Draft Plans were forwarded by Reg.5 RW to the Advisory Council on Historic Preservation for review and comment in January. Funds were shifted from one project, pave parking lot - \$10,000, to the PMI boathouse reconstruction project. This gave the project a construction budget of \$20,000; and an estimated materials budget of \$11,000.

R.O. staff Otting, Wilson, and Kanaski visited Petit Manan Island on May 11th to inspect the boathouse site. During their visit they did a small test dig for archeological artifacts behind the existing foundation and took various measurements to aide in drawing up the final blueprints for going out to bid.

During July builders were contacted by refuge staff to develop a contractors list for forwarding final bid packages. Due to the lateness of the season many had already booked themselves for the duration of good weather. Another problem was the need to have a bonded builder despite the small cost of the project. Few locals have bonding and those that do are involved in much bigger jobs. Five contractors were submitted as possible contacts.

During August and September, three contractors were escorted to Petit Manan Island to look over the construction site to produce a bid on the boathouse reconstruction. Kurt Otting and Dale Aubin RO were also along to answer bid package questions.

In October, after discussions with the refuge and the contracting officer, the contractor, Ray Day Builders decided to postpone starting work until the spring of 1995.

Meadowbrook Water Control Structure Rehab: On Sept. 27, Duncan Creaser (RO Engineering) visited Meadowbrook and other flowages on Petit Manan Point in order to provide a cost estimate and direction on how to proceed with the third attempt at producing a workable design at Meadowbrook.

32' Workboat: A major effort was initiated to get the dormant 32' workboat ready for the sea. On November 2, John and Freddy Luke of North Atlantic Industries surveyed the vessel in order to write an estimate for further corrective work on the vessel. Their estimates for work identified by the refuge as either necessary or desirable totaled \$8,852. They also suggested, with strong concurrence by refuge staff, that the vessel be surveyed by a qualified marine surveyor. Schick devoted a total of 121 hours of labor working on getting the boat ready for launching. The vessel was launched for sea trials on 17 November but proceeded no further than the pier due to an overtightened seawater intake fitting (this probably occurred at the end of the vessels construction). The fitting was leaking, and because it was in-line between the hull and the seacock, it created a situation which precluded stopping the leak without removing the fitting. Because of this fact, and in light of the fact that the engine intake had been plumbed in the same way, the boat was rehailed. Temporary stainless fittings were ordered from Boston on the 18th, but had not arrived by the end of the month. Plans have been made to reengineer both the seawater and engine intake systems this winter. Winter weather conditions prevented the boat from being relaunched this year.



The M.V. Sow was transported to North Atlantic Industries in East Boothbay on 12 December in preparation for remedial repairs to the hull. Small Craft Operator Schick met with John Luke of N.A.I., and Jan Bihower, an independent marine surveyor with extensive experience with metal boat construction, in order to survey the vessel and develop a set of priorities for the repair process. A number of structural deficiencies were revealed by the survey, and a set of remedial repairs were suggested by the surveyor. The potential cost for all repairs and desired upgrades is approximately \$12,000; an estimated \$6500 worth of repairs were authorized to repair the vessel's skeg, rudder, hull framing, and engine beds. While it is some relief to have concrete, well defined information with which to supplement an intuitive mistrust of the vessel's construction, it is discouraging to realize that the situation is the result of a poorly done, low bid procurement process, and that it took three years to develop enough funding to be able to seriously address some of the vessels deficiencies. Hopefully, the station is now well on the way to having a useful piece of equipment; the process is far from over, however.



The ornery 32' work boat, 'M.V. Old Sow', launched and was hauled in the same day due to an overtightened water intake fitting. The saga of this CGS low bid contract continues.



Birch Point Parking Area Paving: Kurt Otting RO Engineering visited the refuge on November 17 to begin work on producing drawings for the paving of the Birch Point Parking Area identified under 504 for accessibility and funded this FY. The funding for this project was transferred to supplement the monies available for the Petit Manan boathouse reconstruction.



Cellular phone technology makes it harder to truly leave the office behind. JDM

## 5. Communication Systems

The office finally went on "touch-tone" telephone dialing in January. This is a great improvement in terms of both speed, and in ease of use with peripherals such as the fax machine and computer modem.

Telephone line 207-546-2017 was installed in the office on 25 February. This line was established as a dedicated line for Fax and E-Mail use but was given to the fisheries personnel upon their arrival.

Telephone line 207-546-3054 was installed on 2 March as an additional refuge line after several complaints were received about how often the phone was busy.

## 6. Computer Systems

The refuge received an excess ACMA 486 50 mhz microcomputer from the Region 5 RO on 16 February. The machine will be used by the refuge biologist and is currently housed in her office at the RO in Hadley.

Acquired a Gateway P5-90 computer - \$4,352 on November 14 through the wish list process.

On November 18th office computers were swapped to make use of the new pentium and maximize the use of our existing machines. Rivers Edge Computer installed the computer network Lantastic 6.0. in December. The network was still undergoing debugging by months end.

## 8. Other

Joe Williams RO visited the refuge on May 4th to conduct a maintenance management evaluation. During his stay we took a trip to Petit Manan Island and Petit Manan Point to review the boardwalk project, Petit Manan Island boathouse, Cranberry Dike, Meadowbrook and Mague.

## J. OTHER ITEMS

### 3. Items of Interest

Machias Seal Island: Machias Seal Island, a seabird nesting island, continues to be a subject of sovereignty dispute between the United States and Canada. In 1944, Canada designated the area as a Migratory Bird Sanctuary pursuant to the Canadian Migratory Bird Convention Act. This island is one of the few areas in North America where bird enthusiasts may actually visit a colonial nesting seabird site and visitor demand has increased substantially in recent years. The CWS currently issues permits to charter boat captains and limits visitation from June 1 - July 31 to 30 persons/day. From 1987 to present this permitting has proceeded without incident. Recently, however, additional American boat captains have expressed an interest in bringing visitors to the island, prompting a request from CWS for FWS management assistance. FWS would have regulating authority under the Migratory Bird Treaty Act.

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lawsuit being filed by Captain Patterson regarding unfair treatment in the distribution of landings - he feels that FWS only has authority to distribute landings equally among all captains not to base it upon historical landings. Benedict kept Mullen and SRA Stott appraised of developments.

In June and July no visits were made by FWS staff to Machias Seal Island for compliance checks. LE staff and Coast Guard personnel are still wary about moving forward until something more formal comes down in regard to regulatory authority and sovereignty.

Aquaculture: A valiant effort was made by refuge staff, G.Beckett and W.Rosier, ES, and C.Melberg, RO-RE, to reason with the COE and ensure that they maintain a 1/4 mile buffer from MLW on the proposed Little Libby Island aquaculture site. The COE in spite of verbally hearing from the USCG/FWS that negotiations were ongoing for inclusion of this island into the NWR system, demanded written proof; 4/19 the COE issued a permit to Atlantic Salmon Inc.

6/30 A meeting was held by Maine Department of Inland Fisheries and Wildlife to discuss aquaculture and the proposed rule for seabird nesting islands which would include language providing a buffer around state owned islands.

7/19 P. Conkling, Island Institute, facilitated a meeting between Department of Marine Resources, Libby Butler (Atlantic Salmon Inc. lawyer), Mike Hastings (ME Aquaculture rep), J.Clements (COE) and FWS - Anderson, Megyesi, Haas, Goettel, Rosier. This was the first time such a mixture of diverse interests had sat around the table without an 11th hour issue over an aquaculture permit. Although not exactly a friendly meeting it was a beginning to try to gain a better understanding of each others interests and concerns.

Maine Refuges on Radio: On July 21 RM Mullen of Moosehorn NWR and Benedict participated in a 1 hour radio show on WZON in Bangor owned by the writer Stephen King. The program was a call in show focusing on outdoor sporting opportunities with a focus on Maine refuges. Don Carrigan, the host, covered a broad range of topics from recreational opportunities available on Maine refuges to Atlantic salmon listing. Despite lively topics no call ins were generated.

Helicopter Lift: In exchange for some helicopter time, the refuge facilitated an airlift for International Chimney Corp. on 18 October. The company is doing some work for the USCG, reinforcing the external bracing of the tower on Petit Manan Island. The company was allowed to stage a helicopter lift in the lower hayfield on Petit Manan Point, thus significantly reducing transit time for their materials. Unfortunately, the Bell 47 helicopter used for the lift was too small to be of much use to the refuge; but we did manage to get a small, non-functioning refrigerator off the island.

Refuge Revenue Sharing: Refuge revenue sharing checks were all hand delivered to the towns of Camden, Cutler, Addison, Steuben, Milbridge, Friendship, Phippsburg, and Knox County. 1993 appraised values coupled with a reduction in the percent of payment (FY 93 77.9% vs. FY 92 81.1%) resulted in drops in payment for the towns of Steuben and Addison. Below is a summary of FY 93 payments.

Cutler	\$27,158
Addison	469
Steuben	24,371
Milbridge	22,110
Camden	44
Knox	1,460
Friendship	847
Phippsburg	701

#### 4. Credits

Megyesi - D.5. and G all sections.

Schick - provided valuable input to section B. and I.

Kimmel - E.5.

Benedict - all others.

Photo credits: JG - Jim Goldsberry  
 JM - Jennifer Megyesi  
 BB - Brian Benedict  
 MB - Myer Bornstein  
 AM - Anna Megyesi  
 MA - Margaret Anderson  
 JDM - Jeff Desmond-Miller





Sunset on Ship Island

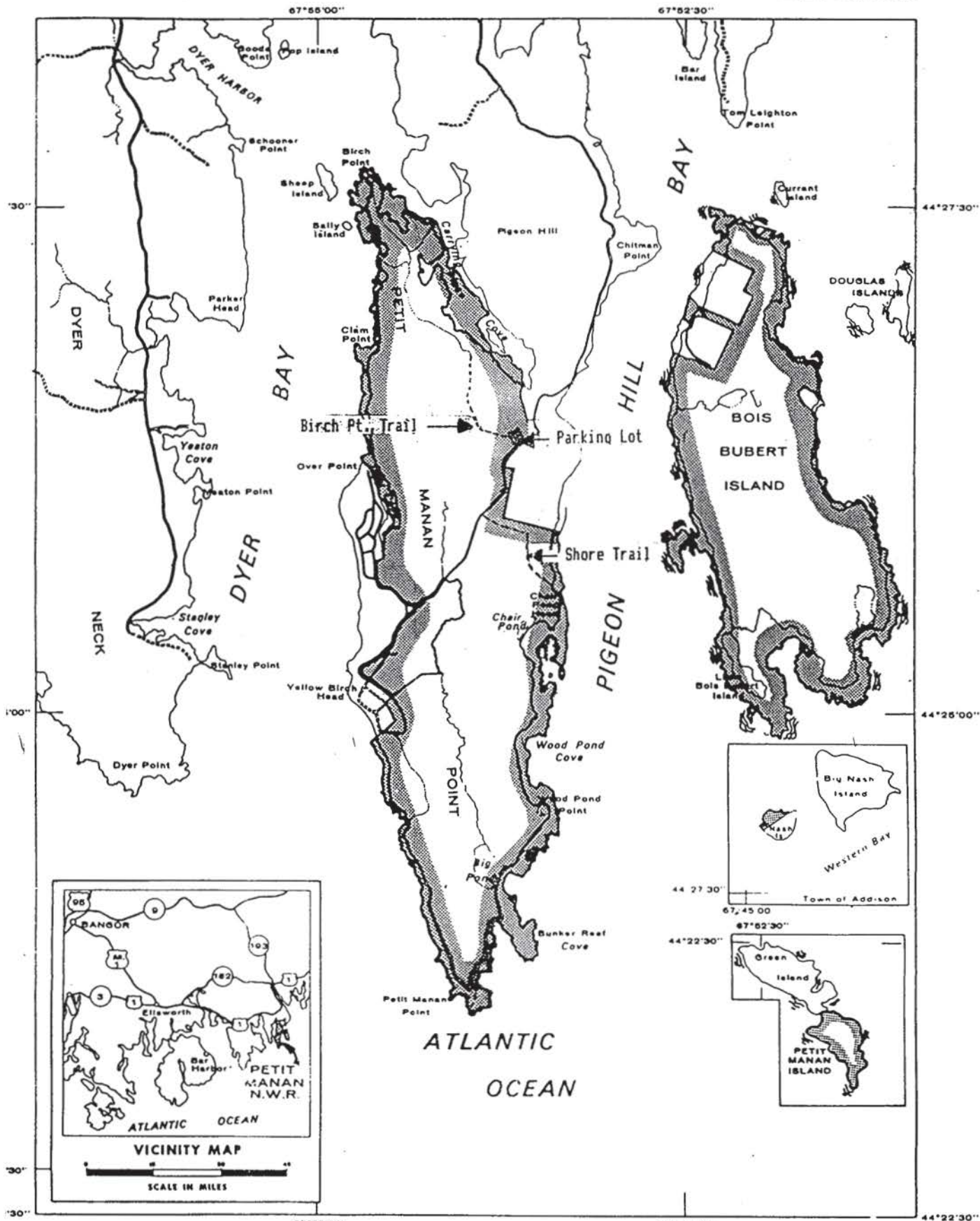
JDM

# PETIT MANAN NATIONAL WILDLIFE REFUGE

UNITED STATES  
DEPARTMENT OF THE INTERIOR

WASHINGTON COUNTY, MAINE

UNITED STATES  
FISH AND WILDLIFE SERVICE



COMPILED IN THE DIVISION OF REALTY  
FROM SURVEYS BY U.S.

SCALE 0 2000 4000 6000 8000 FEET  
1 5 0 1 KILOMETER

BOSTON, MASSACHUSETTS JULY 1974

10°  
Magnetic  
True North

MEAN  
DECLINATION  
1948

CROSS ISLAND NATIONAL WILDLIFE REFUGE

Cutler, Maine

ANNUAL NARRATIVE REPORT

Calendar Year 1994



Cross Island's bold shoreline.

TG

### INTRODUCTION

Cross Island National Wildlife Refuge is a 1,703 acre island complex donated to the Fish and Wildlife Service in 1980 by Thomas and Virginia Cabot through The Nature Conservancy. Located in the town of Cutler, Washington County, Maine, the complex is composed of six islands: Cross Island, 1,654 acres; Scotch Island, 10 acres; Outer Double Head Shot, 14 acres; Inner Double Head Shot Island, eight acres; Mink Island, 11 acres; and Old Man Island, six acres.

The refuge was authorized under 16 U.S.C. 715 d., Migratory Bird Conservation Act for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.

Twenty acres on Cross were retained by the Cabot family for their noncommercial use, with the Service retaining first rights of refusal should they decide to sell. Nineteen acres are owned by Hurricane Island Outward Bound, Inc., an environmental education/survival/confidence building organization. It owns and maintains the former Coast Guard station, now known as the Cabot Biological Station.

Like many of the islands on the Maine coast, Cross has a long history of human habitation. Known by the Indians as Sebohegonet, it was used as a fishing base by both Indians and early mariners through the 19th century. In the latter half of the 19th century it had several saltwater farms and even a small village with a school and store. There were copper mines near Seal Cove and on Outer Double Head Shot, although virtually no evidence of this remains today.

The U.S. Lifesaving Service built a station on Cross in 1874, which became a Coast Guard station in 1928. The Coast Guard soon abandoned the old lifesaving station, and built a new station at Northeast Harbor in the 1930's. The island was owned by a paper company that clearcut it between 1939 and 1941. It was then purchased by a businessman who hoped to turn it into a hunting preserve. After World War II began, expecting little business, he sold it to the Cabots, and it became



Cross, Mink and Scotch Islands are forested with dense stands of red and white spruce, balsam fir, yellow and paper birch, and red maple. The shoreline is generally rocky, with some cliffs over 100 feet high on the southern shore of Cross. The maximum elevation is 160 feet.

The Double Head Shots and Old Man are valuable colonial seabird nesting islands, vegetated largely by grasses and forbs with some white spruce. Old Man Island is one of only four nesting sites for razorbills in the Gulf of Maine. At the turn of the century, Old Man was the site of the sole surviving common eider colony in Maine, the rest having fallen victim to egg, feather, and meat market hunting.

#### B. CLIMATIC CONDITIONS

The climate of coastal Washington County is moderated by the Atlantic Ocean. Summer temperatures are significantly cooler and winter temperatures are significantly milder than inland areas. In the Machias area the average annual temperature is 43 degrees F., average annual precipitation is 45 inches, average annual snowfall is 75 inches, and average growing season is 132 days. The cold Labrador current has an important influence on Cross Island, helping make one out of every three days foggy during the summer months. The average tidal range is 13 feet; spring tides reach 15 feet. The area receives an average of 14 thunderstorms per year.

#### D. PLANNING

##### 4. Compliance with Environmental and Cultural Resource Mandates

The Cross Island Lifesaving Station has been a serious fire and visitor safety hazard for some years. The Maine Historic Preservation Commission determined that this building was ineligible for inclusion to the National Register of Historic Places on 24 July 1989. However, The Maine Maritime Museum, Bath, ME expressed an interest in salvaging all or part of the building

in 1991 but a meeting never transpired. The building is scheduled for burning next field season.

#### E. ADMINISTRATION

##### 1. Personnel

The refuge is administered and funded out of the Petit Manan office in Milbridge.

##### 2. Volunteer Programs

Hurricane Outward Bound participants again provided beach cleanup and trail maintenance, resulting in about 800 student use-days and 450 hours of service project time.

#### F. HABITAT MANAGEMENT

##### 1. General

At the present there is no active habitat management on the Cross Island complex. Our emphasis is on habitat preservation and protection for bald eagles and colonial seabirds.

##### 2. Wetlands

Approximately 240 acres on Cross is classified as wetland, most of which is forested or shrub-wetland, created by poorly drained soils in low-lying depressions or seeps. Dense thickets of alders have grown up along streams and drainages.

There are two significant saltmarshes, one at Northeast Harbor, and the other between Northwest Head and Cross. When covered by the tide, they provide good black duck feeding habitat; when exposed, they provide good shorebird feeding habitat.

### 3. Forests

Most of Cross is boreal forest, dominated by second growth red and white spruce, with some balsam fir and mixed hardwoods such as yellow and paper birch and red maple as subdominants. Cross was last commercially logged between 1939 and 1941; old logging roads can still be seen throughout the island.

The biggest threat to the forests on Cross today is acid precipitation and fog. The average pH of fog on the Maine coast is 3.8; of rain, 4.3. Once the acidic water is in the soil, the granitic bedrock of this area provides little natural buffering.

A very heavy fuel load throughout most of the island poses some threat from fire, usually coastal conditions provide a damp environment.

Both Mink and Scotch Islands are forested like Cross.

### 4. Grasslands

Grassy Point is an unusual sand and gravel barrier beach called a Tombolo Bar. It is vegetated with a variety of seaside grasses and forbs such as oysterleaf and beachhead iris.

On the edges of Cross' southern cliffs are interesting meadow communities of grasses, blueberries, black crowberry, cranberry, and stunted spruce, over a thick peat layer. Establishment and maintenance of these seaside meadows is not well understood.

### 5. Other Habitats

Other interesting habitats include the cobble beaches, dominated by salt-adapted species such as beachpea, sea rocket, and oysterleaf, and the cliff faces, which are dominated by roseroot stonecrop, black crowberry, and a variety of lichens.

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A sea cave, accessible only at low tide, can be found on the southern shore. Several sea anemones inhabit the cave.

The Double Head Shots are noted for their raspberry thickets that provide good eider nesting habitat.

Old Man Island is treeless, although old stumps and snags remain from years past. It is thickly vegetated with a variety of grasses and forbs such as cow parsnip.

## 12. Wilderness and Special Areas

Cross Island was listed on the State Register of Critical Areas in November 1989 for the unique value of a 5 acre stand of old-growth yellow birch. The stand is located on a west facing slope of the southwest point of Cross Island.

## G. WILDLIFE

### 2. Endangered and Threatened Species

The Machias Bay area is an important area throughout the year for bald eagles. Both Mink Island and Northwest Head are noted as popular eagle loafing and hunting areas. A historical nest exists on Mink Island, and active nesting has occurred on both Cross or Double Head Shot Islands since the 1980's.

The Cross Island eagle nest (State idn. 121A) was first observed in 1981. The State of Maine conducts aerial surveys of eagle nest, censusing in early spring to determine activity and again later in the summer for hatching success. This year one eaglet was produced, unfortunately, the nest fell sometime in late summer. It was assumed the eaglet did not survive. The following is a summary of bald eagle nesting activity for this area, provided by Charles Todd, State Endangered Species Biologist.

### BALD EAGLE NESTING AREA #121 HISTORIES OF SITE STATUS, NESTING & PRODUCTION



<u>Year</u>	<u>Cross Island (#121A)</u>	<u>Double Head Shot (#121B)</u>
1991	Tree/nest intact ** Active Eaglets: 1 observed, 0 fledged	Nest not found
1992	Tree/nest intact Active Eaglets: 1	"
1993	Tree/nest intact Active Eaglets: 1	"
1994	Tree/nest intact Active Eaglets: ?	"

\*\* Nest tree damaged/nest fell during the interval between surveys in the course of the breeding season.

### 3. Waterfowl

The saltmarshes of Cross are locally important black duck staging areas. Approximately 200 common eiders nest on the Double Head Shots and Old Man Islands. Other species observed include: Canada goose, black duck, green-winged teal, blue-winged teal, bufflehead, common goldeneye, red-breasted merganser, oldsquaw, common eider and white-winged and surf scoters.

### 5. Shorebirds, Gulls, Terns, and Allied Species

Nesting seabirds on the complex include 200 pairs of black guillemots, 270 pairs of double-crested cormorants, several hundred pairs of herring and great black-backed gulls, and 140 pairs of razorbills.

Old Man Island is one of only four nesting sites for razorbills in

the Gulf of Maine. The entire nesting population in the Gulf is less than 200 pairs, making it the rarest nesting seabird in the continental United States.

Bonapart's, ringbill, and Iceland gulls continue to be frequent visitors to the salmon pens.

#### 7. Other Migratory Birds

These islands are also important migrating and nesting areas to many neotropical migrants. Norm Famous intends to initiate a research project focusing on this topic in 1993. (See Petit Manan NR94 - D.5.)

#### 8. Game Mammals

Deer and moose are frequent residents of the island.

#### 9. Marine Mammals

Harbor porpoise, harbor seals, grey seals, and Minke whales have all been observed in the Cross Island Complex waters. Harbor seals are year round residents. Hundreds of harbor seals can be seen sunning in the Cross Island Narrow ledges.

#### 11. Fisheries Resources

Atlantic Salmon (Maine), Inc., was granted a lease for up to 96 pens on 25 acres just north of Northwest Head. The pens were installed in the winter of 1989-1990 and were fully operational in 1991. Each pen can hold between 5,000 and 10,000 seven to ten pound fish. A Section 10 permit is required from the U.S. Army Corp of Engineers and the State. Originally they had requested a site much closer to the island, but agreed to put the pens a ¼ mile offshore to minimize disturbance to nesting and loafing bald eagles. The permittee is also required to monitor water quality around and under the pens. Water test results are submitted to the Bangor Ecological Services office.

## H. PUBLIC USE

### 1. General

In 1968 Thomas Cabot gave 19 acres of Cross Island, including the former Coast Guard Station, to Hurricane Island Outward Bound, an environmental education/ survival/ confidence building organization. Since 1983 the former Coast Guard headquarters has been known as the Cabot Biological Station, run by the Island Institute, an offshoot of Outward Bound. It has been their Downeast base of operations since that time.

They currently use Cross for environmental education programs and overnight solo camping. A cooperative agreement formalizing our relationship was approved 31 May 1990 by the Regional Director and President of HIOBS. The Agreement designates what areas of the refuge can be used and when, sets a maximum number of student use-days, and requires that each student spend a minimum of two hours on service projects.

Other use of the refuge is by occasional picnickers, fishermen, kayakers, day-use by boaters, and hunters.

The three seabird nesting islands are closed to all public use during the nesting season, April 1 through July 31.

### 8. Hunting

Cross Island has been closed to all hunting by state law for many years at the request of the previous owners. However, the law has never been enforced, and deer and waterfowl hunting is common. The lack of staff in the area makes meaningful law enforcement difficult.

### 11. Other Wildlife Oriented Recreation

The appeal of colonial nesting seabirds such as razorbills, guillemots and puffins is not going unnoticed by enterprising commercial boat operators. Bold Coast Charter Company, Cutler,

advertises trips to Cross Island NWR. Most of his clientele are birders. With the limitations of number of visits and visitors to Machias Seal Island strictly enforced islands like Old Man, Petit Manan and Seal will see increasing pressures placed upon them.

### 3. Other

Demolition of the decrepit 1874 Lifesaving Station has been cleared by the Maine Historic Preservation Officer. Funding is needed to take it and the lookout tower down. Both are serious visitor safety hazards.

## J. OTHER ITEMS

### 3. Items of Interest

A revenue sharing check for \$27,158 was presented to the town of Cutler this year as compared to \$16,535 last year.

### 4. Credits      BB: All Sections.

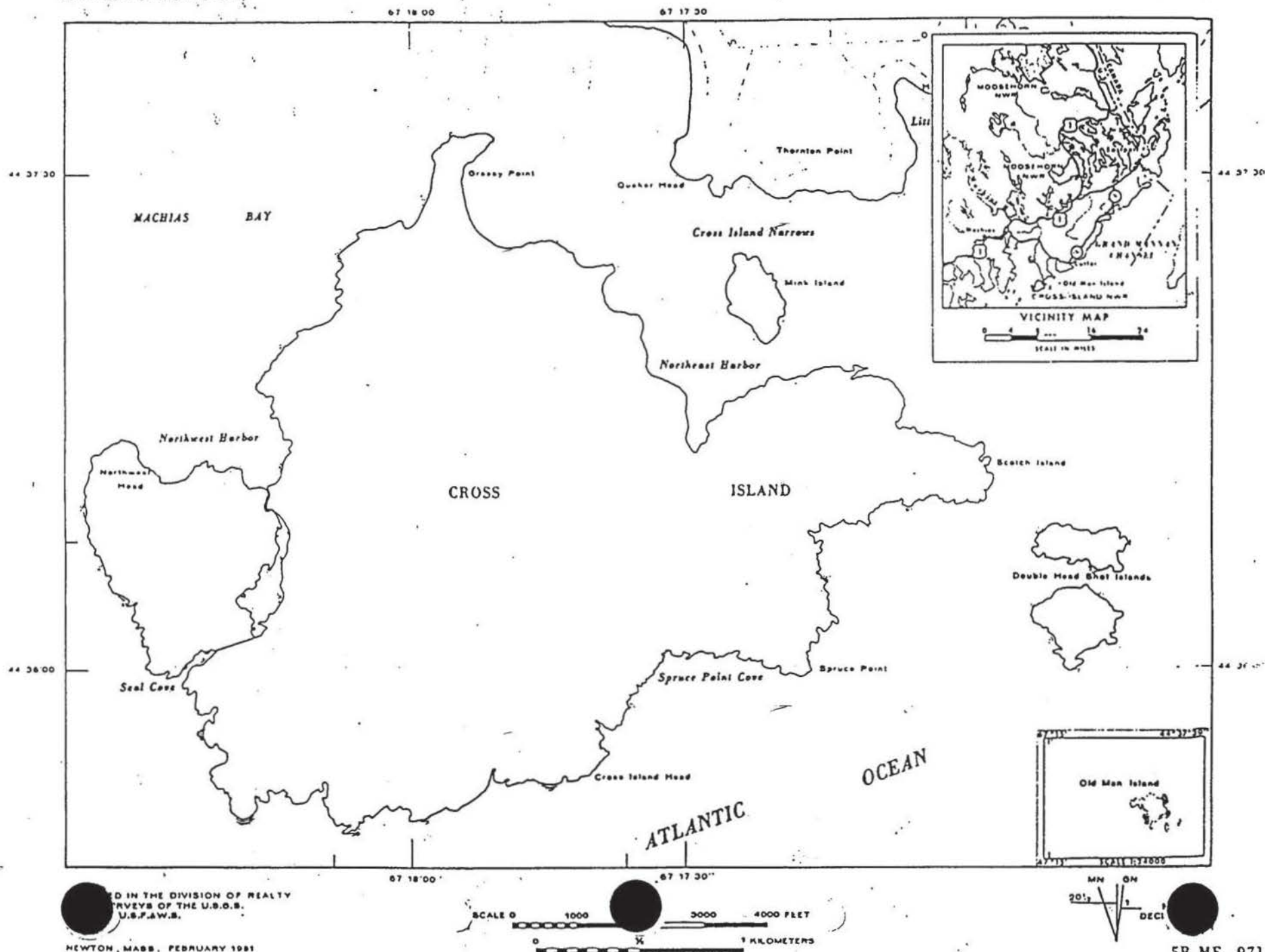


# CROSS ISLAND NATIONAL WILDLIFE REFUGE

UNITED STATES  
DEPARTMENT OF THE INTERIOR

WASHINGTON COUNTY, MAINE

UNITED STATES  
FISH AND WILDLIFE SERVICE



SEAL ISLAND NATIONAL WILDLIFE REFUGE  
Matinicus Isle Plantation, Maine

ANNUAL NARRATIVE REPORT  
Calendar Year 1994



## INTRODUCTION

Seal Island National Wildlife Refuge is a remote, relatively inaccessible 65 acre island located 21 miles south of Rockland, Knox County, Maine, in the plantation of Matinicus Isle. It is a treeless, rocky island composed of igneous rock, chiefly granite and gabbro with a maximum elevation of 65 feet. It served as a bombing and shelling target from World War II until 1952. It was transferred to the Service from the Navy in 1972. Transfer was authorized under 16 U.S.C. 667b-d, an Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes. The purpose of the refuge as stated in the National Wildlife Refuge System Draft EIS (7 Dec 89), Appendix B, is "... of particular value in carrying out the national migratory bird management program."

Seal Island was once the site of the largest Atlantic puffin colony in the Gulf of Maine. For over 200 years it was a summer campsite for fishermen harvesting herring, groundfish, and lobster. The fishermen also used their nets to harvest the nesting seabirds for meat, eggs, and feathers, which eventually lead to the demise of the colonies by 1887. An old dug well, mooring chains, tarred rocks where the fishermen tarred their nets, and an occasional bottle or piece of iron are all the evidence that remains of this era.

Seal Island was recolonized by herring and great black-backed gulls, common eiders, double-crested cormorants, and arctic terns during the first half of this century but was never recolonized by puffins. The more adaptable and mobile terns nested on the island until 1953, but were crowded off by gulls, a typical scenario repeated on many islands in New England.

In spite of the Navy bombing exercises, the island still supports some of the best colonial seabird nesting habitat in the Gulf - ie. boulder fields for puffins, razorbills, and black guillemots, grass/ledge areas for terns, raspberry and grass thickets for eiders, and peat/glacial till substrate for Leach's storm-petrels. In 1984 the National Audubon Society in cooperation with the USFWS and the Canadian Wildlife Service began a puffin and tern restoration project on this island.

Matinicus Rock, owned by the U.S. Coast Guard for over 155 years, is a 27 acre island with a maximum elevation of 35 feet. It is located 25 miles south of Rockland and is similar to Seal in that it too is treeless and rocky. Although not a component of Seal Island Refuge, it has been posted as a wildlife sanctuary by the Service since 1966 under a cooperative agreement with the U.S. Coast Guard. It is the site of the historic Matinicus Rock Light Station which was staffed by the USCG until automation in 1984.

Matinicus Rock was one of two islands in the Gulf of Maine where a relict breeding population of puffins, 1-2 pairs observed in 1902, survived the market hunting. Survival of the puffin and tern colonies is probably due to a long history of gull control initiated by the lighthouse keepers. In 1939 the National Audubon Society established a field station on Matinicus Rock to protect these colonies and has been a presence ever since. The island supports healthy colonies of arctic terns, Leach's storm petrels, black guillemots and puffins. Common eiders, common terns, razorbill auks and gulls also nest on the island.

Seal Island and Matinicus Rock are two of the most important colonial seabird nesting islands in the Gulf of Maine. The surrounding waters are rich with an abundance of food resources these birds depend on. Both islands are also important stopovers for migrating songbirds, shorebirds and raptors.

#### A. HIGHLIGHTS

- \* National Audubon Society receives Outstanding Contribution Award for their years of volunteer support on Seal Island.
- \* Puffins continued to increase both in the number of individuals and the number of nests. See Section D.5.
- \* A Razorbill Auk attraction study was initiated on Seal in an attempt to reintroduce Razorbills to the island. See Section D.5.
- \* Great Cormorants nested on Seal Island for the first time in the history of the refuge (no records exist for when the island belonged to the Navy). See Section D.5.
- \* The Regional Director Ron Lamberston, his wife Bonnie, Deputy Regional Director Cathy Short, and her husband Hank toured Seal Island and National Audubon's ongoing program on 10 July.

#### B. CLIMATIC CONDITIONS

The climate of the Rockland area is moderated by the surrounding ocean. Temperatures are significantly cooler in the summer and warmer in the winter than nearby inland areas. The average annual temperature is 46 °F., precipitation is 47 inches, snowfall is 60 inches, and the annual growing season is 143 days. During the summer fog, an important influence on coastal ecosystems, occurs about 21% of the time. The average tidal range is nine feet.



## D. PLANNING

### 5. Research and Investigations

53534-01. Re-establishment of Atlantic Puffins (*Fratercula arctica*) and Arctic Terns (*Sterna paradisea*) on Seal Island, Penobscot Bay, Maine. Steve Kress, Principal Investigator, National Audubon Society (NAS), Canadian Wildlife Service, and Fish and Wildlife Service.

This was the eleventh year of the project. NAS researchers arrived on 10 May and except for 6 days in late May and 12 days in late August, the island was continuously occupied until 31 September.

#### Objectives:

- a. To re-establish Atlantic Puffins and Arctic Terns to historical nesting habitat on Seal Island.
- b. To examine features of growth, post-fledgling survival, and movements of puffin chicks transplanted from Newfoundland to Maine.
- c. To further refine and test management techniques for re-establishing nesting populations of Atlantic Puffins and Arctic Terns.
- d. To further establish the nesting population of Razorbill Auks in outer Penobscot Bay.

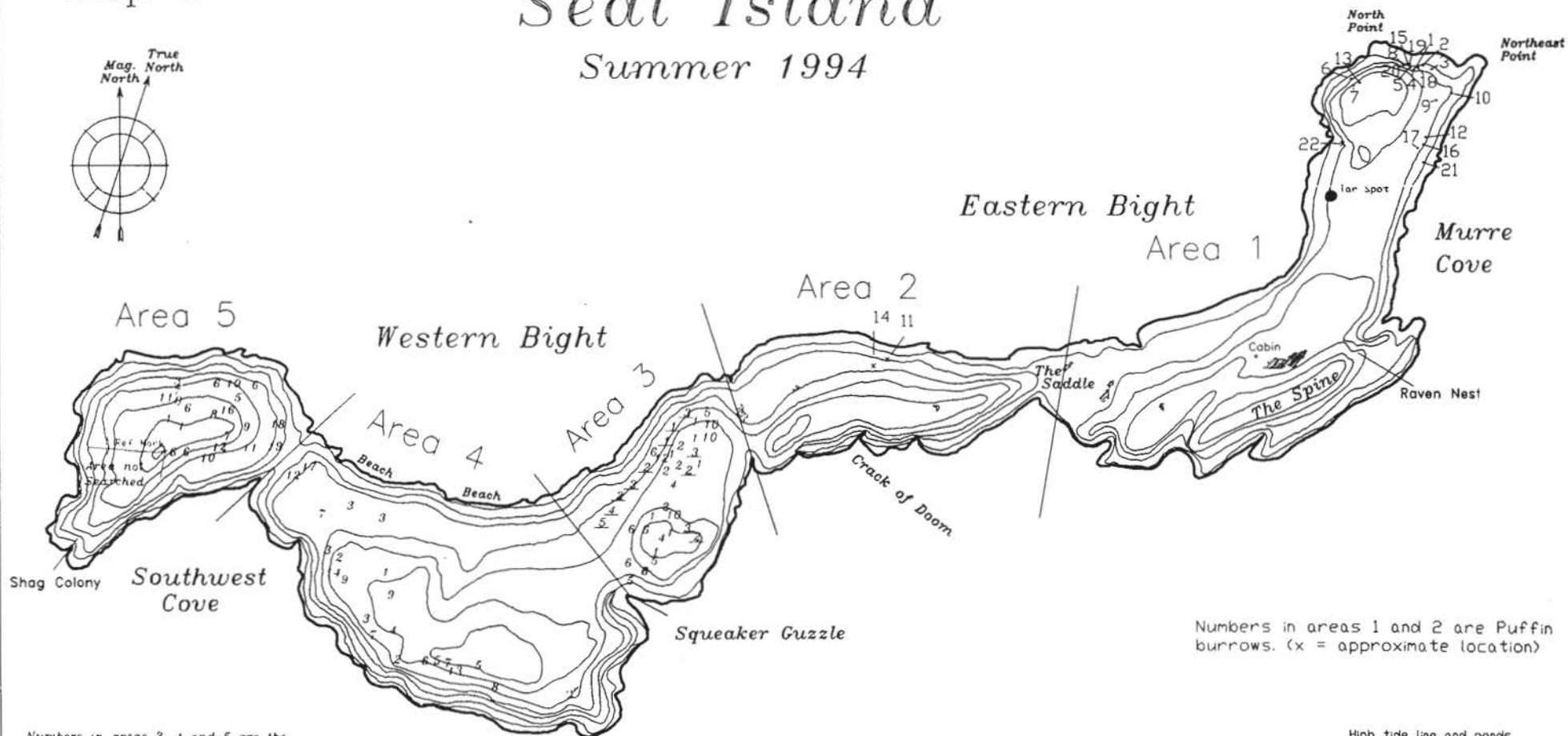
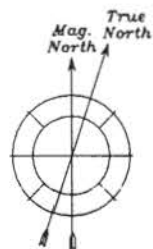
## PUFFINS

Between 1984 and 1989, 912 puffin chicks were transplanted from Great Island, Newfoundland, and hand-raised in sod burrows by NAS interns. They were banded with color and monel bands before they fledged. After fledgling, puffins go to sea where they spend their first two to three years before returning to land. They normally do not nest until they are four to five years old. Nesting occurs in rock burrows where a single egg is laid. Puffins are a very long lived bird, the oldest on record was 34 years of age. This was the third year that Atlantic puffins successfully bred on Seal Island this century, and the number of active nests continued to

Map 2

# Seal Island

Summer 1994



Numbers in areas 3, 4 and 5 are the number of Leach's Petrel burrows found at those locations by Ed Hearne et al.

Underlined numbers represent unmapped clusters, locations are approximate.

No nests were found in Area 2 and area 1 was not mapped this year.

Numbers in areas 1 and 2 are Puffin burrows. (x = approximate location)

High tide line and ponds digitized from ASCS aerial ortho photo.

Contours digitized from USGS 1:24,000 topo map.

Contour Interval 10'

RPS, seal24e, 11/1/94

rise from 7 in 1993 to 19 active nests in 1994, from which an estimated 16 chicks fledged.



Puffins once again increased in total numbers and nesting pairs. MB

The first native puffin chick was observed back on the island on 31 July. This chick was banded in 1992 and was therefore just one year old. It was later seen at nearby Matinicus Rock loafing with other puffins.

Sightings of banded puffins were primarily from Seal Island transplants, though birds from Matinicus Rock ( $N = 12$ ), Machias-Seal ( $N = 12$ ), and Eastern Egg Rock ( $N = 2$ ) were also observed; two native Matinicus Rock birds bred on Seal during 1993. The majority of puffins sighted, however, are unbanded (67.5% to 69.8% on three different observation days). Mean high count of adults was 20.3; the highest number of adults observed on the island was 35 on 19 July.

#### Razorbills

Razorbills are one of the rarest of the North American seabirds and are confined in range to the northern Atlantic Ocean. Although

40,000-60,000 are sometimes observed off of SW England, there are just four colonies in the Gulf of Maine (Machias-Seal Island, Old Man Island, Freeman Rock, and Matinicus Rock). Razorbills are often observed prospecting for nesting sites on Petit Manan Island, but they nest on just one island in the refuge system, Old Man Island (part of Cross Island NWR complex). Expanding the range of Razorbills to Seal Island NWR would decrease the potential for this species to be affected by catastrophic events and disease in the southern-most part of its range.

A Razorbill attraction study was conducted on the northeast point of Seal Island using wooden decoys and recorded Razorbill sound on Compact Disc. The decoys were set out on 14 May, and the sound system was activated on 17 May. A record number of Razorbills were observed on Seal this year, but not many of them were in the area of the decoys. Of 113 sightings of Razorbills between 9 June and 27 July, only 12 of them were in the area of the decoys. The highest number of individuals observed on the island was 12 on 14 June.

Many of the birds seen ashore this year seemed to be in pairs. They would sit together when loafing and would follow each other around the rock berm. It is possible that these are young birds from Matinicus Rock who are prospecting.

#### Black Guillemots

No counts or productivity studies were conducted on Black Guillemots during 1994. However, hundreds of guillemots nest on Seal, and fledgling chicks are observed at the end of the season around the island. A more substantial estimation of the guillemot population will be conducted in 1995.

#### Terns

Terns suffered significant predation from large gulls and had a poor food year on Seal. Although 963 nests were counted, which is up from last year's count of 915 (approximately 51% Arctic, 49% Common terns), reproductive success declined substantially. Arctic Terns fledged 1.04 chicks per nest (compared to 1.33 chicks per nest in 1993), while Common Terns fledged 0.79 chicks per nest (compared to 1.53 chicks per nest in 1993). Several chicks died after the 15 day fledging date, prompting the members Gulf of Maine Tern Working Group (GOMTWG) to re-evaluate their methods for estimating productivity in tern colonies in Maine. Tern chicks found dead within productivity plots after 15 days are now subtracted from the final productivity estimate.

Incidentally, the GOMTWG is a group of scientists, managers, researchers and private individuals from state, federal, non-profit and private organizations involved with seabird population



monitoring in the state of Maine. Restoring a productive tern colony to Seal Island partially fulfills GOMTWG's objective to restore colonies in each of Maine's major bays.

Terns fed less during 1994 and chicks grew more slowly and fledged lighter than in 1993, further reflecting a poor fish year. The major prey items were Hake (55.6% of the known feedings) and Herring (28.8% of the known feedings), with smaller amounts of Pollack, Sand Lance and amphipods.

### Gulls

For the first time in four years, there was significant predation by gulls on the nesting terns. There were 23 recorded incidents of gulls preying on terns during 1994, but this is undoubtedly a fraction of the actual number of tern chicks taken. It is probable that 100 to 150 chicks were eaten during the season. At least 152 gulls nested on the island during 1994; all nests were punctured so that the eggs would not hatch, but the adults would continue to incubate them. Four Herring and two Great Black-backed gulls were shot with a .22 caliber rifle. All the gulls shot were either in the colony or trying to work their way in to nesting groups of terns.

Laughing Gulls were also observed flying over the island with more frequency in 1994. As at other colonies where Laughing Gulls and terns coexist, there was some evidence of kleptoparasitism. No Laughing Gulls nested on Seal Island (they have never been recorded nesting there).

### Leach's Storm-petrels

Nesting petrels were counted during 1993. An estimate of active burrows was made, although it is extremely difficult to determine which burrows are indeed active. A total of 593 nests were estimated for the entire island, with heaviest concentration occurring in Area 3 (see attached map).

### Other Nesting Species

Double-crested cormorants, Common Eiders, Savannah Sparrows, Spotted Sandpipers, Yellow Warblers, Common Yellowthroats, and Northern Ravens also nest on Seal. The Ravens nested in the same nest that they have nested in since 1993. The nest was abandoned this year, after the pair hatched four chicks. The research crew arrived on the island earlier than usual, and Ravens are extremely sensitive to human disturbance. Usually the Ravens move their chicks to the far end of the island to avoid contact with the researchers. By doing so, they also avoid conflict with nesting terns, though they prey on Common Eiders, their eggs, and Black Guillemots.

### Banding

One hundred thirty four tern chicks were banded on Seal Island, 37 Common Terns and 97 Arctic Terns. Adult Atlantic Puffins were also snared and banded, or worn bands were replaced. Four adults captured were unbanded, while two adults were captured and their bands replaced. Two chicks of the year were banded.



Evaluation of the impacts of livestock grazing  
and habitat restoration on tern nesting islands  
in the Gulf of Maine

**Introduction-** Maine's coastal islands have been used for grazing sheep for over 350 years. In the 1830s, Maine was one of the largest sheep grazing states in the Northeast (Fallon 1991). With grazing and other farming and homesteading practices, the landscape of coastal islands changed from spruce and fir to open meadow, a

habitat suitable for many species of nesting seabirds. However, grazing on coastal islands remains controversial, as some opponents argue that island habitat becomes less diverse, and some species like Common Eiders (*Somateria mollissima*) are precluded from nesting in areas that have been grazed. Also frequently cited is an article published in *Natural History* (Furness 1989) which documented a sheep that had learned to eat tern chicks in Scotland (though the author observed the sheep flock for hours, he saw only one individual exhibiting this carnivorous behavior; yet this case is commonly referred to as evidence that sheep flocks can decimate tern colonies). Nisbet (1971) also suggested that Laughing Gulls (*Larus atricilla*) deserted an island in Massachusetts after the introduction of sheep.

**Justification-**There have been no published studies of the impacts of sheep/goats grazing on tern nesting islands. However, Common (*Sterna hirundo*) and Arctic (*Sterna paradisaea*) terns prefer sparsely vegetated or low-vegetation areas to nest (Burger and Gochfeld 1991), habitat which grazing animals may provide at a lower overall impact to habitat than other vegetation management tools such as mowing, burning or salting. Using a management practice which is an historic and traditional use of islands in Maine the proposed study will evaluate the impacts of sheep on three tern nesting islands in the Gulf of Maine under the following hypotheses:

- Enclosing nesting terns on islands where terns and sheep coexist will have no effect on the reproductive success of terns.
- Grazing sheep/goats on tern nesting islands will have not effect on "rank" vegetation which is unsuitable as tern nesting habitat.
- Behavioral observations of grazing sheep/goats will reveal no significant differences in preference of forage available on the islands.
- Grazing sheep on tern nesting islands will have no effect on habitat diversity.
- Grazing sheep on tern nesting islands will have no effect on other nesting seabirds.

**Methods and study area-** Metinic, Petit Manan, Little Nash and Seal Islands are all potential sites for the proposed study.

The USFWS service owns 80 acres on Metinic Island. Sheep have been grazed there for more than a century, and terns have nested on the island since 1931 (GOMTMP, unpubl. data.). Approximately 50 pairs of Arctic and 10 pairs of Common terns occur on a 2-acre portion of



Service land (Drury, unpubl. rept). This area is concurrent with the round-up area used during June to corral the sheep for shearing. Eggs and chicks are trampled when the sheep are stampeded toward the corral, making estimates of tern reproductive success following normal grazing activity unobtainable. We propose to enclose the tern nesting area with 5-strand electric fencing so that sheep are unable to enter. Vegetation changes and changes in total population of nesting terns and Common Eiders will be monitored in the fall of 1994 and the spring of 1995.

Petit Manan Island is owned by the USFWS and is one of the most diverse seabird nesting islands in the Gulf of Maine. Along with Laughing Gulls, Common Eiders, Common, Arctic and Roseate (*Sterna dougallii*) terns, Black Guillemots (*Cyphus grylle*), Atlantic Puffins (*Fratercula arctica*), and Leach's Storm-petrels (*Oceanodroma leucorhoa*) nest on the island. Recently, an increase in "rank" or unsuitable tern nesting habitat has been noted on the island. Terns have shifted nesting locations to more suitable areas on the island, and concurrently the number of Laughing Gull pairs has increased. Sheep were grazed on Petit Manan during the late 1800s until the USCG ordered lightkeepers to remove them.

Seal Island is a large, 65 acre island where terns, puffins, guillemots, storm-petrels and eiders nest along with Great (*Phalacrocorax carbo*) and Double-crested Cormorants (*Phalacrocorax auritus*) occur. Seal Island also has a history of sheep and other livestock along with nesting terns and puffins since at least 1880 (Norton 1916). Currently, terns are restricted to the gull-free, northern end of the island where vegetation is lowest. The area between the tern nesting area and the cabin consists of high grass. There are no nesting Common Eiders or Leach's storm-petrels in this area.

Behavior observations of grazing animals are proposed for either Seal or Petit Manan islands. The animals would be introduced to a designated area after the nesting season and be kept on the island through November. Grazing animals could then be reintroduced in May, when the crew came out for their regular season, to a confined area to determine habitat changes during spring and summer months.

Both areas have facilities for researchers to camp during the study period. However, Roseate Terns do not nest on Seal Island, so unwanted habitat destruction for this species would not be a threat on Seal. Also, the timeframe for behavioral observations would be end of September to November, which coincides with construction of the boathouse and lighthouse repair on Petit Manan Island. Because of these two factors, we will pursue behavioral studies of grazing animals on Seal Island and seek alternative methods for vegetation management on Petit Manan.

A proposed study area for Seal is a strip of vegetation containing varied habitat and field which would be small enough to monitor the



effects of grazing animals during the short time in fall. The field would be split in two sections so that one site would be grazed during both fall and spring/summer, and one site would be grazed in fall only.

Grazing studies on Nash Island will not be pursued during this project. However, we intend to sample nesting Common Eider densities on Little Nash, Big Nash and the Ladle, with permission of the owner. All three of these islands are used to graze sheep year-round.

**Schedule-** August-September 1994: Baseline vegetation studies of Metinic Island (USFWS portion).

Erect electric fence around tern nesting area

Baseline vegetation study of Seal Island

Erect electric fence around proposed grazing area on Seal Island

Transport sheep to Seal Island

October 1994: Behavioral observations of grazing animals

November 1994: Vegetation measurement of grazed area; remove grazing animals from island.

December 1994: Preliminary results of study due

May 1995: Transport sheep/goats to Seal Island/preliminary measurement of vegetation

June 1995: Measurement of vegetation on Metinic Island/seabird census of surrounding area and exclosed area.

August 1995: Remove grazing animals from Seal Island/vegetation measurement

The exact methods used to measure vegetation will be discussed and included in the final proposal. The number and species of grazing animals to introduce at the study area will be discussed and included in the final proposal.

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#### Preliminary Results of the Grazing Study

Two enclosures were constructed using lightweight electric fencing. Four to five strands (depending on terrain) of polywire was strung between wooden cornerposts and supported with plastic fence posts at 3 meter intervals to mark the grid squares for a vegetation study. The fence was charged with a solar fence charger. Sheep enclosures were 15 X 30 m and goat enclosures were 15 X 15. The enclosures were structured so that fall grazing could be monitored, and in 1995, they could be expanded to test the effects of fall and summer and summer only grazing. Three sheep from Metinic Island and two Cashmere goats were put in the two enclosures.

The sheep travelled well in boats, remaining stationary during the voyage while tethered. Both species learned quickly to avoid the electric fence after being led to the fence where they touched it once with their noses. None of the sheep escaped from the enclosure; however, one goat went through the wires four times to get vegetation. Maintenance of the animals entailed very little work. Drinking water was supplied.

Mean % vegetation cover changed from  $97.5\% \pm 4.9$  to  $78.6\% \pm 16.9$  in the sheep enclosure, while goats changed vegetation cover from 100% to  $96.6\% \pm 4.2$ . Sheep also exposed more rock and dirt than did goats.

Livestock grazing appears initially to be effective, at least in the short term, for vegetation management. Vegetation density and height were reduced during fall grazing by both sheep and goats. Sheep had a greater impact on the land than goats by producing more areas of exposed rock and dirt in their study enclosure. Both sheep and goats ate green vegetation of all species in their enclosure, although goats preferred grazing on the perimeter. Livestock contained within portable electric fencing could provide effective vegetation control with less human labor than other methods, no introduction of chemicals, and no apparent negative impacts to other seabirds. A Leach's Storm-petrel nested in the

sheep enclosure and was able to fledge its young. On Little Nash Island, where 29 ewes and 8 lambs graze on 9 acres, there were 98 Common Eider nests counted, and over 400 Great Black-backed and Herring gull nests.

On Metinic Island, a 0.85 acre enclosure was constructed on the island's northern point to keep sheep out. The enclosure was erected in December, but no power source was connected to the fence over the winter. Long-term plans are to permanently fence the sheep out of this area to allow vegetation to grow. Should nesting Common Eiders be attracted to this area, some amount of gull control may be considered, as all eiders attempting to nest in the area of the gulls are unsuccessful in fledging hatched young. A disparate band of Arctic Terns has also attempted to nest on the northern point with no success, due to predation by Great Black-backed gulls. One sentiment from a private landowner on the island was that the USFWS would be growing eider and tern chicks for the gulls. Gulls nest on several other areas of the island and could be removed from the point without affecting the rest of the nesting population.

Matinicus Rock Seabird Project, Penobscot Bay, Maine. Steve Kress, Principal Investigator, National Audubon Society (NAS).

It was a substantially foggy summer with little rain on Matinicus Rock. Of 92 days on the island, 41 were fog-filled.

The Matinicus Rock crew was on the island from early May to the end of August.

Objectives:

- a. Continue identification of banded puffins noting origin and monitoring puffin breeding success.
- b. Continue Arctic tern feeding studies, assessment of their reproductive success and chick growth.
- c. Continue study of burrow use by Leach's Storm-petrels.
- d. Implement a Common Murre attraction program to restore the former breeding range of this species.

Matinicus Rock is a 28 acre island in outer Penobscot Bay, and one of the most diverse seabird colonies on the Atlantic coast. It is the largest Arctic Tern colony in Maine and the only island in Maine which retained its Atlantic Puffin population through the plume hunter era in the late 1800s. Three species of terns, Laughing Gulls, Leach's Storm-petrels, Common Eiders and three alcid species nest on Matinicus Rock, as well as Tree Swallows,

Barn Swallows, Spotted Sandpipers and Savannah Sparrows. It is an island rich in human history; the first lighthouse was built in 1827 and there are many tales associated with the lightkeeper's office. The famous lighthouse heroine Abbey Burgess lived on Matinicus Rock from 1853 to 1875.

In 1901, the NAS began to employ lightkeepers as the first wardens to protect seabird populations which were being decimated elsewhere for food and feathers. Carl Bucheister (a past president of NAS) and his wife Harriet, took a special interest in the island and spent time there from 1936 to 1981 studying storm-petrels and observing the terns and alcids. In 1979, the Puffin Project began to send researchers out to study puffins in what was then the only remaining colony in Maine. Today, NAS continues to research seabirds on Matinicus Rock. A cooperative agreement with the USFWS provides NAS with funding to conduct research, however, most funding is provided by NAS.

#### Puffins

Puffin observations were conducted on 68 days between 21 May and 17 August. A total of 130 banded individuals were seen throughout the season with a maximum of 51 in one day. Banded birds from Eastern Egg Rock, Matinicus Rock, Seal Island, Machias-Seal Island and Petit Manan Island were observed on Matinicus Rock.

A total of puffin burrows were checked for breeding activity, and a total of 143 were determined to be active. A record number of 50 puffin chicks were banded.

#### Razorbills

Razorbills were more abundant in 1994 than previously noted. They were seen more frequently over much of the island, standing in groups on the small islet off the northwest shore, visiting the artificial murre colony, or crowding puffins off the loafing ledge. High counts of Razorbills were made early in the season when they were rafting up - over 140 were seen on 19 May. A total of 52 active nests were found, and of these, seven were known to have failed.

#### Common Murres

The Common Murre restoration project is now in its third year. It was modified this year based on knowledge acquired and questions which have arisen during the past two years. This project is based on the premise that colonial seabirds can be attracted to suitable breeding habitat through the illusion of an active colony. It is primarily the young that can be swayed to start a new breeding colony. Their youth requires that the experiment be a relatively long term investment, allowing for poor survival years and for successful murres to come of breeding age.



An artificial murre colony was set up on the southeast side of Matinicus Rock on some of the highest ledges which drop quickly to the ocean. A self-regulating sound system consisting of a compact disc player powered by a solar recharged 12 volt battery was installed near the decoy sites. An amplifier projected murre sounds through two outdoor weatherproof speakers which were mounted to the rocks. Recordings were obtained from the Library of Natural Sounds, Cornell Laboratory of Ornithology and were played continuously.

There were 66 days in 1994 when the artificial murre ledge was observed, and on 35 days murres were observed in the decoys. Eighteen behaviors were recorded, including copulation among live birds. For a more detailed account of the murre restoration project, refer to Schubel and Kress 1994 unpublished report for the 1994 season on file at Petit Manan NWR).

#### Leach's Storm-petrel

A total of 706 active burrows were found on Matinicus Rock. Only 14 adults were found which had been banded as chicks. Fourteen adult storm-petrels were banded.

#### Terns

The first Arctic Terns were laid on 28 May, and the first fledglings were observed on 11 July. A total of 1,267 nests were found, with a species ratio of 17% Common Terns, 83% Arctic Terns. No Roseate Terns nested on Matinicus Rock during 1994. Hatching success for 61 Arctic Tern nests was 79.6%; fledging success was 81.4%. Arctic Terns fed primarily white hake (77.5% of the known feedings observed) to chicks, with smaller percentages of Herring, Butterfish, Sand Lance and amphipods.

There were numerous incidents of marauding gulls during July. It is difficult to know how many attempts and successful predations occurred due to poor visibility. One predatory Herring Gull was shot, and three sick or injured Herring Gulls were also shot.

#### Gulls

No Herring or Great Black-backed gulls were permitted to nest on Matinicus Rock. Laughing Gulls continued to increase, a trend that has been noted since 1991. A total of 290 nesting pairs were counted on 15-16 June.

#### Banding

Six Arctic Tern adults and 86 chicks were banded; two adult Atlantic Puffins and 50 chicks were banded; 14 Leach's Storm-petrel adults were banded.

## E. ADMINISTRATION

### 3. Other Manpower Programs

The National Audubon Society maintains a research station on Seal Island for the Puffin Project. Usually two to four paid employees or volunteers are on the island at a time. This year NAS staff included Rick Schauffler, Matt Drennan, James Smart, Tammy Jackson, Donna Ramil, Kristin Williamson, Laird Henkel, and Kriss Neuman.

### 4. Volunteer Programs

This years research team was aided by volunteers Ed Hearne, Wing Goodale, Wendy Fox, Rick Smith, Laurie Burch, Marisel Comulada, Beth Conklin, Martha Fisher, Chris Hymes, Taeko Imaizumi, John Quimby, Lorraine Schepis, Diane Tessaglia, and Lynne Waltke. The fourteen volunteers accumulated a total of 165 volunteer-days on the island.

National Audubon Society received an Outstanding Contribution Award for their years of dedicated volunteer support on Seal Island. The award was presented on 9 July by RD Lambertson and DRD Short at Acadia National Park Headquarters. The following day the group toured Seal Island and NAS gave an update of ongoing research activities.

## F. HABITAT MANAGEMENT

### 1. General

Seal Island is vegetated with a variety of grasses and forbs interspersed with granitic ledge and rocks. Representative plant species include New York aster, beach pea, yarrow, raspberry, gooseberry, chickweed, shepherd's purse, creeping juniper, ragweed, and red fescue. The only trees on the island are balsam poplars which reach a maximum height of only three to four feet before they die back from the salt spray. The uncommon plant roseroot stonecrop, Sedum rosea, is exceptionally abundant on Seal island, making it one of the most significant southern stations of this species in the eastern United States, along with scotch lovage, Ligusticum scothicum, and seaside angelica, Coelopleurum lucidum. Other rare plants are oyster leaf, Mertensia maritime, seabeach sandwort, Arenaria peploides, and the rare plant Sedum rosea,

roseroot stonecrop.

Although not used as a target since 1952, the effects of the bombing and shelling can still be seen. Small craters and scarred granite are abundant, but the rank growth of grasses and raspberry has concealed most of the damage. Even the effects of the 1978 peat fire are fading beneath a quickly growing peat layer.

Matinicus Rock is also treeless and vegetated with a variety of native and exotic grasses and sedges, and herbaceous species such as aster, yarrow, beach pea, chickweed and raspberry.

## 12. Wilderness and Special Areas

Seal Island was listed on the State Register of Critical Areas in January 1976 for its unique value to nesting black guillemots and Leach's Petrels. At the time of designation, the island supported the largest petrel colony in the eastern United States with 2,000 pairs, and one of the largest black guillemot colonies, 200 pairs, in Maine. An updated guillemot census was conducted by the Audubon Society in 1988. They located 454 guillemot burrows, with a total estimate of 500 pairs nesting.

## G. WILDLIFE

### 1. Wildlife Diversity

We have supported the seabird colony restoration project for several reasons. Our concern for terns is based on the well-documented region-wide population decline which began in the 1940's, much of which is due to competition with herring and great black-backed gulls for nest sites, and predation by gulls on tern eggs and chicks. Any restoration work is realistically limited to field station sites because gull control is a never-ending task. Therefore, the Audubon Society and the Service had to make a long-term commitment and establish a field station if there was to be any hope of success.

Although far from endangered, Atlantic puffins have been declining in the western Atlantic since the 1920's. The Great Island, Witless Bay, Newfoundland colony has declined by 20-30% since 1975 because of gull predation, food scarcity, environmental contamination, mortality from fishing nets, and illegal hunting.

The environmental education impact of this project should not be underestimated. Puffins are very popular birds and attract quite a bit of attention from the general public, not just dedicated birders. By getting their attention with puffins, we have been

able to show people the problems associated with the burgeoning gull population, with ocean fisheries overharvesting, and marine contamination.

### 3. Waterfowl

The Audubon Society reports that since the gull control began, more eider chicks are surviving to flight size. The first year it was rare to see a chick more than a couple days old, as most were gobbled up by the gulls. Since 1988, many creches now remain near Seal and many older chicks are seen throughout the season.

Occasionally, other species such as blue-winged teal and black ducks use the small freshwater pools on the island.

### 5. Shorebirds, Gulls, Terns, and Allied Species

See Section D.5.

### 6. Raptors

The Maine coastal islands are very important to raptors during the spring and fall migrations. Peregrine falcons and merlins in particular use the outer islands.

### 9. Marine Mammals

If Seal Island did not have seals, we'd have to change the name! Both harbor and gray seals are common throughout the year.

Fin, minke and humpback whales are sometimes seen in the surrounding waters. Minkes, like terns and puffins, feed primarily on small herring, and often come into the coves on the western side of the island.

### 15. Animal Control

The success of the puffin and tern colony restoration is contingent upon many variables, but the first step is to clear the island of nesting herring and great black-backed gulls to eliminate nest site competition and reduce egg and chick predation.

Gull control, which in the past has been a major component of the Puffin Project's activity on Seal Island has, over the last few years, diminished considerably. For the first time in four years there was significant predation by gulls on terns. There were 23 recorded incidents of gulls preying on terns this summer which is only a fraction of the actual number of tern chicks actually taken.



All 152 gull nests encountered during the gull census were punctured and four herring gulls and two black-backed gulls were shot throughout the season.

No poison was distributed on Matinicus Rock this year, although it was used in 1990 on 25 gull nests at the request of the National Audubon Society.

#### 17. Disease Prevention and Control

In 1990, in early July over 40 dead eiders and numerous dead gulls were found by NAS researchers on the southern end of the island. Avian cholera, which is endemic among Maine's nesting eider population, was suspected. Because the island is only resupplied every two weeks, and because there is no refrigeration, no fresh carcasses could be sent to the National Fish and Wildlife Health Lab. No dead birds were reported this year.

### H. PUBLIC USE

#### 1. General

Due to the presence of unexploded ordnance on the island, it is closed to all public use. The National Audubon Society team is issued a Special Use Permit for their work and are individually required to sign releases absolving the Service of any liability should someone be injured by the ordnance.

#### 11. Wildlife Observation

Boating trips to Seal Island and Matinicus Rock increased this year. Atlantic Expeditions out of St. George brings bird watchers out to the refuge islands to observe puffins, terns gulls, eiders, guillemots, and marine mammals such as harbor porpoises and minke whales. "Watchers" do not land, but they do stop long enough to allow the Audubon folks to get on board and give a short talk on the seabird restoration project, and the biology and conservation challenges affecting Maine coast wildlife. Ten to 15 people normally come on the daylong trips.

This summer the 10,000th bird watcher took part in these boat tours. A portion of the fare from these tours are donated to the Puffin Project.

## J. OTHER ITEMS

### 3. Items of Interest

A revenue sharing check for \$1,460 was presented to Knox County this year as compared to \$1,525 last year.

### 4. Credits

JM: Section D.5.

BB: All other Sections.

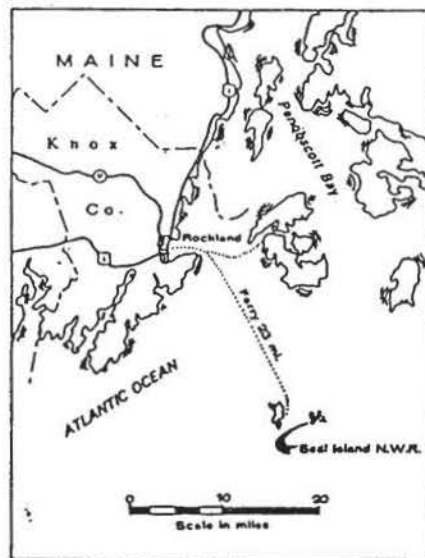
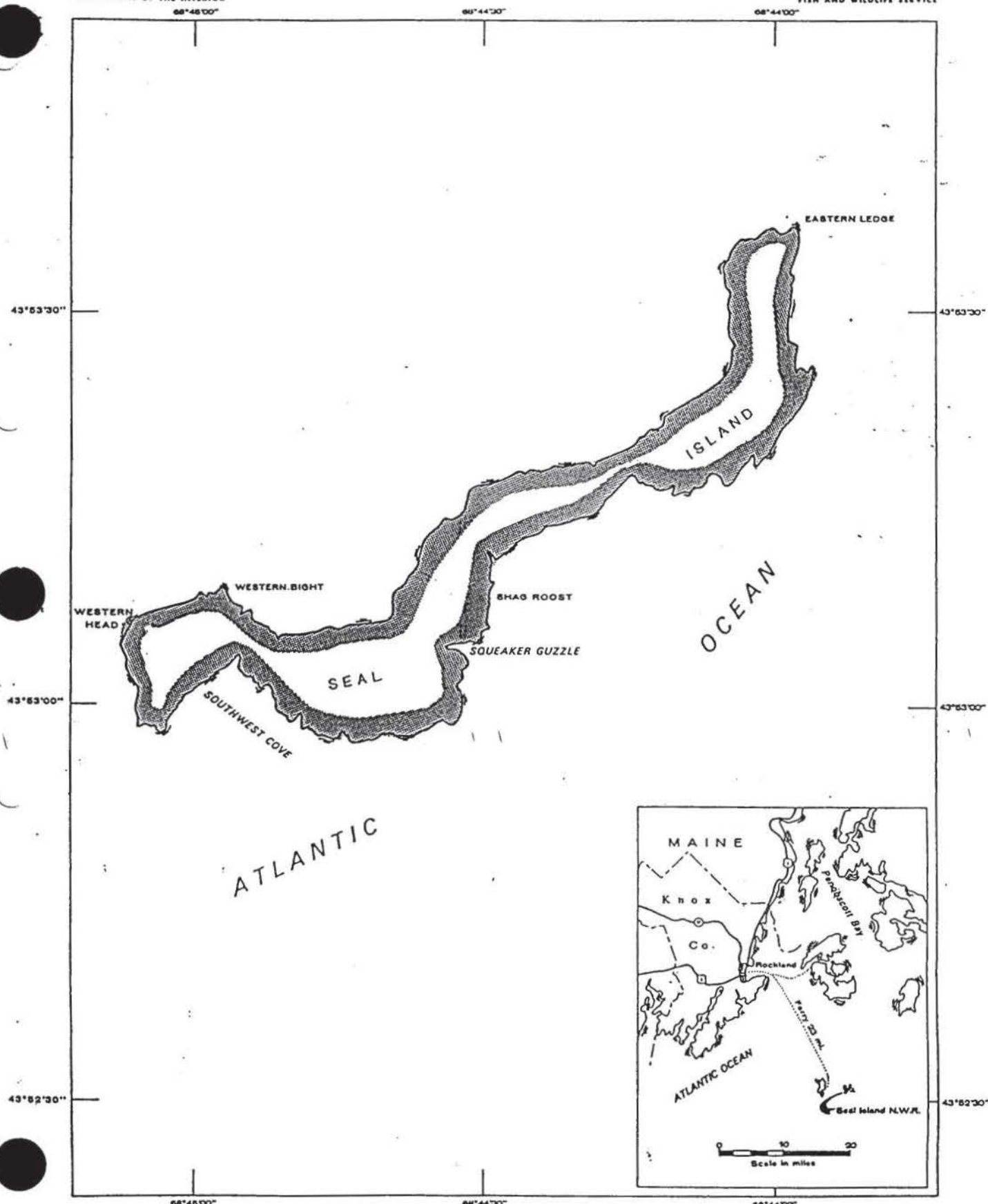
Photos:     Cover and Sheep Grazing: Brian Benedict  
              Puffin: Myer Bornstein

# SEAL ISLAND NATIONAL WILDLIFE REFUGE

UNITED STATES  
DEPARTMENT OF THE INTERIOR

KNOX COUNTY, MAINE

UNITED STATES  
FISH AND WILDLIFE SERVICE



COMPILED IN THE DIVISION OF REALTY  
FROM SURVEYS BY U.S.G.S. AND U.S.F.W.S.

BOSTON, MASSACHUSETTS AUGUST 1978

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MEAN  
DECLINATION  
1983

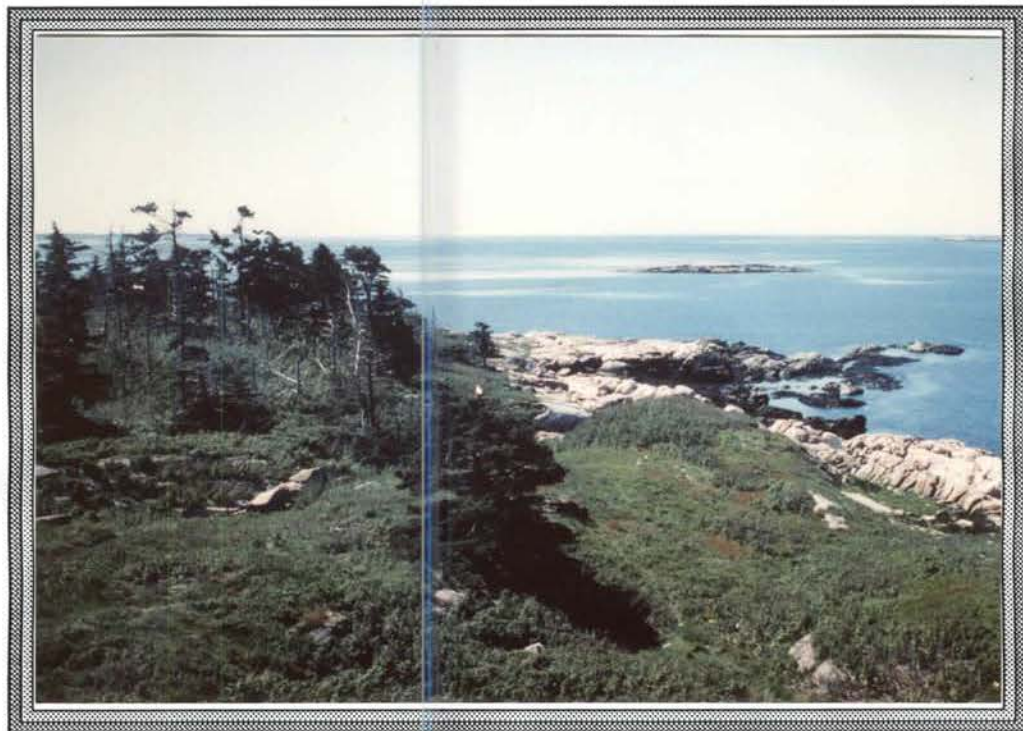
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FRANKLIN ISLAND NATIONAL WILDLIFE REFUGE

Friendship, Maine

ANNUAL NARRATIVE REPORT

Calendar Year 1994



View from Franklin Island Lighthouse.

TG



## INTRODUCTION

Franklin Island is located in Muscongus Bay, Maine, six miles from the town of Friendship, in Knox County. This 12 acre island is all upland, vegetated with red spruce, raspberry, rugosa rose, and various grasses and forbs. It has a very acidic, organic duff soil layer over glaciated granite and schists. Maximum elevation is 35 feet, and the average tidal range is nine feet. It was acquired in 1973 from the Coast Guard, which still maintains an automated lighthouse tower.

Acquisition was authorized under 16 U.S.C. 667b-d, an Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes. The purpose of the refuge is "... of particular value in carrying out the national migratory bird management program" (Appendix B, National Wildlife Refuge System Draft EIS).

The Two Bush Island unit of the refuge is located about 16 miles east of Franklin Island, and seven miles south of the town of Owls Head. Two Bush is a small, eight acre island owned by the Coast Guard. It is leased at no charge to the Fish and Wildlife Service for five year periods. It, too, has an automated lighthouse tower.

## B. CLIMATIC CONDITIONS

The climate of the Muscongus Bay area is moderated by the surrounding ocean. Summer temperatures are significantly cooler and winter temperatures warmer than nearby inland areas. In the Rockland area the average annual temperature is 46, precipitation is 47 inches, and the growing season is 143 days. Fog is an important influence on coastal ecosystems, occurring an average of 21% of the time during the summer.

## E. ADMINISTRATION

### 1. Personnel

The refuge is administered and funded out of the Petit Manan office in Milbridge.

## F. HABITAT MANAGEMENT

### 1. General

Franklin Island is vegetated primarily with raspberry, rugosa rose, and various grasses and forbs. About half of the island is sparsely treed with red spruce, with a dense raspberry understory. The raspberry stands provide excellent eider nesting cover.

Two Bush is treeless but densely vegetated. Typical plants include raspberry, timothy, yarrow, nightshade, angelica, bayberry, rugosa rose, scotch lovage, and buttercup.

There is no active habitat management on the refuge at this time.

### 2. Forests

Franklin Island was undoubtedly forested at one time with red spruce. About half of it was cleared when the light-station was built in 1806. Some say that the dead trees on islands like this were killed by the acidic droppings of cormorants, but this has never been proven.

Two Bush Island may have been forested at one time, but is now treeless.

### 12. Wilderness and Special Areas

Franklin Island was listed on the State Register of Critical Areas in October 1977 for its unique value to nesting eiders. Registry Title is "Franklin Island Eider Nesting Area", see Section G.3.

## G. WILDLIFE

### 3. Waterfowl

The dense raspberry understory on Franklin provides excellent nesting habitat for common eiders. Nesting density is the highest in the State with over 1400 nests packed into less than six acres.

Approximately 75 eiders have nested on Two Bush Island.

### 4. Marsh and Water Birds

Franklin Island has a growing colony of approximately 30 pairs of black-crowned night herons. The island's sparse spruce stand with many snags provides good heron nesting habitat.

## 5. Shorebirds, Gulls, Terns, and Allied Species

In May 1992, the island was censused by refuge staff as part of the Seabird Nesting Island Census. The following is a breakdown of birds observed:

Herring Gulls	167
Black-backed Gulls	13
Common Eiders	31
Black Guillemots	3
Cormorants	33

Leach's storm-petrels also nest on both islands; they were encouraged to nest on Franklin by the National Audubon Society in the early 1980's through the use of vocalization recordings and burrow construction.

Two Bush Island was identified as a good potential tern recolonization site by the Gulf of Maine Tern Working Group in 1990. The island supports suitable common, arctic and roseate tern habitat. Its past history as a tern colony, its strategic location in Penobscot Bay, federal ownership, and similarities to Petit Manan Island make it an ideal spot for expanding tern restoration efforts. The Coast Guard was supportive of the project and expressed a desire to have interns use the automated tower for living and observation. Establishment of a field station on the island and initiation of gull control was scheduled for the 1991 field season, but staff transfers prevented this from occurring.

Meetings continued regarding the Two Bush Tern Restoration Project. There is some hesitancy from the State to embrace this effort. According to State records terns have not nested there in nearly 100 years. However, over the past years Bill Drury and John Anderson have observed "roving" bands of common terns in the area. Former Manager Goettel and Drury visited the island on 29 June 1990 and observed a lone common tern nesting on Little Two Bush, which is 100 yards off shore from Two Bush and owned by the State. This bird successfully hatched its clutch.

During the 1992 breeding season seven terns were observed on Little Two Bush and nest scrapings found.

## 6. Raptors

Two pairs of ospreys nest on Franklin.

## H. PUBLIC USE

### 1. General

Both units of the refuge are closed to all public use during the seabird nesting season, April 1 through July 31.

Pleasure boat traffic is more common in this area of Maine than in the Milbridge area, and the picturesque lighthouses do attract some visitors. Fortunately, landing on both islands is difficult, which discourages most.

### 3. Outdoor Classrooms-Teachers

Students from the nearby Audubon Ecology Camp in Medomak regularly visit Franklin Island during the summer on their field trips around Muscongus Bay.

## J. OTHER ITEMS

### 3. Items of Interest

A revenue sharing check for \$847 was presented to the town of Friendship this year, up from \$729 last year.

### 4. Credits BB: All Sections.

Photo: TG - Tom Goettel

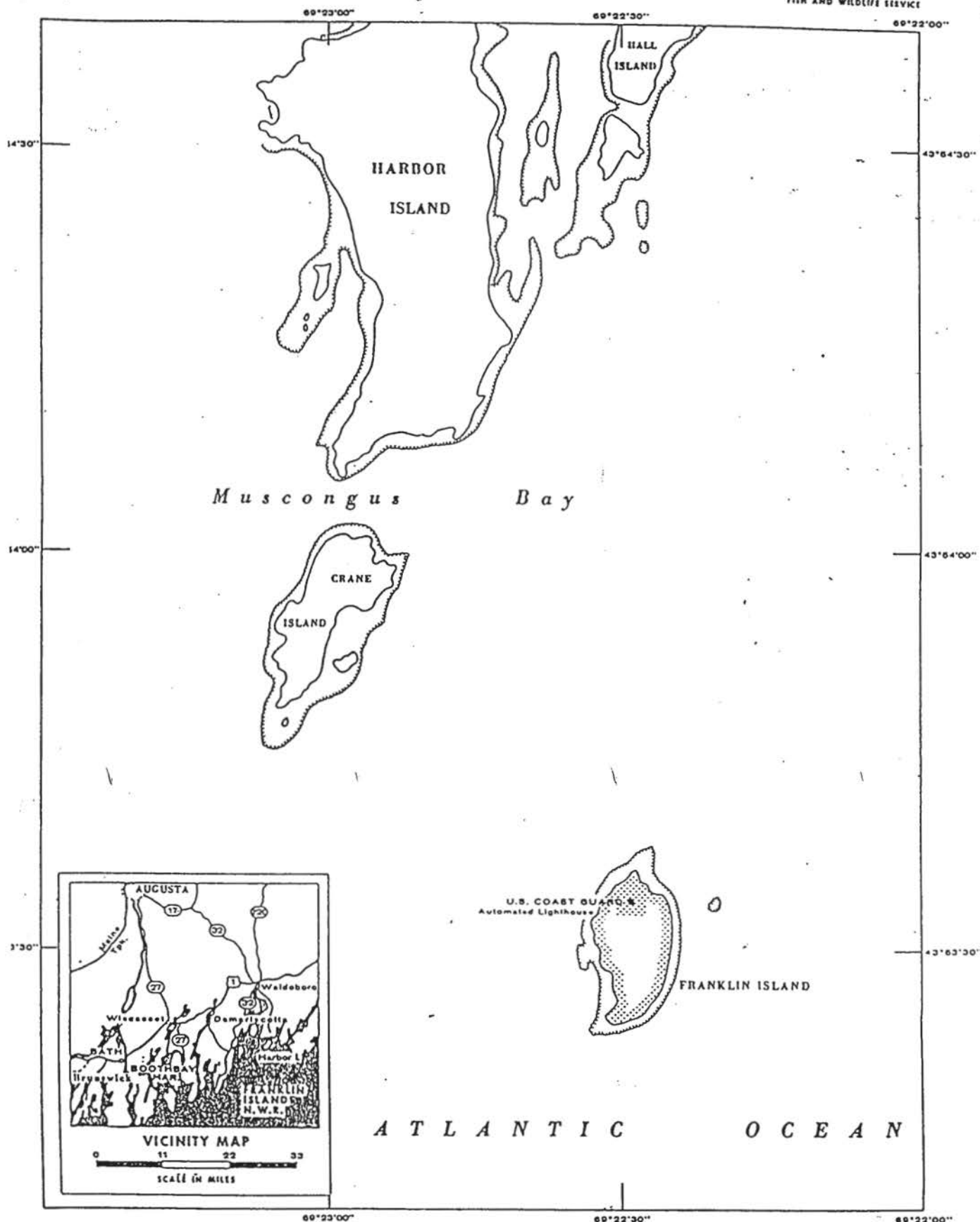


# FRANKLIN ISLAND NATIONAL WILDLIFE REFUGE

UNITED STATES  
DEPARTMENT OF THE INTERIOR

KNOX COUNTY MAINE

UNITED STATES  
FISH AND WILDLIFE SERVICE



COMPILED IN THE DIVISION OF ENGINEERING  
FROM SURVEYS BY O.S. AND S.L.V. & W.

BOSTON, MASSACHUSETTS

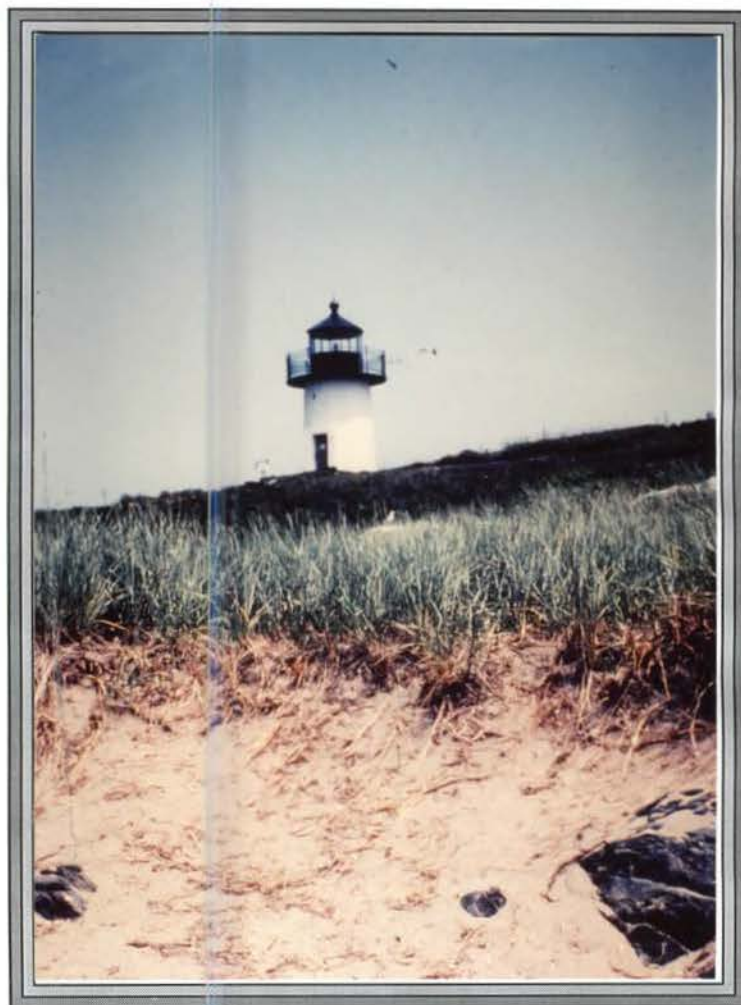
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POND ISLAND NATIONAL WILDLIFE REFUGE

Popham, Maine

ANNUAL NARRATIVE REPORT  
Calendar Year 1994



Pond Island Light

AH

## INTRODUCTION

Pond Island is located at the mouth of the Kennebec River in Casco Bay, Maine. The island is about 16 miles northeast of Portland in the town of Popham Beach, Sagadahoc County. This 10 acre treeless island is all upland, about 75% vegetated with mixed grasses and shrubs. The base is chiefly Algonquian sedimentary schist with numerous white quartz intrusions. The soil is a thin mantle of sandy loam grading to sterile sand around the perimeter. Most of the shoreline is rugged, cleaved rocks except for a small sand beach area in the northwest corner. The island surface grades from MSL to a rather flat top at the 30 foot MSL contour. There is a fast rip-tide past the island, with an average daily rise and fall of 9 feet.

The island was acquired from the U.S. Coast Guard in 1973. The Coast Guard maintains a remote navigational aide (lighthouse) and fog signal in the north-central part of the island by a right-of-way. Transfer of lands was authorized under 16 U.S.C. 667b-d, an Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes. The purpose of the refuge as stated in Appendix B to the National Wildlife Refuge System Draft EIS (Dec 89) is, "... of particular value in carrying out the national migratory bird management program."

Colonial nesting seabirds include eider ducks, and herring and great black-backed gulls. Migrating black ducks, teal and Canada geese rest and feed in the area. In the early 70's the area was identified for its value to nesting common terns and Leach's petrels. Neither of these species have been observed since the early 80's. As has happened on many of the tern nesting islands in Maine, the nesting gulls probably usurped the terns.

## B. CLIMATIC CONDITIONS

The climate is oceanic, subject to oceanic fogs and storms, but is tempered somewhat by the moderating effect of the Atlantic Ocean. Temperature extremes range from -20 to 90. Summer days in the 70's are common, and winters in the 20's are seasonal averages. Generally, the temperature is 15 cooler in summer than the mainland. Precipitation varies annually, with 45 inches being average. "Nor'easters" may drop up to four inches of rain during a 24 hour period. Due to wind action, very little snow stays on the island, though total fall annually may exceed 100 inches. (Biological Reconnaissance Report, 1972)

## C. LAND ACQUISITION

### 2. Easements

The U.S. Coast Guard has an easement on a 120 foot wide swath from the lighthouse plot (40'x40') to the water for buried telephone lines (under-water/land-connected). These lines recharge and operate the lighthouse and fog signal.

## E. ADMINISTRATION

The refuge was administered by Parker River NWR in Massachusetts from 1973 through 1990. Administrative duties transferred to Petit Manan NWR in 1991.

## F. HABITAT MANAGEMENT

### 1. General

There is no active habitat management on the refuge at this time. Management has been directed towards resource protection due to budget and personnel constraints. The islands in the mouth of the Kennebec River have been identified in MDIFW's and GOMTWG's Tern Management Plans as high priority tern restoration areas. Gull control would be necessary to return historic nesting colonies of terns.

### 5. Grasslands

About 75% of the island is vegetated. The vegetation consist of mixed grasses, dune grass, bayberry, blueberry, Juneberry, poison ivy, raspberry, field sorrel, and beach rose. There is a two acre area of sand with large patches of dune grass that resembles a low-dune type habitat.

### 6. Other Habitats

The island is glaciated, wave-worn, hard, schist ledge rock. The shoreline is steep and rugged with many bare, vertical faces except a small sand beach area. Even here, rocks fringe the sand and make a boat landing treacherous due to high winds and tides.



## G. WILDLIFE

### 3. Waterfowl

A flush count on nesting eiders produced a rough estimate of 125 nesting pairs. Black ducks and Canada geese benefit from the shelter and vegetation on the island, primarily during migration.

### 5. Shorebirds, Gulls, Terns and Allied Species

Nesting common terns, Leach's petrel, and herring and great black-backed gulls were recorded in the early 70's. Since the early 80's only gulls have been recorded. This years visit produced a nesting estimate of 250 herring gulls and 100 Great Black-backed gulls.

Pond Island was visited in June 1992 by refuge staff and Allan Hutchinson of Maine Department of Inland Fisheries and Wildlife to evaluate potential restoration for terns. The mouth of the Kennebec River has been identified as a high priority tern restoration area by Maine Department of Inland Fisheries and Wildlife and Gulf of Maine Tern Working Group's Tern Management Plans. Several key factors support the positive view of this area as a tern restoration site, including:

- 1) The strong history of nesting terns dating back to the late 1800's and on the nearby Sugarloaf Islands as recent as 1987. This was a major nesting colony as recently as 7 years ago, meaning there are many terns on the coast with the existing fidelity to the mouth of the Kennebec.
- 2) The habitat appears intact.
- 3) The gull control and human disturbance aspects appear manageable.
- 4) The mouth of the Kennebec is an extremely productive estuary.
- 5) The key islands for tern restoration in the Kennebec are owned by Maine Department of Inland Fisheries and Wildlife and the Service.
- 6) The initial reaction after the site visit was that tern restoration on these islands would be a high priority task by both the Service and MDIFW. Significant opportunities exist for a joint restoration effort.

## 7. Other Migratory Birds

Nesting sharp-tailed and seaside sparrows have been observed on the island. This summer barn swallows, song sparrows, and a nesting pair of red-winged blackbirds were observed.

## 10. Other Resident Wildlife

Meadow voles are the only year-round residents that have been noted on the island.

## 17. Disease Prevention and Control

No outbreaks of Avian Cholera were reported this year. The last two incidents occurred in 1983 and 1989.

# H. PUBLIC USE

## 1. General

Rocky shorelines, high winds and tides severely limit public use. Access to the island is by boat only, with a limited area of shoreline suitable for safe landing. The refuge is closed during the nesting season, March 1 to July 31.

## 9. Fishing

Pond Island was opened to public fishing in 1985. Fishing opportunities are limited to saltwater fishing from a small area on shore. During peak runs of bluefish and striped bass, some visitors rest or fish from the lower rocky edge along the westerly shore. Visitation attributed to this type of fishing is minimal. Most fishermen prefer the mobility and increased water access via boat.

# J. OTHER ITEMS

## 3. Items of Interest

A Refuge Revenue Sharing Check for \$701.00 was presented to the town of Phippsburg this year, compared with \$710.00 last year.

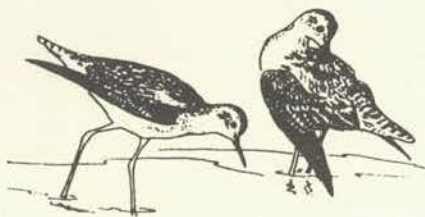
4. Credits      BB: All Sections.      Photo: Allan Hutchinson MDIFW

## Wildlife Calendar

Events may vary by one or two weeks, depending on weather conditions.

### Spring (March-May)

Waterfowl migration begins after ice-out, usually by the end of March. Herring gulls, great black-backed gulls and eiders begin to nest in April, followed by terns, laughing gulls and the alcids (puffins, guillemots and razorbills) around mid-May. Ospreys arrive in April, and eagles begin to nest by the end of March. In the fields and clearings, male woodcocks can be seen and heard performing their courtship flights at dawn and dusk. Male ruffed and spruce grouse start drumming in the woods.



### Summer (June-August)

Summer is the season when nesting seabirds, eagles, ospreys, songbirds and waterfowl raise their young. By mid-July, shorebirds begin to arrive from northern nesting grounds on their long migration south. In August, the terns and alcids begin to migrate. Male eiders start to congregate offshore in large floating flocks, or rafts, for the fall molt.

Deer give birth to their fawns in June. Wildflowers such as orchids, azaleas and iris bloom throughout the spring and summer.



### Fall (September-November)

The shorebird migration peaks in September and the raptor, waterfowl and songbird migrations begin. By late October, large rafts of oldsquaws and buffleheads can be seen offshore. Flocks of black ducks collect on the ponds and bays. Peregrine falcons and merlins glide along the shore. Deer begin the breeding season in November.

### Winter (December-February)

Common and red-throated loons, large flocks of sea ducks and an occasional dovekie, king eider or harlequin duck ride the waves offshore. Great cormorants and Bonaparte's gulls are common. In most years, snowy owls migrate here from the northern tundra. Boreal chickadees, spruce grouse and ruffed grouse are easier to see.

### Year-round

White-tailed deer, snowshoe hare, porcupines, raccoons, bobcats, coyotes and other wildlife species can be seen year-round. The best viewing times are early morning and late afternoon.



## U.S. Fish and Wildlife Service

Petit Manan 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  
Petit Manan National Wildlife Refuge  
Main Street  
P.O. Box 279  
Milbridge Maine 04658  
(207) 546-2124

Hard of hearing or deaf visitors may call the Maine Relay Service at 1-800-437-1220 (TDD) or 1-800-457-1220 (voice).

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



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

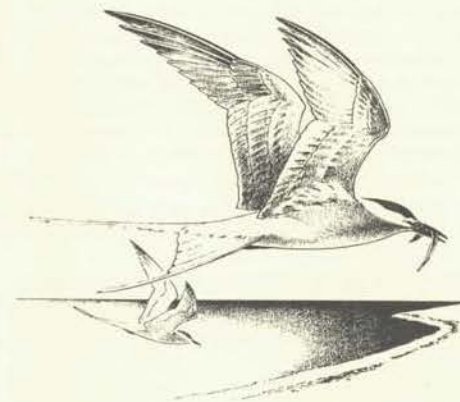
RL-53533

May 1994

★ U.S. GOVERNMENT PRINTING OFFICE: 1994-501-688

# Petit Manan

## NATIONAL WILDLIFE REFUGE



Berry Van Dusen

Steuben, Maine



## Welcome

The coastal islands and peninsulas of Maine form a chain of stopover points along the ocean's shore that is critically important for countless migrating birds. Each year large flocks of waterfowl, raptors (hawks, falcons and owls), shorebirds and songbirds follow this chain as they migrate between northern nesting grounds and southern wintering grounds. Undisturbed offshore islands also offer valuable nesting sites for seabirds. Some of the most important natural areas along this coast are protected and managed by the U.S. Fish and Wildlife Service.

The five national wildlife refuges on the eastern Maine coast offer extraordinary habitat for migratory birds. The mainland site and fourteen rugged islands provide safe nesting, feeding and resting habitat both for colonies of nesting seabirds and for migrating waterfowl, shorebirds, songbirds and raptors.

The mainland property, Petit Manan Point, has interpretive foot trails where you can observe a variety of coastal wildlife.

## Hardly a Wilderness

Though refuge islands are regaining their wild character, they still show signs of their long human history. Native Americans probably used the islands almost from the time the glaciers retreated. Various tribes of the Algonquin Nation used the coast of Maine, fishing and hunting big game, furbearers and birds. Europeans arrived in the 1500s, attracted by the extensive forests and rich resources of the sea. By the 1800s, most of the larger islands supported people for at least part of the year.

Two refuge islands had villages with schools and stores, supporting the mariners who made a living from fishing. Farmers established "saltwater farms" to grow hay and graze sheep. Most islands were clear-cut; some even had mines and stone quarries. The U.S. Lifesaving Service and then the U.S. Coast Guard built and maintained light stations. Several entrepreneurs tried to develop rustic resorts or hunting preserves. And always, seabird colonies provided eggs, feathers and meat for those who harvested them.

All of these activities affected the wildlife populations that traditionally used the islands, particularly the seabirds. The gradual abandonment by humans and protection of many Maine islands has allowed migratory bird populations and other wildlife to begin to return.

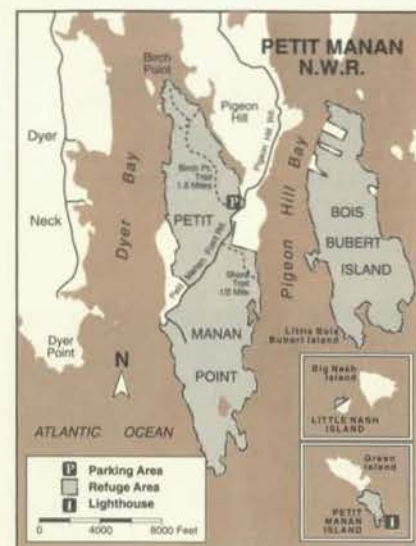
## The Refuges

Refuge lands have been obtained through transfer or purchase with the help of the U.S. Coast Guard, The Nature Conservancy and private individuals.

### Petit Manan National Wildlife Refuge

Petit Manan NWR is a 3,335-acre refuge that includes property on Petit Manan Point, Petit Manan Island and portions of two other islands, Bois Bubert and Nash.

*Petit Manan Point (1,991 acres, Steuben)* has a rugged, windswept character with over ten miles of ocean shoreline. Habitats include red and white spruce forests with some mixed hardwoods, jack pine stands, coastal raised



heath peatlands, blueberry barrens, old hayfields, fresh and saltwater marshes, cedar swamps, granite shores and cobble beaches.

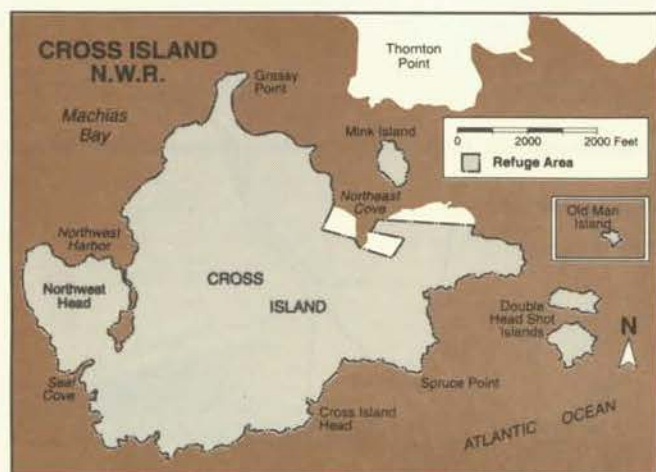
*Bois Bubert Island (1,155 acres, Milbridge)* is much like Petit Manan Point in character and wildlife. It runs parallel to the point, about one mile to the east. Although most of the island is refuge, some private inholdings remain.

*Petit Manan Island (9 acres, Steuben)* lies two and a half miles south of the Point. This treeless island has long been one of the most important islands in the Gulf of Maine for colonial nesting seabirds. It is also the site of an automated U.S. Coast Guard light station with an imposing 123-foot tall granite lighthouse tower that is on the National Register of Historic Places.

*Nash Island (5 acres, Addison)* is a nine-acre treeless island lying about seven miles east of the point. It is a former tern nesting island that now hosts nesting eider ducks and gulls.







## Cross Island National Wildlife Refuge

Cross Island NWR is a 1,703-acre island complex donated to the Fish and Wildlife Service in 1980 by Thomas and Virginia Cabot (through The Nature Conservancy). Located in Cutler, the complex includes six islands: Cross Island (1,654 acres); Scotch Island (10 acres); Outer Double Head Shot (14 acres); Inner Double Head Shot (8 acres); Mink Island (11 acres); and Old Man Island (6 acres).

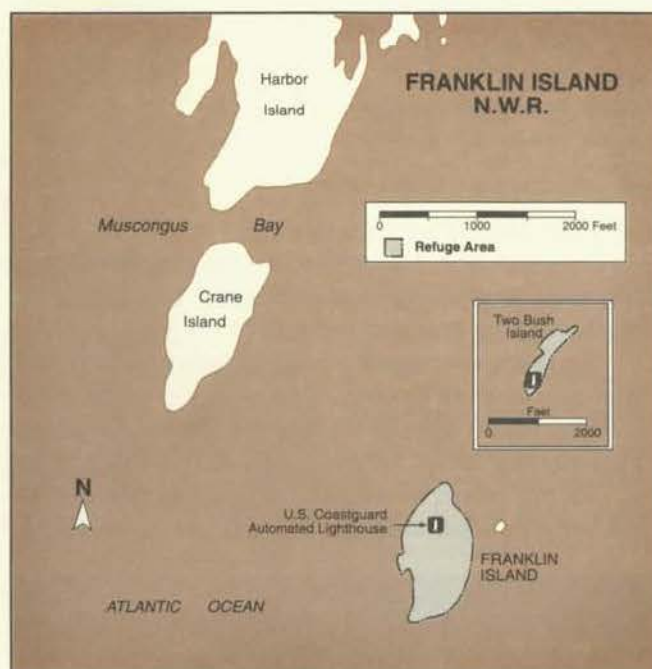
*Cross, Mink and Scotch Islands* are forested with dense stands of red and white spruce, balsam fir, yellow and paper birch and red maple. Rocky cliffs, some over 100 feet high, cobble beaches and salt marshes dominate the shoreline.

Cross Island has resident populations of white-tailed deer and furbearers as well as nesting bald eagles and osprey. Waterfowl, shorebirds and raptors stop here on their migrations. The Double Head Shots and Old Man Islands are covered with grasses and raspberry thickets, with some stunted red spruce trees. They are important for colonial nesting seabirds, attracting colonies of common eiders, Leach's storm-petrels, black guillemots, and double-crested cormorants. Old Man Island is one of only four nesting sites for razorbills in the Gulf of Maine.

## Franklin Island National Wildlife Refuge

Franklin Island NWR is a two-island complex totalling 20 acres. It includes 12-acre Franklin Island in Muscongus Bay, about six miles from the town of Friendship. Covered with spruce trees and raspberry thickets, the island has one of the largest common eider colonies in Maine with over 1,300 nests. Osprey and black-crowned night herons also nest here. The island was acquired in 1973 from the U.S. Coast Guard, which still maintains an automated lighthouse tower here.

*Two Bush Island* lies about sixteen miles east of Franklin Island and seven miles south of the town of Owl's Head. This eight-acre treeless island is owned by the U.S. Coast Guard which maintains an automated lighthouse tower. The Coast Guard leases the island to the U.S. Fish and Wildlife Service at no charge, so that we can protect and manage valuable seabird nesting habitat.





## Seal Island National Wildlife Refuge

Seal Island NWR is a 65-acre treeless island lying about 21 miles south of Rockland in Knox County. A bombing and shelling target from World War II until 1952, it became a refuge when it was transferred from the Navy in 1972.

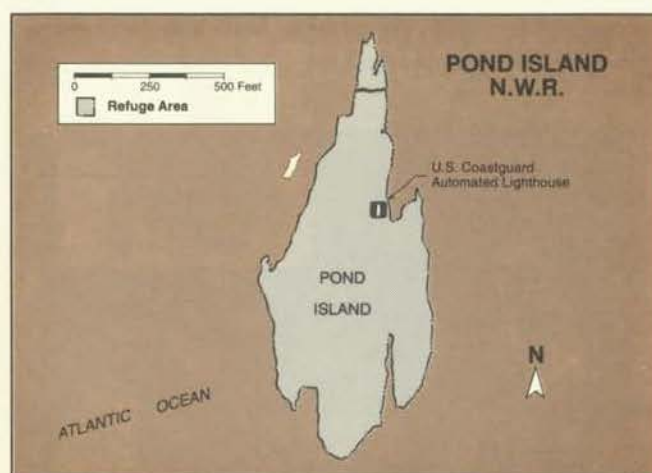
This remote grass and granite island offers prime seabird nesting habitat with boulder fields and ledges for puffins, razorbills and black guillemots; grass and ledge areas for terns; raspberry and grass thickets for eiders; and soft peat and glacial till soils for burrowing Leach's storm-petrels. As the name implies, harbor and gray seals frequent the island, attracted to the rich fishing grounds offshore.

Seal Island once had the largest Atlantic puffin colony in the Gulf of Maine. For over 200 years, however, fishermen used the island as a summer campsite while fishing for herring, groundfish and lobsters. They also harvested the nesting seabirds for meat, eggs and feathers, eventually wiping out the colonies by the late 1800s. Although herring and great black-backed gulls, common eiders, double-crested cormorants and arctic terns recolonized the island during the first half of this century, puffins never returned. Terns nested on the island as recently as the 1950s, but were crowded off by increasing numbers of gulls, a typical scenario repeated on many islands in New England. Seal Island is now the site of a joint project involving the U.S. Fish and Wildlife Service, the National Audubon Society, and the Canadian Wildlife Service to restore the puffin and tern colonies.

## Pond Island National Wildlife Refuge

Pond Island NWR is a 10-acre treeless island located about 16 miles northeast of Portland in the town of Popham Beach, Sagadahoc County. The island was acquired from the U.S. Coast Guard in 1973 which maintains a light-house and fog signal in the northern part of the island.

Vegetated with mixed grasses and shrubs it hosts a variety of colonial nesting seabirds including eider ducks, and herring and great black-backed gulls. It also provides habitat for migrating black ducks, teal, and Canada geese. In the early 1970s the area was identified for its value to nesting common terns and Leach's storm-petrels. Neither of these species have been observed since the early 1980s when nesting gulls took over the island.



© June Henshaw



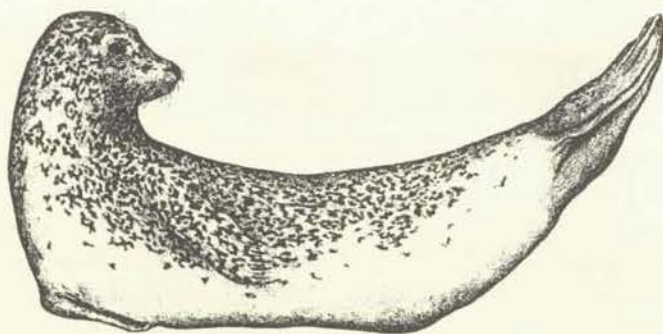
## Wildlife of the Coast

Refuge forests, grasslands, rocky outcrops, tidal wetlands and mud flats and the rich fish resources of surrounding waters attract wildlife throughout the year. Spring and fall migrations draw flocks of waterfowl, particularly black ducks, common eiders, goldeneyes and oldsquaws. Raptors and songbirds also use the islands to rest and feed during migration. Shorebirds feast on invertebrate animals in the marshes and mud flats, putting on fat to carry them on their long flight to South America.

Some migratory birds stay here in other seasons. Rafts of black ducks and eiders spend the winter feeding offshore and in protected bays. Songbirds, eiders and ospreys stay through the summer to nest in grass, thickets or trees. One special group of nesting birds is the seabirds.

The offshore islands, particularly treeless ones, offer valuable nesting sites for a great variety of seabirds. Common and arctic terns, endangered roseate terns, Atlantic puffins, razorbills, black guillemots, Leach's storm-petrels, laughing, herring and great black-backed gulls and double-crested cormorants all find prime habitat in which to raise their young. The islands are crucial to nesting success because they are usually free of mammalian predators and are surrounded by the ocean's rich fisheries resources for a food base.

Endangered species are a special concern. Peregrine falcons and bald eagles use refuge lands during spring and fall migration. Eagles also nest on remote, forested islands and overwinter here where they can feed on fish and carrion. Roseate terns nest with other terns on some of the grass-covered islands.



*Diana Dee Tyler*

Marine mammals also use this region extensively. Harbor seals are here throughout the year, using refuge and other islands for loafing, basking and giving birth to their pups. Gray seals are less common but are present year-round, usually on the outer islands. Harbor porpoises, finback and minke whales, and endangered right whales occasionally explore the bays seeking the rich supply of fish and invertebrates providing by ocean upwellings near islands and ledges.

On Petit Manan Point and some of the larger islands deer, bobcats, foxes, coyotes, porcupines, snowshoe hares, beaver and raccoons are common. Moose and black bear are also sometimes seen.

## Managing for Wildlife

Habitat protection is the most important management goal for these refuges, but refuge staff also actively manage certain areas and populations for key species in need of help.

Biologists monitor population trends and nesting success for many species.

On Petit Manan Point blueberry fields are burned on a three-year rotation to keep areas open for courting woodcock and to provide a food source for deer, whimbrels, ruffed grouse and a variety of songbirds. Hayfields are mowed periodically for similar purposes.

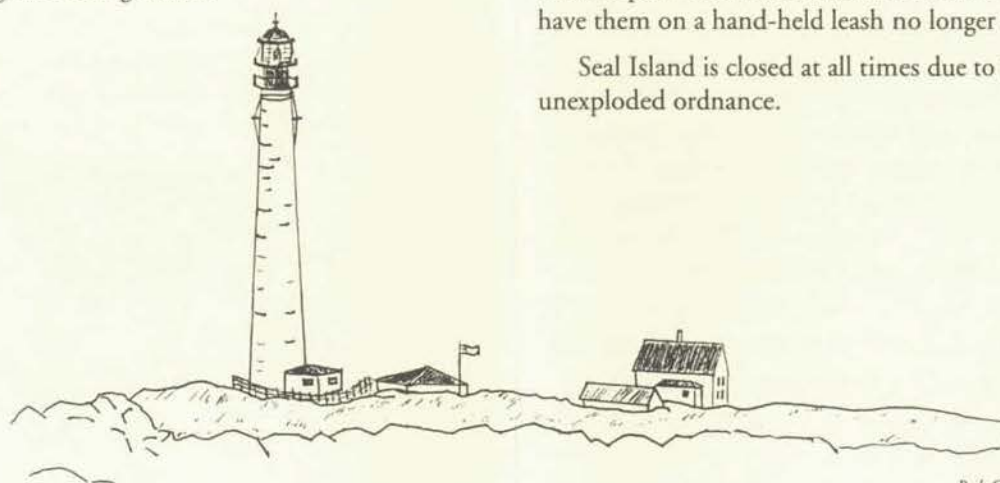
Some of the freshwater marshes on the Point are managed to provide optimum waterfowl habitat. The water level in former cranberry bogs is raised or lowered to create

additional food and nest sites. Nest boxes are placed in the marshes, providing safe, dry nest cavities for wood ducks and hooded mergansers as well as songbirds.

On the seabird nesting islands, herring and great black-backed gull populations are maintained at levels that reduce competition for nesting space for the less common species such as terns, laughing gulls, puffins, razorbills and black guillemots.

On Petit Manan Island, which has historically been one of the most important seabird colonies in Maine, growing populations of herring and great black-backed gulls displaced nesting terns and laughing gulls in the late 1970s. The refuge's seabird management program, which included removal of the nesting gulls starting in 1984, successfully restored the tern and laughing gull colonies. As a side benefit, a colony of Atlantic puffins also began nesting here. A similar program is underway on Seal Island, in cooperation with the National Audubon Society and the Canadian Wildlife Service. Puffin chicks were transplanted from Canada to restore a former colony and some nesting gulls were removed to prevent gull predation. Biologists used decoys and sound recordings to encourage terns to reestablish a colony. Nesting terns returned to the island in 1989. Nesting puffins returned in 1992, after a 105 year absence!

Some areas of the refuge must remain closed to visitors to protect nesting species and their habitat from human disturbance during the nesting season.



Beth Goettel

## Enjoying the Refuge

Petit Manan Point has two interpretive foot trails that offer visitors a chance to see and photograph wildlife in several coastal habitats. Birch Point Trail (3 miles round trip) is a gently sloping walk through blueberry fields and woods to the salt marshes on the northeastern corner of the point. The Shore Trail (1 mile, round trip) is a more rugged, strenuous hike that leads to the eastern shore of the point with views of several heaths and cobble beaches. To minimize wildlife disturbance we ask that you stay on established trails.

To enjoy the refuge trails, you can park in the small lot at the end of Pigeon Hill Road off U.S. Route 1 in Steuben. The Point is open from sunrise to sunset all year. Snowshoeing and cross-country skiing on the trails are good ways to see winter wildlife. For more information contact the refuge manager.

The island units in these refuges are accessible only by boat. Landing on the islands can be hazardous because of tides, currents and weather conditions. To protect nesting seabirds, which are very sensitive to human disturbance, all islands except Bois Bubert and Cross are closed to the public during the seabird nesting season, April through August.

For the safety of visitors and wildlife, camping, fires, firearms and motor vehicles are prohibited on refuge lands. Pets are permitted on the mainland trails as long as you have them on a hand-held leash no longer than ten feet.

Seal Island is closed at all times due to the danger of unexploded ordnance.



## U.S. Fish and Wildlife Service

Petit Manan 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  
Petit Manan National Wildlife Refuge  
P.O. Box 279  
Milbridge, ME 04658  
Telephone: (207) 546-2124

Hard of hearing or deaf visitors may call the Maine Relay Center at 1-800-437-1220 TDD/1-800-457-1220 voice.

This bird list was compiled largely through the efforts of a volunteer, Ralph Widrig. It summarizes literally hundreds of hours of daily, year-round observation and record-checking.



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

RL-53533

October 1994

# Birds

## PETIT MANAN National Wildlife Refuge



Milbridge, Maine

Petit Manan National Wildlife Refuge is a 5,125-acre complex consisting of five refuges on the eastern Maine coast. The refuges—Petit Manan, Cross Island, Seal Island, Franklin Island and Pond Island—include 14 islands and one mainland point. They are geographically distributed over 150 miles of coastline, as the gull flies, from Cutler to Popham, Maine. The headquarters for these refuges is located in the town of Milbridge. This brochure covers only Petit Manan National Wildlife Refuge.

Petit Manan National Wildlife Refuge is a 3,335-acre refuge consisting of portions of Petit Manan Point and Island in Steuben; Bois Bubert Island in Milbridge; and Nash Island in Addison. The refuge has a variety of habitats, including spruce and hardwood forests, jackpine stands, cedar swamps, raised peatlands, blueberry barrens, fresh and saltwater marshes, and coastal islands. This variety has made the Point a noted birding area for many species of seabirds, shorebirds, songbirds, waterfowl, and raptors, including the federally endangered bald eagle, peregrine falcon, and roseate tern.

The Point is accessible by car off U.S. Route 1 in Steuben, at the end of the Pigeon Hill Road. There are two unimproved trails that start at the parking lot near the information exhibits.

Because the seabird colonies are very sensitive to disturbance, access is restricted on Petit Manan Island and Nash Island during the nesting season, April 1st through August 31st. Please contact the refuge manager before attempting to visit these island units.



This brochure lists over 300 species that have been identified on the refuge, of which 103 are confirmed nesters and 15 are accidentals. This bird list is in accordance with the Sixth American Ornithologists Union Checklist.

Most birds are migratory, therefore, their seasonal occurrence is coded as follows:

#### SEASON

s	Spring	March – May
S	Summer	June – August
F	Fall	September – November
W	Winter	December – February

#### 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
x	accidental	out of normal range

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

s S F W

#### LOONS – GREBES

—	Red-throated Loon .....	u		u	
—	Arctic Loon .....	x			
—	Common Loon .....	c	u	c	c
—	Pied-billed Grebe .....			o	
—	Horned Grebe .....	c		c	c
—	Red-necked Grebe .....	c	o	c	c

#### SHEARWATERS – STORM-PETRELS

—	Greater Shearwater .....		r	r	
—	Sooty Shearwater .....	r	r		
—	Manx Shearwater .....		r		
—	Wilson's Storm-Petrel .....		o		
—	• Leach's Storm-Petrel .....	u	u	u	

#### GANNET – PELICANS – CORMORANTS

—	Northern Gannet .....	o	o	o	
—	Great Cormorant .....	c	o	c	o
—	• Double-crested Cormorant .....	a	a	a	r

#### BITTERNS – HERONS – IBIS

—	• American Bittern .....	u	u	u	
—	Least Bittern .....	r			
—	• Great Blue Heron .....	c	u	c	o
—	Snowy Egret .....	r	r		
—	Little Blue Heron .....	r			
—	Tricolored Heron .....		r		
—	Cattle Egret .....	r			
—	Green-backed Heron .....	r	r		
—	Black-crowned Night-Heron .....	r	r	r	

#### SWANS – GEESE – DUCKS

—	Snow Goose .....	o			
—	Brant .....	c		o	
—	Canada Goose .....	o		o	o
—	• Wood Duck .....	u	u	u	
—	• Green-winged Teal .....	c	c	a	
—	• American Black Duck .....	c	c	a	c
—	• Mallard .....	o	o	u	r
—	Northern Pintail .....	o	r	u	
—	• Blue-winged Teal .....	u	u	u	
—	Gadwall .....	r		r	
—	American Wigeon .....	o	r	u	
—	Canvasback .....		r		
—	Ring-necked Duck .....	r		r	
—	Greater Scaup .....	o	r		
—	Lesser Scaup .....	r		r	
—	• Common Eider .....	a	a	a	a
—	King Eider .....	r	r		
—	Harlequin Duck .....	r		r	

s S F W

—	Oldsquaw .....	c	r	a	c
—	Black Scoter .....	a	o	u	r
—	Surf Scoter .....	c	o	c	
—	White-winged Scoter .....	c	u	c	u
—	Common Goldeneye .....	c		c	c
—	Barrow's Goldeneye .....	r			r
—	Bufflehead .....	u		u	u
—	• Hooded Merganser .....	u	u	u	
—	Common Merganser .....	o			
—	Red-breasted Merganser .....	c	u	c	c
—	Ruddy Duck .....			o	

#### VULTURES – HAWKS – FALCONS

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

#### GROUND – QUAIL – TURKEY

—	Ring-necked Pheasant .....	r	r	r	
—	• Spruce Grouse .....	o	o	o	o
—	• Ruffed Grouse .....	c	c	c	c

#### RAILS – CRANES

—	King Rail .....		r		
—	Virginia Rail .....	r			
—	Sora .....		r	r	
—	American Coot .....			r	

#### PLOVERS – SANDPIPERS

—	Black-bellied Plover .....	c	c	c	r
—	Lesser Golden-Plover .....		o	u	
—	Semipalmated Plover .....	c	a	c	
—	Piping Plover .....	r	r		
—	• Killdeer .....	u	u	u	u
—	American Oystercatcher .....	r	r	r	
—	Greater Yellowlegs .....	c	c	c	
—	Lesser Yellowlegs .....	o	c	c	



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

#### JAEGERS – GULLS – TERNS – AUKS

— Pomarine Jaeger .....		r		
— Parasitic Jaeger .....	r	o		
— • Laughing Gull .....	c	c	c	
— Franklin's Gull .....			r	
— Little Gull .....			r	
— • Common Black-headed Gull .....	r	r	r	r
— Bonaparte's Gull .....	o	c	c	o
— Ring-billed Gull .....	u	u	c	u
— • Herring Gull .....	a	a	a	a
— Iceland Gull .....	u		u	u
— Lesser Black-backed Gull .....		r		r
— Glaucous Gull .....	r		r	r
— • Great Black-backed Gull .....	c	c	c	c
— Black-legged Kittiwake .....		o	o	o
— Gull-billed Tern .....		x		
— Royal Tern .....		x		
— Sandwich Tern .....		x		
— Caspian Tern .....	r			
— • Roseate Tern .....	u	u		
— • Common Tern .....	c	c	u	
— • Arctic Tern .....	c	c	u	

	s	S	F	W
— Least Tern .....		r		
— Sooty Tern .....		x		
— Black Tern .....	o	o		
— Black Skimmer .....		x		
— Dovekie .....		r		r
— Common Murre .....	r	r		
— Thick-billed Murre .....				r
— Razorbill .....	u	u		
— • Black Guillemot .....	c	c	c	u
— • Atlantic Puffin .....	u	u	r	

#### DOVES – CUCKOOS – OWLS – SWIFTS – HUMMINGBIRDS

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

#### WOODPECKERS – FLYCATCHERS

— Red-headed Woodpecker .....			r	
— Yellow-bellied Sapsucker .....			u	
— • Downy Woodpecker .....	c	c	c	c
— • Hairy Woodpecker .....	u	u	u	u
— Black-backed Woodpecker .....	r			
— • Northern Flicker .....	c	c	c	
— Pileated Woodpecker .....	o		o	o
— Olive-sided Flycatcher .....	o	o	o	
— • Eastern Wood-Pewee .....	u	u	u	
— • Yellow-bellied Flycatcher .....	u	o	u	
— • Alder Flycatcher .....	c	c	c	
— Willow Flycatcher .....	r			
— • Least Flycatcher .....	u	u	u	
— • Eastern Phoebe .....	u	u	u	
— • Great Crested Flycatcher .....	u	u	u	
— Couch's Kingbird .....			x	
— • Eastern Kingbird .....	c	u	c	

s S F W

## LARKS – SWALLOWS – JAYS – CROWS

— Horned Lark .....	r		c	r
— Purple Martin .....	o			
— • Tree Swallow .....	c	c	r	
— Northern Rough-winged Swallow .....	o			
— • Bank Swallow .....	c	c	r	
— • Cliff Swallow .....	c	u	o	
— • Barn Swallow .....	c	c	u	
— Gray Jay .....	o	o	o	o
— • Blue Jay .....	u	u	u	
— Black-billed Magpie .....	x		x	
— • American Crow .....	c	c	c	c
— • Common Raven .....	c	c	c	c

## TITMICE – NUTHATCHES – WRENS

— • Black-capped Chickadee .....	c	c	c	c
— • Boreal Chickadee .....	o	o	o	o
— • Red-breasted Nuthatch .....	c	c	c	c
— White-breasted Nuthatch .....	r		r	
— • Brown Creeper .....	u	o	u	o
— Carolina Wren .....	r			
— House Wren .....			r	
— • Winter Wren .....	u	u	u	
— Marsh Wren .....			r	

## KINGLETS – THRUSHES – THRASHERS

— • Golden-crowned Kinglet .....	c	c	c	o
— • Ruby-crowned Kinglet .....	c	c	c	
— Blue-gray Gnatcatcher .....	o	o	o	
— Northern Wheatear .....			x	
— Eastern Bluebird .....	o	o	o	
— Townsend's Solitaire .....			x	
— Veery .....	u	o	o	
— Gray-cheeked Thrush .....			r	
— • Swainson's Thrush .....	c	c	c	
— • Hermit Thrush .....	c	c	c	
— Wood Thrush .....	o		o	
— • American Robin .....	c	c	a	u
— • Gray Catbird .....	c	c	c	
— • Northern Mockingbird .....	o	o	o	
— • Brown Thrasher .....	u	u	u	

## WAXWINGS – SHRIKES – STARLINGS

— American Pipit .....	r		u	
— Bohemian Waxwing .....			r	
— • Cedar Waxwing .....	c	c	c	r
— Northern Shrike .....	o		o	o
— Loggerhead Shrike .....			r	
— • European Starling .....	c	c	c	u

## VIREOS – WOOD WARBLERS

— • Solitary Vireo .....	u	u	u	
— Yellow-throated Vireo .....	r		r	
— Warbling Vireo .....	o		o	
— Philadelphia Vireo .....	o	o	u	
— • Red-eyed Vireo .....	c	c	c	
— Blue-winged Warbler .....		r	r	
— • Tennessee Warbler .....	u	o	u	
— Orange-crowned Warbler .....	o		o	
— • Nashville Warbler .....	c	c	c	
— • Northern Parula .....	c	c	c	
— • Yellow Warbler .....	c	c	c	
— • Chestnut-sided Warbler .....	u	u	u	
— • Magnolia Warbler .....	c	c	c	
— Cape May Warbler .....	r		c	
— Black-throated Blue Warbler .....	u	o	u	
— • Yellow-rumped Warbler .....	c	c	c	r
— • Black-throated Green Warbler .....	c	c	c	
— • Blackburnian Warbler .....	c	c	u	
— Pine Warbler .....		o	o	
— Prairie Warbler .....	r	o	o	
— • Palm Warbler .....	c	u	c	
— Bay-breasted Warbler .....	o	c	c	
— Blackpoll Warbler .....	c	o	u	
— • Black-and-white Warbler .....	c	c	c	
— • American Redstart .....	c	c	c	
— Worm-eating Warbler .....	x			
— • Ovenbird .....	u	u	u	
— Northern Waterthrush .....	o	o		
— Kentucky Warbler .....	r			
— Mourning Warbler .....	r		r	
— • Common Yellowthroat .....	c	c	c	
— Hooded Warbler .....			r	
— • Wilson's Warbler .....	u	u	u	
— • Canada Warbler .....	u	o	o	
— Yellow-breasted Chat .....	r		o	

## TANAGERS – SPARROWS

— Summer Tanager .....	r			
— Scarlet Tanager .....	u	u	u	
— Western Tanager .....			x	
— Northern Cardinal .....	o		o	
— Rose-breasted Grosbeak .....	u	u	u	
— Blue Grosbeak .....	r			
— Indigo Bunting .....	r	r	r	
— Dickcissel .....			r	
— • Rufous-sided Towhee .....	u	u	u	
— American Tree Sparrow .....	u		u	u
— • Chipping Sparrow .....	u	u	u	
— Clay-colored Sparrow .....	r			

s S F W

s S F W

— Field Sparrow .....	o		o	
— Vesper Sparrow .....	o		o	
— Lark Sparrow .....		r	r	
— • Savannah Sparrow .....	c	c	c	
— Grasshopper Sparrow .....			r	
— Sharp-tailed Sparrow .....	r	o	u	
— Seaside Sparrow .....		r		
— Fox Sparrow .....	o		o	
— • Song Sparrow .....	c	c	c	r
— • Lincoln's Sparrow .....	u	u	u	
— • Swamp Sparrow .....	c	c	c	
— • White-throated Sparrow .....	c	c	c	
— White-crowned Sparrow .....	o		o	
— • Dark-eyed Junco .....	c	u	c	
— Lapland Longspur .....			o	
— Snow Bunting .....			c	o

## BLACKBIRDS – FINCHES

— • Bobolink .....	u	u	u	
— • Red-winged Blackbird .....	c	c	u	
— Eastern Meadowlark .....	o		o	
— Western Meadowlark .....		x		
— Yellow-headed Blackbird .....			r	
— Rusty Blackbird .....	o		o	
— • Common Grackle .....	c	c	u	
— • Brown-headed Cowbird .....	u	u	u	
— Orchard Oriole .....	r			
— Northern Oriole .....	u	o	u	
— Pine Grosbeak .....	o		o	u
— • Purple Finch .....	u	u	u	
— House Finch .....	r			
— Red Crossbill .....	o	o	o	o
— White-winged Crossbill .....	u	u	u	u
— Common Redpoll .....	u		o	c
— Hoary Redpoll .....			r	
— • Pine Siskin .....	u	u	u	u
— • American Goldfinch .....	u	u	u	u
— Evening Grosbeak .....	u		u	





**For more information  
about islands in the  
Gulf of Maine, contact:**

\*Acadia National Park  
(207) 288-5463 or  
(207) 288-3338

Audubon Society of New  
Hampshire  
(603) 224-9909

Maine Audubon Society  
(207) 781-2330

Maine Coast Heritage Trust  
(207) 729-7366

Maine Coastal Program  
(207) 287-3261

Maine Department of  
Conservation  
Bureau of Parks and  
Recreation  
(207) 287-3821

Maine Department of  
Conservation Bureau of  
Public Lands  
(207) 287-3061

Maine Department of Inland  
Fisheries and Wildlife  
(207) 287-2871

Maine Island Trail  
Association  
(207) 761-8225

Manomet Bird Observatory  
(508) 224-6521



Produced by the U.S. Fish and Wildlife Service  
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Gulf of Maine Project.



**Cooperators:**

Maine Department of Inland Fisheries and Wildlife  
Massachusetts Division of Fish, Wildlife, and  
Environmental Law Enforcement  
New Hampshire Department of Fish and Game

Massachusetts Division of  
Fisheries, Wildlife, and  
Environmental Law  
Enforcement  
(617) 727-0882

Massachusetts Department of  
Environmental Management  
(617) 727-3180

Massachusetts Audubon  
Society Coastal Waterbird  
Program  
(617) 834-9661

New Hampshire Department  
of Fish and Game  
(603) 868-1095

New Hampshire Division of  
Parks and Recreation  
(603) 271-3556

Petit Manan National Wildlife  
Refuge  
(207) 546-2124 or  
(207) 546-7805

\*Puffin Project/National  
Audubon Society  
(207) 529-5828  
(spring/summer)  
(607) 257-7308  
(fall/winter)

The Island Institute  
(207) 594-9209

The Nature Conservancy/  
Maine Chapter  
(207) 729-5181

**General  
Guidelines**

**T**here are thousands of islands in the Gulf of Maine that are not used by colonial seabirds and waterbirds for nesting. Nevertheless, it is also important to minimize your impact on these islands and their wildlife. If you plan to visit islands, please remember to:

- Contact one of the organizations listed to see if the island is open to the public.
- Keep all pets off the island.
- Never dump oil or waste overboard. Even small amounts of oil can kill birds and other marine life, and their habitat can take years to recover.
- Take everything you bring back with you. Seabirds often are hurt by eating plastic particles from trash that they mistake for food.
- In general it is best not to build fires, but if you do, build fires only below the high tide line and with a fire permit. Use only driftwood as fuel.
- Cut no live vegetation or standing dead trees.
- Be quiet or speak in a low voice.

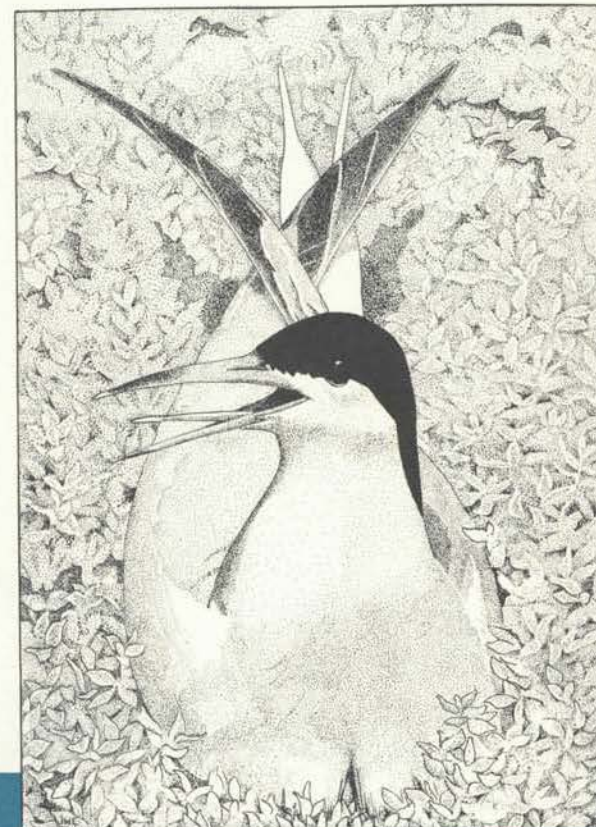


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Cover illustration: Common Tern, © Josephine Ewing

# ISLAND ETHICS

*Recognizing and Protecting  
Colonial Nesting Seabird  
and Waterbird Islands in  
the Gulf of Maine*



**A Guide for the Public**




# ISLAND ETHICS

## Special Island Residents Colonial Nesting Seabirds and Waterbirds

**T**here are more than 4,500 islands in the Gulf of Maine, where the coastal habitat of Maine, New Hampshire, and Massachusetts provides food for an amazing abundance of marine life. Today, about 500 of these islands are used for nesting by migratory birds known as colonial nesting seabirds and waterbirds; more than 400 of these are found off the coast of Maine.

Some of these birds, such as herring gulls and great blue herons, are very well known and are currently abundant. The roseate tern, on the other hand, is so rare that it has been listed as endangered under the protection of the Endangered Species Act. The popular Atlantic puffin, a colonial nesting seabird,



Great Blue Heron

has—along with the lobster—become one of the region's most recognizable symbols.

This brochure provides information about the lives of colonial nesting seabirds and wading birds and explains why your help is needed to ensure that they continue to prosper in the Gulf of Maine. With information, consideration, and restraint during their nesting season—a critical part of their year—we can all help protect these birds and the habitat they need to survive.

Although most colonial nesting seabirds in the Gulf of Maine spend the majority of their lives in the air or on the water, nesting islands are essential to their survival. Each year, the birds establish nesting colonies for breeding and raising their young. They usually prefer to breed on small, predator-free islands or ledges that are treeless—



either on bare rock or on ground that is grassy or covered with scrub plants like raspberries and wild roses.

Islands with these characteristics are extremely important for these birds and must be recognized and treated as special habitat. In many cases they support major breeding colonies and provide habitat for a diversity of species.

*Different species of seabirds and waterbirds use different nesting strategies on the nesting islands in the Gulf of Maine.*

## Seabird Life

**I**n general, colonial seabirds and waterbirds have long life spans (there is a record of a gull that lived over 30 years) and low reproductive rates (some of these species lay only one egg a year). Nesting populations fluctuate from year to year because of predation and changes in food supply and climate. Nest type varies from species to species, often allowing the same island to be used in several ways by several different kinds of birds.


Colonial birds tend to have small nesting territories and many pairs share an island when nesting. Nests in heron colonies, for example, can be spaced just "neck distance" apart from each other.

Although nesting in colonies allows efficient use of limited space for these birds and permits them to put up a common defense against predators (adults are known to mob predators) there are also serious disadvantages. Colonies are vulnerable to disturbance, habitat loss, and catastrophic events such as storms, disease, and oil spills.

The spring and summer seasons are especially important for colonial nesting seabirds. This is the time they court, mate, lay and incubate their eggs, and raise their young. Guillemots return to the same rock crevices each year, puffins and petrels re-use their burrows; eiders come back to the previous year's nest sites; and herons maintain the same stick nests in trees for many breeding seasons. In the Gulf of Maine, the nesting season lasts from April 1 to mid to late August. This is the time that state and federally-owned nesting islands in the Gulf are closed to visitors.




Black Guillemot



Double-crested Cormorant



Atlantic Puffin



Common Eider



Black-backed Gull



Common Tern



# ISLAND ETHICS

## Human Impacts

For hundreds of years, seabirds and waterbirds in the Gulf of Maine were exploited for meat, eggs, and feathers; later, nesting sites along the coast and on islands were disrupted by residential developments, pastures, quarries, and timber harvesting. The great auk, a flightless colonial nesting seabird once present by the hundreds of thousands in the North Atlantic region, was harvested to extinction in the early 1800s.

There were almost no marine birds left nesting in the coastal region of the Gulf of Maine by the beginning of the twentieth century. Concern about the loss of these birds contributed to the passage of the Migratory Bird Treaty Act of 1918. The Act enabled a gradual process of recovery among the populations of colonial nesting seabirds in the Gulf. At the same time, the changing economy forced people to abandon many islands, allowing seabirds to recolonize their former sites. Today, Maine's Penobscot Bay alone supports more than 26,000 pairs of nesting seabirds on more than 120 islands and ledges.

Many seabird nesting islands in the Gulf of Maine are owned and managed by state and federal conservation agencies and organizations such as The Nature Conservancy and Audubon Society. Private citizens own more than 200 of the nesting islands in the Gulf of Maine. These islands are private property and in many cases nesting birds return there because of the responsible private stewardship of the owners.

All species of colonial seabirds nesting on the islands in the Gulf of Maine are protected by the Migratory Bird Treaty Act of 1918. This protection extends to the birds' feathers, nests, eggs, and young. For example, it is against the law to remove or destroy a bird's nest or eggs.

## How You Can Help

In recent years, many of the seabird nesting islands in the Gulf of Maine have sustained increased use by private boaters, commercial tourist operators, picnickers, and fishermen. Many people are not aware that landing their boats, letting their pets run loose, walking across nesting areas, or even staying too long in one spot may cause birds to abandon nest sites or prevent parent birds from returning to their nests to incubate, protect, and feed their young.

Since many species of colonial nesting seabirds nest in hidden crevices, burrows, vegetation, or on top of exposed rocky ledges, a careless step could destroy a bird's eggs for that year. Even approaching the birds or letting dogs run near them can make them abandon their nests and young, or at the very least can cause them to use energy reserves for defense instead of incubating eggs and feeding young. Birds flushed from their nests leave eggs vulnerable to predation by other birds and by mammals, and exposed to often fatal damage from heat, cold, and rain.

Disturbing nesting seabirds during the nesting season (April 1 through mid to late August throughout most of the Gulf of Maine) is extremely harmful to eggs and chicks. People should stay off these nesting islands during this time and direct their activities to the many suitable non-nesting islands.

Colonial nesting seabirds often share rocky islands and ledges with seals. Even if you do not



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see the birds themselves, a sign that you are getting too close to the island is if you see seals moving back into the water. You are even too close if the seals begin to get restless. If you see seals plunging back into the water and leaving their pups behind, move away as quickly and quietly as possible. Human activities such as fishing and boating in the waters around nesting islands should be far enough away to prevent flushing birds from their nests. If flushed, some birds will actually cry out overhead or even attempt to dive at you in an effort to keep you away. Be sure to stay far enough away to keep this from happening.

There are many opportunities for recreation on other islands in the Gulf of Maine, including visits to state and federal parks. In addition, organizations like The Nature Conservancy, the Audubon Society, the Maine Island Trail Association, and local land trusts—as well as state and federal public land and fish and wildlife agencies—can provide lists and guides to nature-oriented activities such as seabird and whale-watching tours. (See the back panel of this brochure for a more complete list of organizations to contact.)

During the nesting season, colonial nesting seabirds and waterbirds need nothing more from us than peace and quiet. Your understanding and cooperation will help keep these birds coming back to share the Gulf of Maine with us.

## Major Groups of Colonial Nesting Seabirds and Waterbirds in the Gulf of Maine



**Terns**  
(Arctic Tern, Common Tern, Roseate Tern)



**Petrels**  
(Leach's Storm Petrel)



**Waterfowl**  
(Common Eider)



**Gulls**  
(Laughing Gull, Great Black-backed Gull, Herring Gull)



**Hérons**  
(Great Blue Heron, Black-crowned Heron, Night Heron)



**Cormorants**  
(Double-crested Cormorant)



**Alcids**  
(Razorbill, Black Guillemot, Atlantic Puffin)

(not drawn to relative scale)

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Human disturbance can frighten birds, make them abandon their nests, or leave eggs and chicks vulnerable to predators.

