

PETIT MANAN NATIONAL WILDLIFE REFUGE  
Milbridge, Maine

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 1993

U.S. Department of the Interior

Fish and Wildlife Service

NATIONAL WILDLIFE REFUGE SYSTEM

REVIEW AND APPROVALS

PETIT MANAN NATIONAL WILDLIFE REFUGE

Milbridge, Maine

and

Satellite Stations

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Margaret M. Anderson  
Refuge Manager

12-13-94  
Date

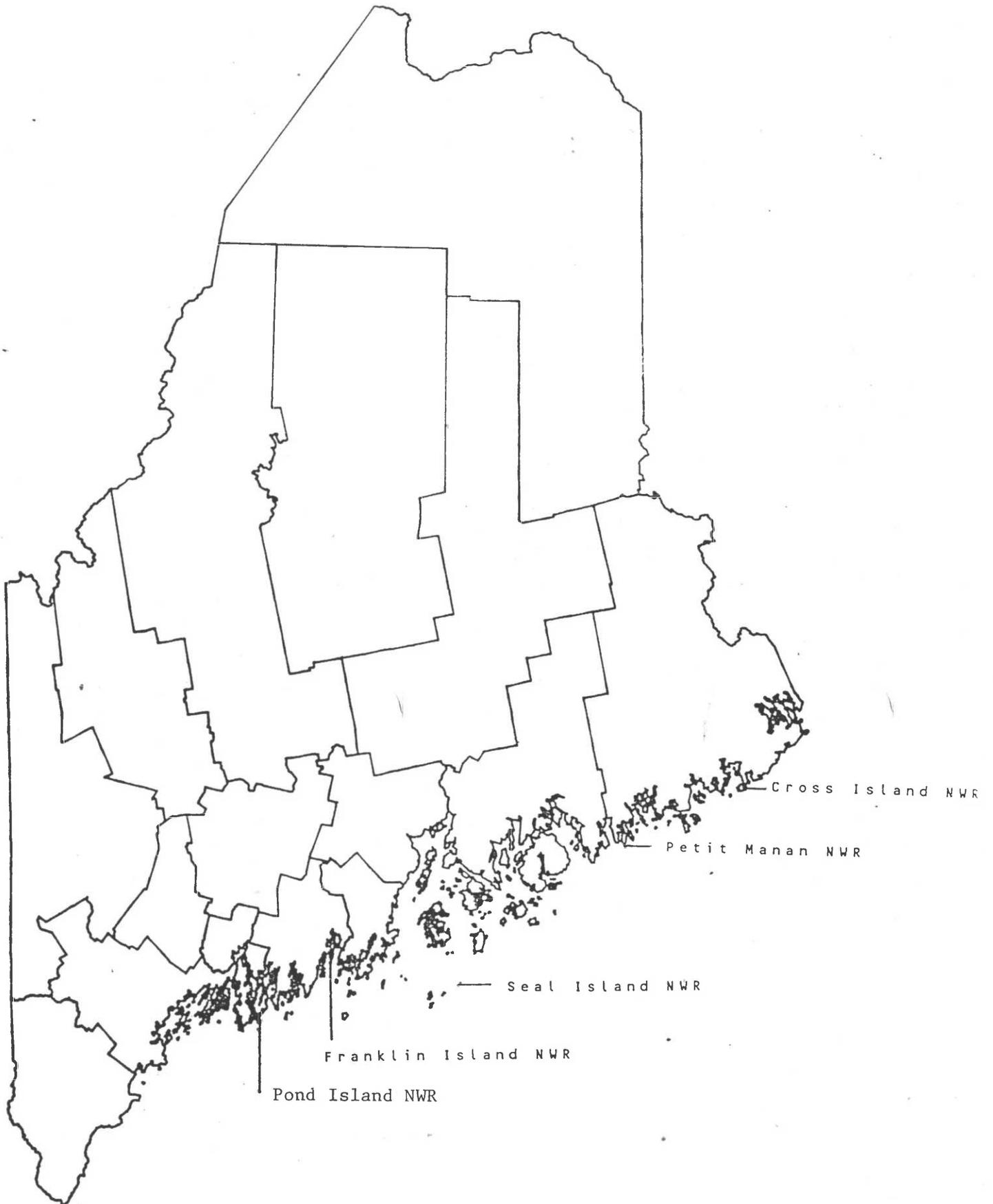
Donald N. Fepickie  
Refuge Supervisor Review

5-11-95  
Date

Donald J. Young  
Regional Office Approval

5-11-95  
Date

# Maine



PETIT MANAN NWR

PETIT MANAN NATIONAL WILDLIFE REFUGE

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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 3,368 acre refuge complex consisting of 2,166 acres on Petit Manan Point, acquired in 1975 and 1976 through the Nature Conservancy; 1,188 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; and five acres on Nash Island, transferred from the Coast Guard in 1983. The refuge is located in the towns of Steuben, Milbridge, and Addison, in Washington 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.

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.

**A. HIGHLIGHTS**

- \* **Maine State Essential Habitat designation for Roseate Terns approved; 21 islands designated - Section C.3.**
- \* **TNC Management Lease Agreement and RO Signature document for Approval of Tern Restoration/Gull Control on Ship & Trumpet Islands - Section D.4.**
- \* **3/13 "Blizzard of '93" - Section B.**
- \* **3/16 Machias Seal Island resurfaces - Section D.6.**
- \* **Harlequin surveys uncover 68 additional birds - Section G.3.**
- \* **5/12 Maine Coastal Islands PPP approved in WO - Section C.3.**
- \* **Drury Dedication 5/29 - Section E.8.**
- \* **20th Annual Natural Areas Conference - Section H.5.**
- \* **REO-LARC ranked Maine Coastal Islands/Focus Area III #2 Regional priority for RE in FY94. - Section C.3.**
- \* **Neal Sigmon, Marianne Lawler, Rob Shallenberger and Tom Dwyer tour refuge - Section E.8.**
- \* **Cranberry Dike Construction completed. - Section I.2. and F.2.**
- \* **PMI Boardwalk - constructed with help of International Volunteers - Section E.4. and I.2.**
- \* **COA and NAS selected for FWS Outstanding Contribution Award - Section E.4.**
- \* **New bird sightings - W. Tanager, Wheatear, House Wren - Section G.7.**
- \* **Schoodic Chapter of DU presents refuge with annual conservation award for Cranberry Marsh project. - Section J.2.**
- \* **Petit Manan Island Boathouse burned in preparation for new construction. - Section I.2.**

## 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.

The winter of 93' was relatively dry until the month of March. March will most be remembered for snow and lots of it. By months end over 40 inches had been dumped with snow falling on nine days. On March 6-7 we received a storm of 12 inches followed by the "Blizzard of '93" alias "Storm of the Century" which began on March 13th and ended the 15th. This storm produced accumulations of 18 inches of snow and winds of 80 mph offshore. These factors together produced blizzard conditions resulting in drifting snow and seas of 20-25 feet which further destroyed the already weakened boathouse on Petit Manan Island.



Luckily this truck was excess property! BB

Spring runoff raised the ground water level three inches higher than our basement floor. From April 25th until early May pumping became a daily ritual. The problem was solved with the installation of a sump pump.

On June 27th a weather station was installed on Seal Island by NAS crew. This station will finally give the refuge weather readings offshore and will be used for fire condition monitoring as well. Due to interference with the CB radio daily high and low temperatures were inaccurate. Next year, shielded wire will be purchased to solve this problem.

July and August were dry months with a total of only 2.14" of rain falling. Lack of rainfall in the area produced extremely high fire dangers unusual for coastal sections.

September rains brought an end to drought conditions with 6.58" falling during the month followed by 5.61" in October.

Until Christmas week, December was the warmest on record. Despite an average of 10°F for the last week of the month, Petit Manan Point still averaged more than 4 degrees warmer than the month of December, 1992. The flowages on the point did not ice over until the 24th, and Cranberry Marsh was consistently used by black ducks until ice-up.

A major storm with both high winds and heavy rains struck Downeast Maine on December 21st. Wind gusts estimated as high as 60 kts. topped and downed trees throughout the area. Two trees had to be bulldozed off the refuge road during the storm in order to keep emergency access open to inholdings on Petit Manan Point. High tides and surf created minor coastal flooding; all the major sea walls on Petit Manan Point were overtopped by surf and reshaped to some degree.

C. LAND ACQUISITION

1. Fee Title

Refuge and Realty staff continued to work on nine projects initiated in previous years and five projects in 1993. The Realty process is painfully slow, especially if a station does not have an 'approved' project boundary. Categorical exclusions must go through many levels within Realty, which lacks an effective tracking system. The Regional Office move further delayed the process as staff turnover was high and moral very low. Seeing a project to conclusion seems almost an impossibility, which is very frustrating to field staff, landowners, and realty, especially when timing is often a critical factor in whether or not a piece of land

will come under conservation protection. A more flexible and efficient process should be developed to allow the Service to enter into options or accept donations in a timely manner.

This year, as with last, the Senate Committee did not approve 1993 land acquisition funds for Petit Manan. The following is a summary of this years progress; only one project, an inholding, was purchased in fee in 1993.

#### ISLANDS

**Bois Bubert (inholding)-C.Huckins tracts, 33.4 acres:** Tracts 14,-I,-II and 17,-I, Milbridge, were acquired in fee in December. The following account is a summary of activities.

July: Realty notified refuge and owner in-holding funds might be available.

August: Level I-Contaminant Survey completed. Errors in property survey observed; the survey included portions of two neighbors' property.

September: Survey corrected; purchase option accepted.

October: Final Deed of Purchase written.

December 29, 1993: Recorded in Fee ownership at Washington Co. Registry of Deeds.

**Little Nash (inholding) - J.Cirone tract, 5 acres:** Half of this 10 acre seabird nesting island is owned by FWS. In August, a representative for the Cirone tract, Addison, requested copies of maps designating FWS boundaries. Taxes increased substantially this year on island properties in this town. The representative also requested materials on island stewardship and conservation.

**Metinic:** 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 80 acres, containing the tern colony, has been under negotiations involving FWS, Maine Department of Inland Fisheries and Wildlife, and Conservation Fund. The following is a summary of 1993 progress:

July: Level I-Contaminant Survey completed on 80 acre parcel. Purchase options were secured on two additional parcels bringing the number of acres protected to 104.

December: Title problems prevented 80 acre parcel from being acquired this year.

**Halifax:** This 75 acre island, located seven miles SW of Cross Island NWR has been under consideration for many years. A 1982 plant and wildlife inventory of the island was provided to Realty.

**Douglas Islands:** These five islands - West Douglas (13ac), Middle Douglas (24ac), Little Douglas (5ac), Turkey (.2ac), and Major's Head (5ac) are owned by a family group, the Pond Island Association (PIA). The islands lie east of and adjacent to Bois Bubert Island, Milbridge, most of which is in fee title. Over the past nine years the families, numbering 56, have discussed the fate of these islands. All of the islands support nesting osprey, there is one active bald eagles nest, a heron rookery, and seasonal use by harlequins.

In 1992, Chief of Realty, Bob Miller, Maine Coast Heritage Trust (MCHT), the Conservation Fund, and Manager Anderson met with the families at their annual board meeting to answer any questions or concerns about conservation ownership. The following is a summary of this years progress:

January: Letter sent to PIA members discussing what happens under FWS ownership in cases of divestiture, public use potential, development, etc. Refuge leaflets, NWRs leaflet, and the FWS/NWR mission and goals statements were sent.

April: FWS appraisal completed.

May-June: MCHT began working with PIA to develop an option. PIA requested a review of their by-laws to see if they allowed for sale or donation of islands.

August: PIA members voted to sell the 3 Douglas Islands only to the FWS with Conservation Easements in place.

October-December: Many meetings, letters, and phone conversations between all party representatives. At years end, everyone was working toward establishment of a purchase price for April of 1994.

**Ship, Trumpet, East and West Barge, and 10 acres of Bar:** This complex of islands, located in Tremont, Blue Hill Bay, is 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. A 1993 progress report follows:

January: Completed aerial flights for photo documentation and winter wildlife surveys. Began developing a lease agreement. RO-LARC approval requested.

April: Level I Contaminant Review and FWS appraisal completed.

May: Two-year management lease agreement signed, to allow for tern restoration efforts to begin while the details of the transfer were negotiated.



Ship and Trumpet Islands at low tide showing the expanse of shallow water area and connecting bar. BB

**Inner Goose:** This 5 acre island supports an active bald eagle nest. The owner contacted FWS in 1992, in the hopes of selling the island. At the same time, he was negotiating a donation of the island to Maine Coast Heritage Trust. After hearing the lengthy FWS process he donated the island to MCHT; which had been dealing with the landowner for years on behalf of the state. MCHT donated the island to Maine Department of Inland Fisheries and Wildlife.

**Thrumcap:** This 4 acre island in Damariscotta has been designated Essential Habitat for Roseate terns by the Maine Department of Inland Fisheries and Wildlife. Project Leader Fefer, Gulf of Maine Coastal and Estuary Project (GOMP), FWE, notified the refuge of a possible purchase of the island by a conservation group. Summary follows:

March: GOMP submitted proposal to LARC for review/approval.  
April: FWS appraisal completed. Meeting held between FWS, Damariscotta River Association and Maine Coast Heritage Trust (MCHT) to discuss seabird management.  
July: Level I - Contaminant Survey and wildlife survey completed. No evidence of nesting gulls or terns. Manager Anderson met with partial owners to discuss the RE process, options, life use, management, etc.

December: MCHT sent language for 'life-use' by one of the three family members for camping on the island. Refuge comments were provided; A.Larsen, RE, stated that this type of use would not diminish value of property.

**East Brothers:** This 23 acre island in Jonesport, is recognized as a seabird nesting island and historical area for nesting peregrine falcons. The Maine Department of Inland Fisheries and Wildlife owns West Brothers; the two islands are joined by intertidal flats. There are no structures; however, sheep graze the island yearround, and public use has increased.

July: Owners met with refuge to discuss FWS ownership and conservation options. Willing Seller Letter sent to RO.

December: 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.

**US Coast Guard 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. Maine Department of Inland Fisheries and Wildlife and the FWS became interested in cooperative management possibilities on Little Libby and Big Libby, which is owned by the state. Ted Dernago, RE Specialist, USCG was contacted in September to confirm USCG island ownership, discuss the possibilities of a management lease agreement or fee transfer on Little Libby, and possible fee transfer of the two islands currently under 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). This interest initiated a dialogue between both agencies summarized below:

October: Letter with PMN literature sent to USCG expressing interest in USCG excess islands, reviewing Two Bush 5 year lease agreement up for renewal 1/94 and USCG property acquired by FWS through the Transfer Act. **The USCG responded with interest and FAXed a list of islands for review.**

November: Mr. Dernago, FWS Realty staff, and refuge staff met in Hadley, MA. The USCG is looking at excessing a number of properties, with the proviso that any properties transferred or sold are under the condition that maintenance of all buildings, including lighttowers, will be new owners responsibility. All lightstations in Maine qualify for historic building considerations. This proviso is different from past transactions, where USGC maintained a sq. ft. fee area around towers, boat landings/ramps, and helipads, and maintained associated facilities. Mr. Dernago provided a list of properties for consideration for transfer. Anderson submitted a preliminary list (3 priority groups) of properties

FWS would be interested in. Annual maintenance cost, maintenance schedules, acreage, # of buildings, tower height, etc. were requested from Dernago. Realty Deed transfer descriptions from USCG to FWS on PMI, Nash, Franklin, and Pond Islands were sent to update USCG records.

#### MAINLAND

**Francis Wood DONATION:** F.Wood contacted the refuge in July 1991, interested in donating 40 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. At years end the owner still had not heard from the RO; in-spite of urgent and regular contact by refuge staff with realty. There was urgency on the owners part as well due to age and health considerations. The saga continued in 1992.

May: Manager met with K.Bentley, RE, and owner (a former legal secretary) to go over the final Deed of Donation. All was in order except a decimal # in regards to acreage on the survey map. Deed returned for correction.

June: Manager met with F.Wood; who had decided she would like a 150' access strip instead of 100' to property removed from the donation. Other concerns were sent to RO.

November: New deed sent to donor. K.Bently notified refuge that F.Wood wished to change the boundaries again (3rd time). This change was prompted by the failure of the inholding acres to pass a perk test. She also wished to include wording in the deed that would prevent the FWS from building any fences between the properties.

December: Manager met with donor and son to discuss modification requested to accommodate a septic system. Manager discouraged pursuing this, as it had potential to impact the integrity of the salt water marsh and the original intention of the donation. Mrs. Wood agreed not to pursue this modification. Donor's lawyer faxed wording to prevent building of structures to RO 12/26; K.Bently forwarded it to solicitor for opinion. Unfortunately, it was too late to complete donation in 1992.

**Francis Wood OPTION:** During negotiations on donated piece of property, F.Wood, indicated she would give a verbal, 2-yr, option to FWS for an adjoining piece of property. This piece is similar to the first with 2,500' of shoreline and extensive mudflats.

March: Memo sent to RO requesting action on 'option' property, as one year of the 2-yr option was almost up.

June: Department of Transportation (DOT) contacted refuge looking for mitigation sites for two projects scheduled in area; F.Wood property, along with several others, recommended.

October: DOT narrowed mitigation sites to two; F.Wood was preferred.

November: Unfortunately, a similar sized property was offered at a bargain price to DOT from TNC. However, DOT has the F.Wood property on a mitigation list for coastal projects. DOT in this state, is just beginning to get in the mitigation business and seem eager to work with FWS and Land Trusts.

**Petit Manan Point - Huntress Tract, 140 acres:** This coastal wooded property abuts refuge lands on Dyer Bay, Steuben. The property only has access by water, during low tide large expanses of mudflats precludes access. These areas are heavily used by migrating and wintering black ducks. The owner contacted the refuge in July. Information on the refuge and FWS land acquisition was sent. An on site meeting was scheduled in August, but canceled due to conflicts.

## 2. Easements

Petit Manan Point: Last year on 12-31-92 the refuge received a donated development easement from Paul Wehr. Although the Wehr property is only 15 acres with a small cabin; it could have supported three additional structures. Mr. Wehr, a summer resident, loves the point and its existing character. In March, he sent copies of his easement along with a letter describing his reasons for restricting his deed, cost, and procedure to five other inholders owning about 100 acres.

FMHA:William Rudelitch Easement On March 18th, RM Anderson and ROS Benedict met with Ron Joseph FWE to discuss a potential FmHA easement on the William Rudelitch property located across from the high school in Harrington.

March 21, Benedict met with Joseph and Machias representatives of SCS and FmHA to review the soils maps for the William Rudelitch property. The group met with Rudelitch and walked the Harrington property noting potential wetlands of importance and identifying two wetland restoration sites. Wetland alteration permits for both sites identified were discussed with Jay Clement COE and Wendy Rosier FWE.

On May 5th, Benedict met with Joseph at the property in Harrington to determine easement boundaries. It was suggested that the easement include a block of land along Rt. 1 containing two wetland drainage areas. One wetland contains an old dam that if restored would provide an excellent EE site for the Harrington High School directly across the street. The other drained area could be restored using a ditch plug providing excellent feeding habitat for black ducks. Four black ducks were seen flushing from the small wetland during a site visit.

On August 31st Benedict met with surveyors at the Harrington property to set boundaries on the FmHA easement. Agreement was reached to include two potential wetland restoration sites within the easement area.

R. Wittimore, DU, visited the site on 9/16. He was impressed with proposed restoration plans and committed a 50% DU match to the project; FWS - Partners for Wildlife will match at 50% also.

H. Cunningham: Several meetings, March through June, were held between Manager Anderson, Regional Woodcock Biologist Sepik, Bio.Tech Kitchens and land owner Harry Cunningham. Mr. Cunningham owns 300 acres which include wetlands, blueberry fields and forested uplands in Gouldsboro; excellent woodcock and black duck habitat. Portions of his property were field inspected, and management, covenants, easements, SIP/LAP programs, and potential easement holders were discussed. A land management plan was developed by Chuck Kitchens.

### 3. Other

Maine Coastal Islands NWR Preliminary Project Proposal (PPP): Realty submitted the PPP for this project in July 1992. There is supposed to be a six week turnaround in Washington for PPP review. In February 1993, a memo was sent to the RO requesting the status of the PPP; several land trust groups, Congressional staffers, and Maine Department of Inland Fisheries and Wildlife (MDIFW) were also interested in progress. The RO sent a status request to the WO in early March, which resulted in the PPP along with a cover memo being forwarded to the Director for signature March 19.

An O&M Cost Estimate for the PPP was prepared, May 3, for RO-RE submission to WO. The estimate was based on an assumed acquisition of 30 islands. Jeff Haskell, chief of RE-WO, called May 11 to clarify O&M expenses. The PPP was finally approved, May 12, after 9 months in the WO.

In an effort to keep up momentum a planning session was held, June 30, in the RO. Manager Anderson, Associate Manager Frickie, Dick

Dyer and Tom Goettel of the North American Joint Venture, and Chief of Realty Bob Miller, Carl Melberg, and Walt Quist from Realty attended. On July 1, Anderson presented a slide talk on the Maine Coastal Islands and Focus Area III project at the regional LARC meeting. This meeting was held to decide the FY94 priorities for Realty and rank all projects. The Maine Coastal Islands/Focus Area III ranked second in the Region!

Realty noted that the project did not rank high in the LAPS system in regards to endangered species. Endangered roseate terns, bald eagles, and peregrine falcons as well as harlequin and black ducks rely heavily upon these islands, intertidal areas and mud flats. This oversight was corrected by Coop Student Megyesi in the fall.

A land acquisition briefing meeting was held with the State September 7, in Augusta. In attendance were MDIFW - Gary Donovan, Pat Corr, and Tom Schaeffer, and FWS - B. Miller, D. Conner, and W. Quist, from RO-RE, M. Anderson, S. Fefer, and D. Dyer. Discussion centered around the Maine Islands Project and Focus Area III. MDIFW committed to share data/GIS information by December to incorporate into the environmental assessment. MDIFW was very supportive of FWS involvement in island protection; however, there was reservation about Focus Area III involvement.

On November 30 a strategy meeting was held in Portland with staff from regional realty, refuges, and North American Joint Venture, Gulf of Maine Coastal Project, and Petit Manan NWR. The status on progress on the Legislative Act, USCG islands, data collection from state for use in the environmental assessment, LAPS, ME Wetlands Coalition, acquisition funding strategies were discussed. Focus Area III was dropped from the project because MDIFW was not supportive of FWS involvement on the mainland points and coastal estuaries. This reluctance was based solely on the fear that traditional uses, such as hunting, may be denied to the public in the future on FWS fee owned lands. The FWS will continue to have trouble in areas of land acquisition if traditional uses can not be protected to a certain degree.

Island Development: FWS island protection proposal was not timely enough to afford immediate protection for **Jordan's Delight**. This 23 acre, spectacularly beautiful seabird nesting island with rugged cliffs, unique vegetation, and a natural stone arch was sold in April, to everyone's dismay. Located just northeast of Petit Manan Island, Manager Anderson had been in contact with the former owner to gain permission to census black guillemots, eiders, gulls, cormorants, and petrels. There were no permanent structures on the island, but sheep had been allowed on a yearround basis for the last five years. The former owner never stated he was interested in selling the island. Apparently the realtor he had bought the island from approached him to see if he was interested in selling.

The new owner was contacted to gain permission to land and census

birds. He stopped in the office on May 28 and was given a tour of Petit Manan Island by Tom Goettel in hopes that a sensitivity to nesting seabirds would be gained. The owner spoke openly of his plans to build a dock, small cabin for now, and eventually a larger home. He was concerned seabirds might thwart his future plans; however, he gave permission to census birds on Jordan's.

By years end many dramatic changes had taken place on one of Downeast Maine's most unique seabird islands. The sheep had been removed and a permit to build a "boathouse" was approved by the town. The boathouse ended up being a two story structure complete with woodstove, three walls of windows, and located on the edge of a cliff, 'ASL (not a very practical location, nor even in the realm of possibility, for landing a boat). A four-wheel track runs from the beach area to the building location. During the process a great deal of controversy ensued in the papers, including the Boston Globe, about loopholes in the zoning regulations that would allow the word boathouse to be used for a residence. The COE/DEP has, for the time being, denied the permit for a dock/pier.

A decent hurricane or one summer of nonstop heavy fog would do more to return this island to the birds than all the planning and zoning on the books. For the time being, the resource has lost one of the premiere islands. This one structure on an island near and dear to many galvanized the State's effort to complete the Natural Resource Protection Act ruling process for seabird nesting islands; which has been in the works for the last four years. In the mean time, hopefully, we can prevent this from happening to other important islands.

Gulf of Maine National Fish and Wildlife Refuge Act: Support for a legislative act to protect Gulf of Maine habitat important to wildlife was initiated in 1990 in an effort to provide some kind of protection since boundary expansion efforts were moving slowly. In October, Manager Anderson met with Steve Keeley, author and supporter of this legislation, and former manager Goettel to discuss the possibilities of resurrection this effort. The Act was written similar to the Silvio Conte NWR Act. If passed the advantages would include funding, a flexible means for protecting areas that might fall outside of an 'approved' boundary, and protection of traditional uses. Another meeting was held in Augusta with ROS Benedict, Goettel and Libby and Jim Mitchell on November 23. Libby suggested that Tom and she go to Washington in December to meet one of Senator Mitchell's top aides.

National Resource Protection Act: This is legislation proposed by the MDIFW for State DEP ruling to protect seabird nesting islands. About 295 islands, 5,000 acres, have been identified for additional zoning regulations; all of these islands will be identified in the Maine Coastal Islands Project. Anderson attended a meeting on the proposal in December; Coop Student Megyesi provided written comments for consideration.

Congressionals: On March 25 Chief of Realty Bob Miller and Maine Refuge Managers met with staff from Senators Mitchell and Cohen and Congresswoman Snow's offices for the annual briefing on land acquisition.

Maine Wetlands Coalition: This is a group made up of representatives from all of the local land trusts, MDIFW, FWS Realty and North American Waterfowl Joint Venture, Moosehorn and Petit Manan NWRs, and Gulf of Maine Project. A meeting was held April 8, Sidney, ME. The group discussed how successful their cooperative effort on the **Cobscook Bay Focus Area** was over the last three years in spite of strong resistance by the Washington County Alliance, a "wise use" group. The group agreed a similar approach should be used with the Maine Coastal Islands Project.

Frenchman Bay Conservancy (FBC): Manager Anderson is a board member and serves on the Stewardship Committee for this local land trust. Monthly meetings were attended throughout most of the year. Arrangements were made for the FBC to host Regional Woodcock Biologist Sepik as a guest speaker in May. Sepik gave a slide presentation on woodcock management techniques and the SIP/LAP programs. Invitations were sent to four other local land trust, Eagle Hill Research station, and a local DU chapter. About 30 people attended with good representation from the local land trust groups.

#### D. PLANNING

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

Ship & Trumpet Tern Restoration/Gull Control: In February a memo was sent to the RO and was addressed to the RD through RW and FWE for signature approval of this proposal. Basic content of the memo was that the action is covered under the Roseate Tern Recovery Plan and a separate EA for gull control specific to these islands is not necessary.

3/10 received RO approval to proceed with Gull Control on Ship & Trumpet Islands; an EA specific to the site was not required. 3/19 A Section 7 Evaluation for the project was submitted to the RO; RO approved 3/25.

Petit Manan Boathouse: Plans for reconstruction of the boathouse were submitted 11 March to the Maine Historic Preservation Commission. Response received 17 March with two minor design revisions.

On 4 June Schick escorted Tim Morehouse to Petit Manan Island to review the site of the boathouse reconstruction. The design of the proposed boathouse was finalized on 16 June.

Cranberry Dike Project: 10/6 COE (Augusta, ME; Hartford, CT), MDEP, and Town of Steuben notified project completed.

Historic Buildings: **Cross Island NWR** - 11/18 A certified letter was sent to Maine Maritime Museum regarding the Cross Island Lifesaving Station. In essence the museum was notified that this was a "last call" for interest, and they needed to respond by 12/6 as to whether or not they were still interested in salvaging all or portions of the structure. They had never responded to Don Young's memo dated 6/6/91. The museum has gone through several directors since 1991, which has been problematic. 12/15 Received notice from Maine Maritime Museum stating they were not interested in saving portions of the station.

Metinic Island - 11/18 V. Rough and E. Witham contacted (phone & letter) Anderson and Conservation Fund regarding the old Foster homestead. They would like to see it preserved and feel strongly that it has historical significance. Originally the building was located on the highest point of the island, 78'. It was built prior to 1854 and is at least 125 to 140 years old. All that remains is the ell portion of the house which was moved in the 1930's by a team of oxen to its present location. Eugene Witham has placed plywood over the windows to protect the building.

## **5. Research and Investigations**

### **Cooperative Agreements:**

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

National Audubon Society - Five year cooperative agreement signed in April to continue seabird studies at Seal Island NWR.

Spencer-Famous Consultants - One year cooperative agreement signed in April to continue Neotropical Migrant study.

### **Investigation of organochlorine and heavy metal contamination in Arctic Tern chicks and eggs.**

In June Biologist Megyesi collected 11 Arctic tern eggs to determine the baseline level of organochlorine and heavy metal contaminants on Petit Manan Island.

In July Megyesi also collected 2 Arctic tern chicks on Seal Island NWR. One chick had a cross bill and died the day after it hatched, another chick from the same nest looked morphologically normal but also died the day after hatching. These chicks were sent along with the PMI eggs for baseline level testing for organochlorine/heavy metal contaminants. Results are expected back from the lab in the summer of 1994.

Petit Manan NR90- "Monitoring Colonial Seabird Populations and Reproductive Success in Terns Nesting on Petit Manan Island, Petit Manan NWR." Dr. John Anderson, The College of the Atlantic.

#### 1992 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.
- ▶ 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 G.I.S. database for Petit Manan Island, and explore possible extension of the database to other areas of the refuge.
  - ▶▶ 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 the banding program, placing federal bands on Arctic, Common, and Roseate tern chicks.
  - ▶▶ 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.

- ▶▶ Develop standardized techniques for monitoring prey utilization among the island's seabirds.
- ▶ Expand the flora for Petit Manan Island begun in 1992, including location and abundance of rare and endangered plant species.
- ▶ Monitor and endeavor to increase the number of Guillemots, Razorbills, and Puffins utilizing the island.
  - ▶▶ Rebuild and expand Puffin and Razorbill nest boxes.
  - ▶▶ Conduct daily censuses from the lighthouse tower of Puffins, Guillemots, and Razorbills loafing on Petit Manan, recording band numbers when visible.
  - ▶▶ Band Puffin and Guillemot chicks at the conclusion of the season.
  - ▶▶ Map active Guillemot and Puffin burrows.
- ▶ Record occurrence and approximate abundance of passerines on the island throughout the season.
  - ▶▶ Note any nesting or territorial behavior among songbirds, and develop a phenology incorporating usage patterns.
- ▶ 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 the initial gull control and seabird management program began in 1984, we have annually issued a contract to maintain and monitor the colonies. This year the \$5,500 seabird contract was again issued to the College of the Atlantic. The contract pays interns a small stipend to live on the island from when the terns arrive in May until they leave in August. An additional \$2500 Challenge Grant was awarded for guillemot and petrel monitoring.

The field crew this year consisted of John Anderson, Professor of Zoology, COA; Andrea Roberto, Kate Devlin, Research Associates, College of the Atlantic Island Research Center; and student interns Sarah Grantham, Michael Stevens, and April Taylor. A preliminary visit was made to the island May 26th. Researchers arrived on the island for the season on June 8th and departed on August 5th.



Healthy populations of Common Terns attract the more elusive Endangered Roseate Tern. BS

#### a. Terns

The seabird management program was initiated in 1984 with the goal of restoring the colony of arctic, common, and roseate terns to Petit Manan, which was historically one of the largest and most successful colonies in the Gulf of Maine. This is an especially interesting colony because it has traditionally been composed of roughly equal numbers of common and arctic terns. All other colonies in the Gulf are largely composed of one species. Petit Manan is close enough to the bays and estuaries to attract common terns, yet far enough out to sea to be ecologically considered an outer island and attractive to arctic terns.

The nesting terns had been passively, and in some cases, actively, protected by lightkeepers over the years. The rainwater collected from the roofs provided the only freshwater for the three lightkeepers and their families, and the presence of gulls was not tolerated since they had a nasty habit of loafing on the roofs and fouling the water supply. This may explain why the three main tern colonies surviving in Maine today are on lighthouse islands.

After Petit Manan was automated in 1972 the gulls took over the tern colony. By 1978 tern numbers had started to decrease and by 1980 there were no nesters left. They failed to nest again until we initiated the gull control program in 1984. Within two weeks after the third application of 1339 Gull Toxicant, the terns were back. Today their numbers surpass the historical numbers, and, most importantly, their production is consistently high.

This colony is also important because it includes over half of the roseate terns nesting in Maine. Roseates, which were placed on the Endangered Species List in 1988, increased to 65 pairs from 61 in 1993. Although only roseates are officially endangered, we are concerned about all three species of terns because their populations have declined drastically since the 1940's, largely due to competition from gulls. It will take more active management programs at other colony sites to reverse this long-term decline.

The 1993 nesting season appeared to be somewhat later this year than previous years. The first pipped egg was found on June 20, 4 days later than 1992, and 8 days later than 1991. An island-wide nest count began on June 12th and concluding on June 15th revealed 1821 total tern nests. A Lincoln Index produced an estimate of sampling error of 5.8%, suggesting an island total of 1931 tern nests, up from last years estimate of 1804 nests. Total island numbers appear to have been relatively stable over the past three years. Species identification by observed incubation and/or chick feeding in a stratified sample of nests gave a ratio of 71% Common to 29% Arctic terns. This gradual shift in species ratio has been ongoing since the 1970's. It is apparent that the island has gone from a "primarily arctic" to "primarily common" colony over the past 20 years.

Generally the pattern of nesting continued to reflect a gradual redistribution of nests from the North and West of the island to the South and East noted in previous years. Tern fledging success was determined from chicks weighed and measured in three plots and observed from the lighthouse tower in a third. Survival to 15 days did not vary significantly between the four plots, so the results were pooled to produce a mean Common tern productivity of 1.1 chicks/nest and a mean Arctic tern productivity of 1.37 chicks/nest.

A detailed census of the island in mid-June revealed a total of 65 Roseate tern nests up from 61 in 1992. Mean clutch size was 1.38

with chick survival to 15 days was 1.22 chicks/nest. Roseates generally nested in dense vegetation or under piled driftwood along the periphery of the island, but at least three pairs nested in open heathland on the north of the island. A potential hybrid Roseate/Common tern pair was observed on the North end of the island and a second hybrid chick was suspected in late July.



Petit Manan is the northernmost stronghold for the Federally Endangered Roseate Tern. BS

Primary prey seen fed to tern chicks was herring (Clupea sp. although insects, marine invertebrates, hake (Urophycis sp.) and other small fish were observed. Patterns of chick growth in Arctic and Common terns were recorded again this year.

A total of 9 adult Arctic terns, 120 Arctic chicks, 58 adult Common terns, 417 Common chicks, and 48 Roseate chicks were banded. In addition 2 adult Arctic and 12 adult Common terns banded in previous years were recaptured.

#### b. Laughing Gulls

Petit Manan Island is also noted for having over half of the nesting laughing gulls in Maine. Fortunately, the laughing gulls do not compete significantly with the terns; minor predation on tern eggs and chicks has been documented on Matinicus Rock, but

never here. Kleptoparasitism has been documented here, but has had no significant effect. Their nesting habitat requirements are also very different from terns, as they prefer dense, tall vegetation, instead of the more open, rockier areas. Like the terns, they were roused from Petit Manan Island by the large gulls, and returned in 1984 when the gulls were removed.

Their preference for rank vegetation and nesting in 'tunnels' in the grass makes them very hard to census. There seems to be an association between laughing gulls and eider ducks. The density and height of the vegetation around the gull nests creates problems in movement for the gulls to/from the nests. The laughing gull nests are often made in anti-chambers off eider tunnels, and the gulls use these tunnels to move around in the vegetation. Whether the tunnels are entirely initiated by the eiders, or whether the gulls generate additional or new tunnels is unknown.

This years nest survey produced 505 active Laughing gull nests compared to 291 nests in 1992. Mean clutch size was 2.23 eggs/clutch.

Analysis of 44 samples of Laughing gull regurgitate revealed various insects in 21 (47%) of the samples, fish in 12 (27%), small mammals in 6 (14%) and shrimp in 5 (11%).

A total of 5 Laughing gull adults and 143 chicks were banded. Research Associate Kate Devlin took a special interest in laughing gull work again this year.

### c. Black Guillemots

Black guillemots are one of the rarest alcids, but are very common here in Maine. Guillemots seen loafing along the shoreline were counted from the lighthouse tower, with a maximum number of 258 recorded on June 14th. They nest in rock crevices and between small boulders and rocks, close to the water. In 1984, approximately 16 pairs of guillemots nested on Petit Manan. Since then this number has grown to over 100 pairs. A total of 134 active nesting burrows were observed compared to 150 nests last year. Primary prey seen carried by Guillemots was red rock eel (Pholis sp.).

Unfortunately, we do not have good populations numbers prior to 1984; however, since the only thing that has changed is a decrease in the influence that the gulls have on the islands, it is reasonable to assume that this dramatic increase is a result of gull control.

A total of 166 chicks and 27 adult Guillemots were banded in late July. Andrea Roberto has been working with these birds for several years now.

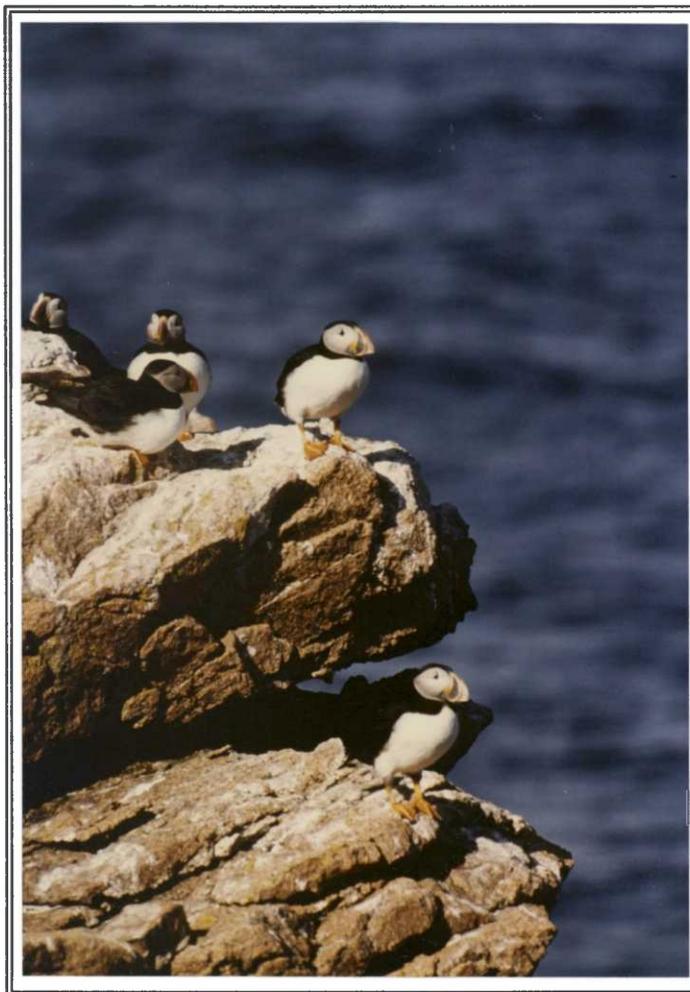


Petit Manan NWR and its satellites are the only refuges which are home to nesting Black Guillemots. B.S.

**d. Common Eiders**

Eider numbers on both Petit Manan and Green Island have increased since gull control. On Petit Manan eider nests have increased from 12 in 1984 to 75 in 1993. Average clutch size was 3.74. Eider nests were distributed widely all over the island, with one nest within 10 m of the station compound. The bulk of eider nests located were along the western edge of the island. In late July and early August adults of both sexes formed large mixed flocks of several hundred individuals over the ledges off the southwestern end of the island.

An estimated 200-300 eider nests were on Green Island. No systematic island-wide count was conducted this year due to the late arrival of the research team.



One of the unexpected benefits of gull control. BS

**e. Atlantic Puffins**

Until 1984 puffins had not been documented visiting Petit Manan. That year, up to 13 individuals regularly visited the island, loafing near the lighthouse, courting, and prospecting for nest sites. Puffins, like guillemots, nest in crevices and between rocks; puffins, prefer large desk-size boulders over the smaller, breadbox-size boulders that the guillemots prefer. Petit Manan does not have the boulder fields that the puffins colony islands do, so there is almost no nesting habitat, but what it does offer is a site free from gulls. Since the gull control, puffins have been regular nest prospectors on Petit Manan Island.

The population of Atlantic puffins loafing and nesting on Petit Manan continues to increase. This is particularly exciting and gratifying given the relatively low level of direct management intervention that has been required to develop a puffin population. Although puffins made use of the artificial burrows provided, they also found suitable crevices in the rocks along the East side of the island. The successful production of several chicks, coupled with a noticeable second peak of puffins late in August - a period when young birds are likely to be prospecting for future nesting sites - suggests that we may expect even greater numbers of birds next year.

Puffins (Fratercula arctica) were observed loafing on the Southeast point of the island throughout the season. Maximum numbers were recorded in June, with a high of 124 on July 9th. The average number of loafing puffins was 35. This is down slightly from last years average of 41 but significantly above the 1991 average of 20. A total of 12 nesting attempts were observed with three of these occurring in artificial burrows. Six chicks were banded with USFWS bands as well as red color bands.

#### **f. Razorbill Auks**

Razorbills were recorded on 40 of the 46 days of the field season, with a high of 37 in late June compared to a high of 27 in 1992. The average number of razorbills seen was 8.8. Although razorbills were frequently seen on or entering artificial burrows, we have no evidence of actual nesting attempts this year. Razorbills have yet to nest on Petit Manan. The increased numbers of birds seen loafing around the east point, and the steady lengthening of the period during which they are common suggests a more than casual interest in the island. We will be watching closely in the future for signs of nesting by this most exciting Auk.

#### **g. Leach's Storm Petrels**

Leach's storm petrels (Oceanodroma leucorhoa) were heard in the mid-to late evening throughout the season. A number of suspected burrows along the boardwalk were flagged in late July, and several of these were found to have chicks or eggs when the boardwalk was replaced in mid-August. Overall it seems unlikely that the island's petrel population exceeds 50 pairs.

Ship and Trumpet Restoration: In January, planning got underway to begin a tern restoration project on Ship and Trumpet Islands in Blue Hill Bay. Both islands are currently owned by The Nature Conservancy with hopes the islands will be sold to FWS in 1994. In March a Management Lease Agreement between TNC/FWS for Tern Restoration for Ship & Trumpet Islands was drafted. This lease agreement is an interim procedure to allow for tern restoration efforts to proceed in 1993 while FWS seeks acquisition funds.

Tern restoration efforts began in earnest during May. Under the supervision of Tom Goettel, RO-Biologist, 1339 gull toxicant was applied to 405 gull nests on 5/15 and 323 nests on 5/31. According to TG, we had an excellent treatment with a total of 383 gulls collected. This project has truly been a cooperative effort; field crews were made up of folks from College of the Atlantic, Maine Department of Inland Fisheries and Wildlife, The Nature Conservancy, Maine Department Environmental Protection, USFWS-RO, Moosehorn NWR, and Petit Manan.

There is strong evidence that an owl problem exists on Ship; 14 headless gulls were found and an owl pellet. During dead gull pickup evidence of owl scavenging was noted at Dodge's Pt. Marsh. Black-backed Gulls nesting on Eastern Barge were of concern to MDIFW and Tom Goettel; however, the permit did not include this island for application. Future permits will include the option for control of owls and Eastern Barge gulls.

Matt Drennan arrived on Ship Island on 3 June and stayed until 12 June to observe the response to gull control. A total of 85 gull nests were found of which 20 were cold eggs. It was estimated that approximately 100 Black-backed gulls and 240 herring gulls are still loafing in the area of Ship. Terns were observed in the vicinity of the island on June 3,4,5,9 and 11. Most appeared to be flying north over the island carrying fish. No landings were made on Trumpet to avoid disturbance to nesting eiders and their young. He estimated approximately 250 gulls loafing around the island.



Ship Island 1339 Gull Toxicant Application.

BB



Gull Control was truly a cooperative effort bringing together Nature Conservancy, College of the Atlantic, Maine IF&W, Maine DEP, RO staff, Moosehorn NWR, and Petit Manan. JA

Lymes Disease: Dr. Peter W. Rand, Lymes Disease Research Department, Portland, ME, contacted the refuge to discuss sampling neotropical migrants on islands to measure the degree they serve as carriers for the immature stage of Lymes disease carrying ticks. In October he conducted a tick survey of Petit Manan Point. His study is examining the movement and distribution of Ixodes dammini, LYMES carrier. Ample evidence exists showing the tick has made it this far with specimens collected from Columbia Falls and east along the coast as far as Calais. Despite numerous transects through various habitats he was unable to locate any ticks on the refuge.

#### Neotropical Migrant Cooperative Study

On September 26th Refuge Manager Anderson met with Norm Famous and G.Herrick, Roque Island, to discuss a Neotropical Migrant Cooperative Study between Petit Manan NWR, the National Park Service, The Nature Conservancy, Campobello Provincial Park and the Roque Island Association. Roque Island Association is willing to fund \$3,500 plus room and board over a three year period. Two additional meetings were held in October and November with the National Park Service and College of the Atlantic.

### Purpose

To establish a long-term population monitoring site for Neotropical migrant birds designed to:

- 1) monitor breeding population trends in selected habitat types,
- 2) evaluate productivity and survival trends, and
- 3) monitor migration trends.

Sorting out the factors affecting long-term population trends is, at best, problematic, especially in boreal ecosystems which, by nature, are subject to change. Habitat fragmentation, succession, land use changes, insect infestations, and climate are all variables. To minimize the influence of these factors, this study would be conducted in relatively stable spruce forests, bogs, and fens located on lands owned by the Fish and Wildlife, Park Service, Dept. of Defense, Maine Dept. of Inland Fisheries and Wildlife, Nature Conservancy, Maine Coast Heritage Trust, Roque Island Gardner Homestead Corp., and Roosevelt-Campobello International Park.

### 6. Other

**Machias Seal Island/ Charter Boat Captain Use Regulating:** 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.

In April, the refuge was visited by Deborah Bagg Gee and associate who wanted to look in our Machias Seal Island file. They were hired (gratis work) by a Canadian individual who felt the US Captains were a threat to the nesting seabirds. They were told to file a FOI request through the RD.

On April 23rd a meeting was held to address the 1993 Charter Boat Captain schedules. In attendance were Kevin Raye (Snow's office), Clyde McDonald (Mitchell's office), Don Carrington (Cohen's office), Charter Boat Captains Barna and John Norton, Andrew Patterson, Edwin Huntley, and FWS Haas, Hester, and ROS Benedict. The meeting lasted about four hours with little resolved other than

each captain stating their case for more landings. It was evident that the captains would not resolve the dispute among themselves and that it would be up to Haas to come up with a schedule based upon bookings to date and historical past use.

Draft access schedules were developed by Haas during the month of May based upon sea captains bookings and their comments. Benedict assisted by delivering schedules and meeting with captains to gather comments. The offices of Senators Cohen and Mitchell were contacted by two of the three captains regarding their dissatisfaction with the earlier draft schedules. Three offices of the State Department have been involved in this issue. A final schedule was reviewed by congressionals and the State Department for implementation on June 1.

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.

#### 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, Small Craft Operator, WG-9, PFT, EOD 4/18/88.
4. Jodie L. Kimmel, Office Assistant, GS-6, PFT, EOD 9/30/91.

Not Pictured:

5. Jennifer Megyesi, Coop. Biologist Trainee, GS-7, EOD 6/17/92, transferred in from Pacific Islands Complex.

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 89	1	0	3	5	5.6
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

Coop Student Jennifer Megyesi reported for summer duty on May 27 and returned to U Mass. to complete course work for her MS degree on August 24.

David Schick's position description was reclassified and he officially became a Small Craft Operator as of 10 June.

10/17 J.Kimmel was officially converted from Secretary (Office Automation), GS-318-5 to an Office Assistant, GS-303-6.

#### 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 33 volunteers contributed 3603 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.



International Volunteers for Peace worked with refuge staff for three weeks completing over 500 feet of boardwalk at Petit Manan Island. BB

In August, we were notified by Dick Smith, Acting Director, that National Audubon Society and College of the Atlantic were selected to receive the **FWS Outstanding Contribution Award** for their longstanding efforts on recolonization of colonial nesting seabirds at Petit Manan and Seal Islands. A spring ceremony will be held, preferably on one of the islands, to present these well deserved awards.

Kevin Keane began volunteering for the refuge in April. He is a carpenter by trade and also has had experience with trail work. His work during the year has involved rehabbing the parking lot display on Petit Manan Point, improving drainage along the upper portion of Birch Point trail, and keeping both trails brushed back.

During August, 11 International Volunteers for Peace assisted the refuge for three weeks in rebuilding over 500 feet of boardwalk at Petit Manan Island. The volunteers represented the countries of Germany, France, Ireland, Singapore, Spain, England, and Italy. The team endured long days, foggy weather, and the company of the foghorn to sleep and work by. The team contributed 480 volunteer hours during their three week stay.

## 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 89	122,621	61,471	6,700	45,831 <sup>1</sup>
FY 90	309,396 <sup>2</sup>	70,646	7,750	217,000 <sup>3</sup>
FY 91	225,768 <sup>4</sup>			
FY 92	221,221 <sup>5</sup>	74,981	21,750 <sup>6</sup>	108,716
FY 93	255,228 <sup>7</sup>	83,193	20,200	148,134

<sup>1</sup> Includes \$7,000 contributed from two private donors and \$16,000 grant from the Maine Historic Preservation Commission for Petit Manan Lightstation Rehabilitation.

<sup>2</sup> Includes \$2,000 EOY add-on for impoundment construction and \$17,000 for purchase of replacement vehicle.

<sup>3</sup> Includes \$14,500 grant from Maine Historic Preservation Commission for Petit Manan Lightstation Rehabilitation.

- <sup>4</sup> This year was a transition year with 4 individuals from two stations involved with the budget. Complete figures for other categories were not available.
- <sup>5</sup> Includes \$2500 for Coastal Wetlands Admin. and \$13,274 (Benedict on board and Megyesi reassigned)
- <sup>6</sup> Includes \$2,000 for rent and \$1500 for phones.
- <sup>7</sup> Includes \$3701 Challenge Grant National Audubon Society.

## **6. Safety**

In May, Seasonal Firefighter Barbara Pineau slipped and fell while working on the Shore Trail extension. The fall resulted in a bruised elbow and half a days work lost. No medical attention was required.

7/16 Benedict, Megyesi, Kimmel, and Volunteer Larry Anderson attended a 4 hour CPR refresher and 4 hour First Aid refresher held by American Red Cross at Moosehorn NWR. RM Anderson attended the 4 hour First Aid refresher.

9/16 An Annual Safety Inspection was held by ROS Siekaniec, MSH. Benedict conducted Sunkaze Meadows NWR inspection on 9/7.

Anderson, Benedict, and Schick received hearing tests on 8 December.

## **8. Other**

Jodie Kimmel completed two, one week tours of duty in the RO 1/11-14 and 1/25-29. She also spent two days, 1/15 & 16, helping out at Rachael Carson NWR.

3/10 Manager Anderson was a member of a 3 person panel discussing careers with 35 members at the Refuge Academy-Basic class; Charlestown, SC.

In April Reality Specialist Pam St. Pierre conducted an aerial review of refuge property as part of a periodic five year assessment review. All property was flown and photographed including island units from Pond to Cross. Schick and Benedict accompanied.

On August 11th the refuge hosted a tour for Neal Sigmon of Congressman Yates' staff, his wife, Marianne Lawler (Interior Budget), Chief of Refuges Rob Shallenberger and Acting DRD Tom Dwyer. The group visited Nash Island, Jordan's Delight, Petit Manan Island and Bois Bubert. The tour was conducted by Tom Goettel, David Schick, and Jennifer Megyesi.

Congressional Contacts: Managers Mullen, Sweeney and Anderson jointly met with Staffers in Cohen's, Mitchell's, and Snowe's Bangor Offices on 2/4. Status of Land Acquisition accomplishments and planning were of particular interest. The status of the Aquaculture facility off Cross Island, possible tern restoration and/or gull control on Ship & Trumpet, and the Bill Drury Dedication were discussed.

Bill Drury Dedication:

The dedication of the **William H. Drury, Jr. - Biological Research Station** occurred 5/29. The ceremony was held at COA and was part of a full day colloquium honoring Bill. It was a good move to hold the ceremony on the mainland as rain and high winds would have made an island presentation miserable. A total of 135 people participated, some from as far away as Alaska. The FWS key note speaker was David Weaver, WO-NAWMP. Other speakers were John Hay, author of several books (2 about terns) and collections of poems, and of the John Hay family who donated land for a refuge; John also contributed money to the restoration of the building compound on PMI and A. Hutchinson, MDIFW. Tom Goettel, who put a great deal of effort into writing text and artwork for plaque, and suggesting speakers, presented the plaque to the Drury family. It was an enjoyable day and the FWS effort was greatly appreciated by family, friends and colleagues of Bill. PAO and Mary O'Conner RO put together a nice Ceremonial handout.

Office - In October landlord Perry stopped in to notify us that there was a potential buyer for the office. Mr. Perry did say the potential buyer was interested in keeping FWS in the building. Contacted CGS, Dupois, to check on WO-status of 5-yr agreement and storage expansion request. 10/7 Dupois notified us that he found all paperwork for expansion signed by Lambertson. 10/9 WO had no record of receiving it. 11/3 Refuge staff met with John Walsh, Building Management Specialist GSA, to discuss the current office lease arrangement. Unfortunately the results of the meeting were relayed to the landlord in a very heavy handed way. Positive results included a cleaning schedule for the office and shoveling of snow.

11/15 MA met w/Dupois to check on WO status for approval of additional storage; he said "they" were walking it through, it should be resolved in a month, and there should be no problem.

**Training:** - the following is a list of training attended by refuge staff this year.

<u>Date</u>	<u>Training</u>	<u>Hrs</u>	<u>Attendees</u>
1/12-15	Supervisory Training	40	Benedict
1/17	CPR Recertification	4	Anderson
1/26-2/1	LE Refresher, Mirana, AZ	40	Benedict
1/26-27	DFC - Vendor Payments, Travel	4	Kimmel
3/26-4/4	Wilderness First Responder	80	Schick
3/29-4/2	LE Refresher, Patuxent WRC	40	Anderson
7/16	First Aid/CPR	8	Benedict, Kimmel, Megyesi
7/27-28	Oiled Wildlife Rehabilitation	16	Benedict
9/25	Oiled Wildlife Rehabilitation	8	Schick
10/19	LE - Drug Training	4	Benedict, Anderson
10/28	LE - Weapons Requalification	4	Benedict, Anderson
10/28	Fire Extinguisher Safety	4	Benedict, Anderson

## 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 May, Schick, Benedict and seasonal fire crew temporarily repaired a washout that had kept Cranberry Flowage drained since early spring. By month's end the flowage was approximately 3/4 full. The flowage was drained in June in preparation for the dike construction. Dike construction began on July 6th. Organic materials beneath the footprint of the dike were removed and trucked from the site providing the dike with a firm base. Rocks from the old stone dike were removed and placed forward of the dike to serve as riprap. A clay core was established to grade and slope incorporating a 30 foot emergency spillway and an 18" diameter water control structure. The dike face and emergency spillway were strengthened using geotextile fabric and the entire dike was

reinforced with a blanket of stone. Construction of Cranberry Dike was completed on August 9th. On the 23rd boards were placed in the structure with 4 inches of standing water accumulating by month's end.

In September, water levels at Cranberry Marsh had flooded approximately half of the newly vegetated flats. October rains totalling 5.61 inches returned Cranberry Marsh to full pool with nearly 2000 black ducks taking advantage of the restored water levels and wild rice crop.



Reflooding the rehabbed 70 acre Cranberry Marsh in preparation for the fall return of over 2,000 Black Ducks. BB

### 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.

## 5. Grasslands

Two former sheep pastures totalling approximately 10 acres are maintained for upland species by spot mowing when necessary. The lower hayfield was burned on May 7th. Burning conditions were good at the start but quickly the wind switched pulling in moisture from the surrounding waters cancelling the burn. We attempted another burn of the same field on the 10th with similar results.



A typical burn on Petit Manan Point - more smoke than fire. BB

## 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 new

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.

## 9. Fire Management

In March a combined purchase order was made out of Sunkhaze NWR for weather stations for both refuges. These stations will record wind speed and direction, temperature, humidity, barometric pressure, and precipitation. In addition, weatherlink software was ordered which enabled prolonged data storage and downloading to a PC. Petit Manan established the weather station at Seal Island to gather offshore weather data. Data was gathered throughout the season but interference from the CB system caused errors to show up in the records. Shielded wire will be purchased for next field season.

Annual prescribed burning was completed during May by staff from Sunkaze Meadows and Petit Manan. The following is a summary of burn units and dates.

Birch Point Parking Lot Field - 4 acre blueberry field - May 3  
 Meadow Brook Field - 2 acre blueberry field - May 3  
 Shore Trail Field - 3 acre blueberry field - May 4  
 South Birch Point - 4.5 acre blueberry field - May 5  
 Lower Hayfield - 4 acre hayfield - May 7 and May 10

Allan Carter and Rick Vollick performed a fire management evaluation at the station 9/21-22. The visit included a trip to Bois Bubert Island and Petit Manan Point as well as an office overview of other refuge holdings.

## 10. Pest Control

### Ship and Trumpet Tern Restoration/Gull Control:

Tom Goettel, RO-Wildlife Biologist, and licensed pesticide applicator supervised applications of 1339 Gull Toxicant. A gull census from the previous year indicated there were roughly 200 pairs of each species. Treatments occurred on 5/15 & 31. The following is a summary:

<u>Island</u>	<u>Date</u>	<u># of Gull Nests* Baited</u>			<u>Total</u>
		<u>Black-backed</u>	<u>Herring</u>	<u>Unk.</u>	
<b>1st application:</b>					
Trumpet	5/15	64	0	17	81
Ship	5/15	<u>133</u>	<u>46</u>	<u>145</u>	<u>324</u>
	<b>Total</b>	<b>197</b>	<b>46</b>	<b>162</b>	<b>405</b>
<b>2nd application:</b>					
Trumpet	5/31	12	13	43	68
Ship	5/31	<u>13</u>	<u>108</u>	<u>134</u>	<u>255</u>
	<b>Total</b>	<b>25</b>	<b>121</b>	<b>177</b>	<b>323</b>

\* Species nest id. determined by (finger-wrap) size of eggs;  
Unk.= empty nests.

<u>Island</u>	<u>Date</u>	<u>Summary of Dead Gull Pickup</u>		<u>Total</u>
		<u>Black-backed</u>	<u>Herring</u>	
Trumpet	5/17-18	34	6	40
Ship	5/17-18	75	65	140
Other sites	5/18	<u>22</u>	<u>20</u>	<u>42</u>
	<b>Sub-Total</b>	<b>131</b>	<b>91</b>	<b>222</b>
Trumpet	6/2-3	13	13	26
Ship	6/2-3	24	85	255
Other sites	6/2,3,4	11	15	26
	<b>Sub-Total</b>	<b>48</b>	<b>113</b>	<b>161</b>
	<b>TOTAL</b>	<b>179</b>	<b>204</b>	<b>383</b>

TNC was notified that PITA is offering a \$600 reward to anyone turning in areas/projects on TNC land involving any species control management.

(See section D.5.)

## 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

### 2. Endangered and Threatened Species

Bald eagles use the refuge throughout the year for feeding and loafing. Several pairs nest in areas adjacent to the refuge. Aerial displays by eagles were regularly seen in the spring near Cranberry Marsh and Meadowbrook.

On June 8th, Kimmel responded to a call of a dead bald eagle on Bar Island. The eagle was transported to the University of Maine at Orono for transfer to Special Agent Dick Stott. The eagle was then sent forward for analysis. 7/28 received the case report which indicated the bird died of electrocution - small burns were present on head, left wing and both feet. No lead was detected in the liver. The brain and liver tissue are being held for possible environmental contaminant analysis.

The Douglas Island pair fledged one eaglet on 7/22.

Peregrine falcons frequent the refuge during the spring and fall migrations, often preying on shorebirds and seabirds on Petit Manan Island. This year, the Peregrines visited Petit Manan Island throughout the nesting season, taking at least 12 adult terns. In addition, Acadia National Park staff reported finding the remains of at least one Guillemot at the falcon nesting site on Mt. Desert Island. The Acadia birds are the most likely candidates for the hawks seen over PMI. During June and July the falcons had established a regular schedule of visits appearing as often as three or four times a day.

**Roseate Terns:** 1/22 MDIFW approved Essential Habitat Designation for Roseate terns on 21 islands. Seal and Petit Manan Island were both on the list; all except four of the islands were in conservation ownership. This designation requires MDIFW review of all licensed permits (building, aquaculture). Islands under this protection will be given a 1/4 mile protection area from mean low water mark during the nesting season.

### 3. Waterfowl

During almost any month of the year, rafts of from 3,000 to 10,000 common eiders can be seen off Petit Manan Point and Island. Rafts of up to 15,000 have been reported during the late summer/early fall molt. With the eiders can be rafts of white-winged and black scoters and flocks of goldeneye, oldsquaw, bufflehead, and red-breasted mergansers.

The refuge's importance to waterfowl lies in providing habitat during the spring and fall migration. The freshwater marshes on the Point attract large numbers of black ducks, teal and other puddle ducks to loaf at high tide and feast on the abundant crops of leafy pondweed (Potamogeton foliosus), burreed (Sparganium angustifolium), bladderwort (Utricularia spp.), and wild rice (Zizania aquatica) in the Cranberry Marsh. At low tide the black ducks and teal can be found on the refuge's mud flats and saltmarshs.

Harlequin Duck Surveys - The eastern North American population of Harlequin Duck is estimated at less than 1,000 birds. The refuge assisted in identifying additional wintering sites previously not surveyed in coastal Maine. Schick and Benedict escorted Glen Mittelhauser on a harlequin duck survey of the Jonesport/Steele Head/Great Wass/Western Bay archipelagos on January 20th. The survey covered over 35 miles of island shoreline resulting in only one group of six harlequins at Freeman Rock. Conditions were well below freezing, but calm.

3/25 Schick, Benedict, and Mittlehauser surveyed potential harlequin habitat from Big Nash Island to Petit Manan Island. The results were Jordan's Delight-16, Petit Manan-8, and Majors Head-2.

In early April Mittlehauser and Schick surveyed the coast from Petit Manan Point to Schoodic Point. A total of 68 were sighted, with the predominant numbers found near ledges off the entrances to Dyer and Gouldsboro bays.

Wood Duck Nest Boxes - In March the wood duck boxes at Meadowbrook and Mague flowages were checked and cleaned. The only evidence of use was one wood duck feather in a box at Mague. Schick and Benedict checked the Cranberry Marsh wood duck boxes on April 9th. No activity was noted except what could be attributed to starlings

and swallows. Wood ducks had been in the area, however, as evidenced by the presence of feathers utilized in other bird's nests.

Black Duck Release - In May, Jerry Longcore, Patuxent Wildlife Research Center, released 29 hen black ducks on the refuge at Cranberry Flowage. These ducks were used this spring as decoy hens for an ongoing research project. They were captive bred, wild strain, and certified disease free by Patuxent veterinarians. The release proved to be a humorous experience as these birds took to flight for the first time.

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

Iceland and Bonaparte's gulls are usually seen in the fall and winter.

Great cormorants are commonly seen in the winter, replacing the common double-crested cormorants that winter in the Caribbean. Greats are now nesting in Maine and so are often seen in the summer months also.

Sooty shearwaters, common and thick-billed murres, parasitic jaegers, dovekies, black-legged kittiwakes, red and northern phalaropes, Wilson's storm-petrels, northern gannets, and common and red-throated loons are occasionally seen offshore.

Petit Manan staff completed the annual tern surveys from Schoodic Point to Cross Island June 14, 15 and 18. No nesting tern islands were observed in the survey area but feeding terns were observed near Outer Bar, Old Man, and Starboard Island.

A wide variety of shorebirds utilize Petit Manan Point and the offshore islands. These areas are critical stopover areas providing feeding and resting sites. Shorebirds begin arriving from their northern nesting grounds by mid-July with peak numbers in late August.

#### 6. Raptors

Each year tens of thousands of raptors pass over Maine's coastal islands and peninsulas during the fall migration. This years migration included flights of kestrels, broadwings, redtails, merlins, and sharp-shins.

Snowy and short-eared owls are sighted each year during the fall and winter months.

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

## 7. Other Migratory Birds

Nesting species of interest on the refuge include the boreal chickadee, Lincoln's sparrow, and 14 species of warblers, including the palm.

New bird species observed this year included the Western Tanager(#296), Northern Wheatear (#297) and the House Wren (#298).

Jordan's Delight: On June 28th, Biologist Megyesi surveyed Jordan's Delight after reports of shags doing poorly this year and in an effort to see the impact of sheep on the island which were removed on 26 June. During her visit she recorded a total of 147 nests containing 132 chicks and 164 eggs. The shag colony appeared to be healthy, though it is extremely vulnerable to predation by gulls if nests are left unattended. Leach's storm-petrels occur on the island as evidenced by the presence of burrows. An estimated 300 pairs of gulls inhabit the island making the island unfit for tern use.

## 9. Marine Mammals

Harbor seals and harbor porpoises are both frequently seen around the refuge units. Minke and finback whales, and gray seals are less commonly seen.

7/5 A Finback whale was observed off Pond Island, Milbridge.

## 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.

Otter and fox sign were noted on the flowages throughout the year. Fox sign was especially abundant in the fall. Consistent sign from a pair of coyotes was noted on Mague and Cranberry Marsh flowages.

Three beaver were much in evidence again this year harassing the water-control structure at Mague.

In December, Volunteer Keane identified tracks and scat of an adult Fisher in the Birch Point area of Petit Manan Point. The presence of this species was a recent historical first for the refuge.

## 11. Fisheries Resources

The impact of changes in the Maine fishing economy raises serious management concerns for the Petit Manan Refuge, and indeed for inshore management throughout the Gulf of Maine. Many species of

fish, clams, lobster, and sea urchins have been overharvested.

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.

**Aquaculture** - Atlantic Salmon Inc., has applied for another site off the Brothers and Big Libby. This has the State very concerned because of the large concentration of nesting eiders. Public hearings were held by Maine Department of Marine Resources in March at Jonesport and Machiasport. Atlantic Salmon Inc's president and lawyer began the hearings by providing background in their site selection process and proposed facilities. Testimony from Atlantic Salmon Inc. was followed by accounts from Intertidal Corp. who conducted the site evaluation and Norm Famous's testimony on the FWS report on the Cross Island facility. ASI attorney cited Famous's report throughout their presentation supporting the positive impact of aquaculture on bird life. Maine Department of Inland Fisheries and Wildlife intervened in both hearings noting the effect of disturbance on nesting seabirds. Unfortunately, there are few published papers on the effects of aquaculture on other wildlife species and most that have been done are from the west coast. Most concerns raised by MIF&W biologists were quickly refuted by ASI's sharp attorney. Local fisherman provided testimony on the quality of these sites for both scallop and lobster fishing noting these sites as "as good as you'll find Down East". USCG testified in the hearing for Big Libby and said they had no objection to the facility despite its location in a cable area.

One things for sure, these hearings are just the first of many on this topic. Atlantic Salmon Inc. is proposing to have four or five sites operational within the next five years. There is a strong need to begin a research project focusing on the effects of aquaculture including baseline data gathered prior to the facility going online.

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

On Petit Manan Island a total of 652 terns were banded. This includes: 9 adult Arctic terns, 120 Arctic chicks, 58 adult Common terns, 417 Common chicks, and 48 Roseate chicks. A total of 166 Guillemot chicks and 27 adults were banded. Six Puffin chicks were also banded. All were banded with USFWS Incoloy bands.

## 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. A Compu-Tech System's Road Counter and Censor was purchased in the fall to help evaluate these trends. In general, the use 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.

Birch Point parking lot display was rehabbed during April by Benedict, Kimmel, and Volunteer Keane. New plexiglass and a leaflet dispenser were installed on the display case. Volunteer Keane also worked on improving drainage along the upper section of Birch Point Trail.

### 3. Outdoor Classrooms - Teachers

RM Anderson initiated planning for an in-service training for teachers at Harrington Elementary School. She contacted State Project Wild coordinator, Lisa Kane, to finalize procedures for Teacher In-Service.

Earth Day was celebrated on May 1 at the Harrington Elementary School, sponsored by Nature Trail Committee. Activities and demonstrations included a continuous film festival, "Bart" the eagle from Moosehorn, paper making, recycling, shellfish aquaculture, earthball, a poster contest, nature trail walks, music and refreshments. Over 70 students and parents participated; which was an excellent turnout considering it was our first Earth Day, first sunny weekend, and we were competing with the first Little League Games and School Trips to the Circus. Next year we will schedule around these events.

Eagle Hill Research Station held an ornithology class (9 students) and censused the Shore and Birch Pt. Trails.

In July Eagle Hill also conducted a class (10) on Petit Manan Point in the Big Bog area. The class was headed by a botony professor from Michigan State.

### 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. Volunteer Keane upgraded both trails this year by improving drainage on traditional wet areas.

Manager Anderson worked with Harrington Elementary School Nature Trail Committee to design and order 10 interpretive signs for the nature trail to be located behind the school.

Seasonal fire crew assisted with the clearing of the Birch Trail Extension. This extension will convert the trail to a loop trail. Refuge Volunteer Keane also constructed cribbing at the trail head over traditional wet areas. Fire crew completed this project by laying wood chips in remaining wet spots.

### 5. Interpretive Tours

On June 24th, the refuge hosted a tour by the 20th Annual Natural Areas Conference. The Conference provided an opportunity for resource managers, scientists, students and volunteers to exchange ideas about identifying, managing, and protecting natural areas and endangered species. This years workshop focused on "Conservation in Working Landscapes." The group was divided in two with half of the group hiking Petit Manan Point and half touring the islands around Petit Manan. A total of 22 people attended the session.

#### Petit Manan Island Tours

<u>Date</u>	<u>Organization</u>	<u># of people</u>
24 June	Natural Area Conference	22
10 July	Schoodic Audubon	14
22 July	Moosehorn/Sunkhaze crews	6
26 July	John Hay	1

### 6. Interpretive Exhibits

In May an exhibit was produced entitled, **Scenes from the William H. Drury, Jr. - Biological Research Station**. Photos(22), 8'x12", were mounted on foam with text and velcro attached to a cloth exhibit panel (on loan from G.Marancik). The display was setup for the Bill Drury Dedication and, at the request of the college, left for graduation. A bronze plaque was received as a dedication memorial and will be placed on Petit Manan Island.

Interpretive trail signs were purchased this year; 10 of which were transferred to the Harrington Elementary School for use on their nature trail. The others will be added to the Birch Point and Shore Trails on Petit Manan Point.

Seabird Island Leaflet: In July RM Anderson met with Tatiana Bernard and Maine Department of Inland Fisheries and Wildlife staff Allen Hutchinson to discuss an outline for a leaflet that will inform the general public of how to identify colonial nesting seabird islands, periods of sensitivity, bird behavior, etc. The refuge will be paying for this through the Coastal Education Initiative Grant, \$1000. This effort will go a long way to educate the public to our needs and provide a visual reference of cooperation from several groups.

News Releases/Media Contacts:

<u>Media</u>	<u>Topic</u>
National Geographic	Seal Island NWR
Bangor Daily News	"
Downeast Coastal Press	"
Boston Globe	"
Maine Times	"
Atlantic Coastal Kayaker	Ship and Trumpet Tern Restoration
Atlantic Coastal Kayaker	Two Bush Island

**10. Hunting**

Two bucks were legally taken off inholdings adjacent to refuge property on Petit Manan Point. Signs of possible poaching activities were noted on at least four nights during the deer season.

**11. Wildlife Observation**

Approximately 75 people visited Petit Manan Island this year. The largest parties consisted of groups from the Audubon Society and the College of the Atlantic Champlain Society. There were also overnight visits by two professional photographers, and a variety of day visits by private citizens who arrived by motorboat, yacht, and sea kayak.

Prearranged parties of visitors were greeted on the boatramp and given a brief set of instructions regarding appropriate behavior, and then led up to the compound for a more formal talk on the history of the island and Maine coastal seabirds. Once completed, they were given the option of visiting one of several blinds. The lighthouse tower was off limits to visitors due to safety concerns. Puffins were far and away the most popular species with many visitors clearly content after viewing their first specimen. Unscheduled visitors were greeted at the boatramp were told about the sensitivity of island visitation and parted on good terms.



Schoodic Audubon enjoying a trip to Petit Manan Island. BB

### 13. Camping

Camping is generally not allowed on the refuge. However, it does occur, especially on the offshore islands. 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 MITA, 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. MITA must keep the site clean and make annual reports to the refuge manager.

During the months of July and August MITA use of Bois Bubert campsite totaled 18 visits. The sites were kept clean and no problems were reported during 1993.

## 17. Law Enforcement

On June 10th the students on Petit Manan heard shotgun blasts off Green Island. The pair of shooters apparently put their boat in at Shipman Point and began by shooting off Bois Bubert Island and then heading out to Greens. The shooters were protected by a dense blanket of fog which made identification impossible. PMI crew searched Green Island for signs of dead birds but none were found. A local came to the office to complain about the incident and promised to inform the refuge if the parties were in the area again.

On August 2nd, summer visitors to the refuge advised staff that a Jeep had proceeded beyond the lower gate on Petit Manan Point. The vehicle was later found parked at Bear Cove with the occupants off hiking. After nearly an hour three people returned and were found to be long time summer residents of Section 1 trying out their newly purchased Jeep. The group was informed about refuge regulations and information was taken from all involved. The information was forwarded to SRA Stott.

Also in early August, the information kiosk and brochure dispenser at the Birch Point parking area was vandalized and the parking lot rutted up by a vehicle doing "donuts". Damage included broken plexiglass on the kiosk and destruction of the dispenser - cost \$200. No leads have been uncovered to date.

SROS Benedict participated on the LE Committee in preparation for the 1994 Annual LE Refresher.

In November, Benedict, M.Sweeny, and R.Varney, Sunkhaze Meadows, met with Assistant U.S. Attorneys Woodcock, Wing, and Moore. Maine Drug Enforcement Agent P.Antoine introduced refuge personnel to the AUSA's as a get acquainted session. In addition, the group also toured the Bangor Drug Enforcement Office and equipment they would be willing to loan.

On 12/7, Sgt. Choate of the Washington Co. Sheriffs Dept. contacted the refuge in regard to illegal dumping of salmon. Atlantic Salmon Inc. had disposed of numerous salmon in an abandoned gravel bed near Addison. The fish had allegedly been poisoned and he was fearful that eagles would prey on the abandoned fish. Benedict made several contacts about possible poisoning and collected a fish from the site. Washington Co. Sheriffs will be pursuing the illegal dumping but the poison used to put the fish down was not found to cause secondary poisoning.

## I. EQUIPMENT AND FACILITIES

### 1. New Construction

Work commenced on a new building to house a composting toilet on Petit Manan Island. This fall the building site was cleared; sonotubes were set and concrete hand mixed, poured, and set to grade. Schick set in place the frame for the deck of the new building to house the composting toilet on Petit Manan Island on November 4th. Due to weather this project was shut down for the winter.

### 2. Rehabilitation

#### Petit Manan Island Boathouse



"When you're hot you're hot!" - Kimmel strikes a pose to save the newly constructed boardwalk from the intense heat. JM

The boathouse and ramp on Petit Manan Island suffered more damage during the "Blizzard of '93" storm. The boathouse has been rendered unsafe for use as a research blind and the boat ramp needed extensive repairs prior to the field season. Schick submitted plans for a scaled down boathouse replacement to Maine Historic Preservation Commission on 11 March. Plans with two minor revisions were returned on the 17th. Plans were then forwarded to K. Otting of Region 5 Engineering for review.

On November 23rd Schick and Kimmel leveled the east end of the old boathouse in preparation for burning the structure. This was done in order to help isolate the end of the boatramp from the fire. Fire pumps were transported to the island and stored.

12/1 produced a flawless day and a flawless burn for the destruction of the old Petit Manan Island boathouse. The operation resulted in a burn which was 98% clean but left the attached boatramp untouched by fire. Thanks to L.Anderson for volunteering to assist with the burn; and thanks to T. Siekaniec, and M.Depetta, Moosehorn NWR, who also assisted.

#### Fire Crew Projects

In May the fire crew spent three days clearing boundary lines and replacing faded signs on Petit Manan Point.

During June the fire crew cleared the fire road from the lower hay field to Big Pond, brushed the trail from Mague to the shoreline and constructed a pressure treated bridge over a wet area at the trail head, cleared the Shore Trail extension, cleared vegetation along Cranberry dike and drained Cranberry Marsh to ready for the Cranberry dike project. They also removed beaver debris from Mague Flowage, installed a beaver excluder device, and assisted Schick with replacing the decking on the Petit Manan Island boat ramp. The fire crew finished their assignment at Petit Manan on June 30th.

#### Cranberry Dike Construction

During the summer the refuge tackled the longstanding Cranberry Marsh Project jointly funded by FWS and Ducks Unlimited. This 70 acre wetland had an existing stone dike dating back to the turn of the century which was created to commercially raise cranberries. This venture failed leaving the dike maintenance up to the beavers who did a good job for years until the food resource was depleted. The past few springs the dike had failed leaving the wetland dry until a new group of beavers took over the task or refuge staff plugged leaks.



Century old stone dike at Cranberry Marsh prior to rehab. BB

Construction began on July 6th with the arrival of Thomas Siekanic, equipment operator from Moosehorn. The decision was made to remove the organic layer to clay or mineral soil prior to laying dike material. For two weeks organic layers were stripped and clay was hauled to fill the dike core. Earth was roughed out by 16 July with Schick completing final grading. Stones from the existing dike were placed along the dike face to serve as riprap. Temporary culverts were installed due to a contractor not meeting delivery date. Most of the rest of the month involved the supervision of setting stone to blanket the dike and setting riprap along the dike face.

The water control structure was installed on August 3rd with the concrete slab for the riser poured on the 4th. Cranberry Dike was completed on August 9th. Boards were placed in the structure on the 23rd. The water level was at full pool by the middle of October, just in time to greet over 2000 black ducks and 800 green-winged teal. A DU dedication is planned for next fall.



Schick compacting clay around Cranberry water control structure. BB



Laying stone over geotextile on emergency spillway. BB

### Petit Manan Island Boardwalk

Replacement of the boardwalk on PMI began on 9 August utilizing 11 International Volunteers for Peace. By months end, approximately 500 feet of walk had been torn up and replaced. Over nine tons of pressure treated lumber were transported to the island by barge, and then moved safely above tideline with human labor. Two young Leach's Storm Petrel chicks successfully survived the trauma of being disturbed while the old walk was torn up and the new one was constructed over their burrows.

Work continued on this project during the months of September and October to complete the last section. A portion from the compound to the lighthouse will be tackled with next years Volunteers for Peace.



Lighthouse view of boardwalk project in progress. BB

### Other:

Schick fished and equipped the "lost" Narraguagus River mooring with new 1/2" chain and a 1" pennant and pickup buoy.

The Petit Manan Point road was cleaned of surface boulders (several turned out to be well in excess of one ton) and graded on 4 Nov.. Four loads of gravel were also graded onto various portions of the road. Approximately six yards of gravel were placed on the Mague Dike road where overflow (due to beaver) had washed out the surface. - \$1,305 - Steuben Sand & Gravel.

#### 4. Equipment Utilization and Maintenance

##### Headquarters

To satisfy handicapped accessibility requirements, a door buzzer was installed at the foot of the wheelchair ramp outside the office in January. Costs were absorbed by the landlord. Additional lighting for the back office and rewiring of the bathroom light switch was completed.

Shelf space was reorganized in the basement and a locker for Schick was assembled on 12-13 Jan. Available storage space continues to decrease.

Beginning on March 25th, the basement needed daily pumping to retain a level below three inches. There was no sump pump installed and the drain (located at the highest floor elevation) was filling the basement rather than draining it. A boat plug was used to stem the flow from the drain but the continued rise in ground water kept staff on pump duty for three months.

The landlord visited on April 27-28 and contracted a local plumbing company to snake and then excavate the drain. The drain could not be opened or repaired until the ground-water receded.

The refuge basement flooding finally ceased after the installation of a basement sump pump by the landlord ending a three month headache.

7/20 Ed Perry, landlord, was up regarding sale of building and property. He had a 60 day option with the owner of Joshies fast food; the option expired 9/18. An updated memo to CGS was sent 7/21.

9/24 A much needed new Cannon NP2120 copier and stand arrived (\$2516).

##### Boats

###### **32' Workboat**

The 32' aluminum workboat alias "Old Sow" was prepped for painting by Washington Co. Vocational Technical School. The boat was

returned on June 21st. Paint compatibility problems prevented the hull from receiving its Awl-Grip coating this season. The cabin and bottom were coated to specifications. The boat was temporarily coated with a one-part epoxy for this field season and then Awl-Grip will be applied next winter.

#### **21' Boston Whaler**

The 21' Boston Whaler was received from Tri-Town Marine on 13 Jan. Work completed included installation of a new motor (155 HP) and related controls and gauges; fiberglass repair to the bow; and replacement of fastenings, hardware, and axles on the boat's trailer. Totals were \$1,404.15 for the boatwork, and \$828.93 for the trailer.

The 21' Boston Whaler was put into service on 23 June after Schick devoted 25.5 hours and Benedict 10 into installing a Coast Guard radio, bilge pump, batteries, and rigging and rewiring the boat.

#### **Skiff**

The skiff trailer was returned to Tri-Town for frame replacement under warranty on June 7th.

#### **20' Sea Ox**

The Sea Ox was brought to Tri-Town on the 16th for replacement of the carburetor which was dumping oil. Repairs were covered under warranty.

#### **Vehicles:**

The one ton Chevy pickup was rigged with a lumber rack by West's Fabrication in March.

Cellular phone capabilities were installed in 3 vehicles (Jeep, 1TPU, 3/4TPU) at a cost of \$300.

#### **Other:**

The 48" pipe and riser originally slated for Cranberry Marsh was loaded and transported to Moosehorn on 5 Jan..

A Compu-Tech System's Road Counter and Censor arrived (\$423) for public use monitoring on Petit Manan Point.

Moorings - Two moorings, one roughly 1800 lbs, and a second 5500 lbs were set off the east shore of Petit Manan Island on 9 August. This was done utilizing the barge which was transporting lumber to the island. Costs for the moorings and rigging, not including the labor to rig them, or the transportation from the shore to Petit Manan was \$1,574.

### **Surplus Property:**

The Ford 1/2 ton pickup was finally sold by GSA and turned over to the new owner on August 2nd.

### **5. Communication Systems**

Cellular phone capabilities were installed in 3 vehicles (Jeep, 1TPU, 3/4TPU) at a cost of \$300.

### **6. Computer Systems**

All the refuge software was cataloged and put into storage files. This completes this project, which was initiated last winter.

The IBM PC-AT received a new internal battery: 6 Dec. - Rivers Edge Computer - \$84.50. The Zenith 286 Laptop received a new display screen: \$284.00. Epson printer cleaned: \$70.50.

### **8. Other**

Close-up runs for Petit Manan Island were done on 25 Oct., 17 Nov., and 2 Dec.. Many thanks to L. Anderson who endured rough seas and obligatory seasickness to help pull tools off the island; and for helping with a variety of close-up chores. The island was officially put to bed after the boathouse burn December 2nd.

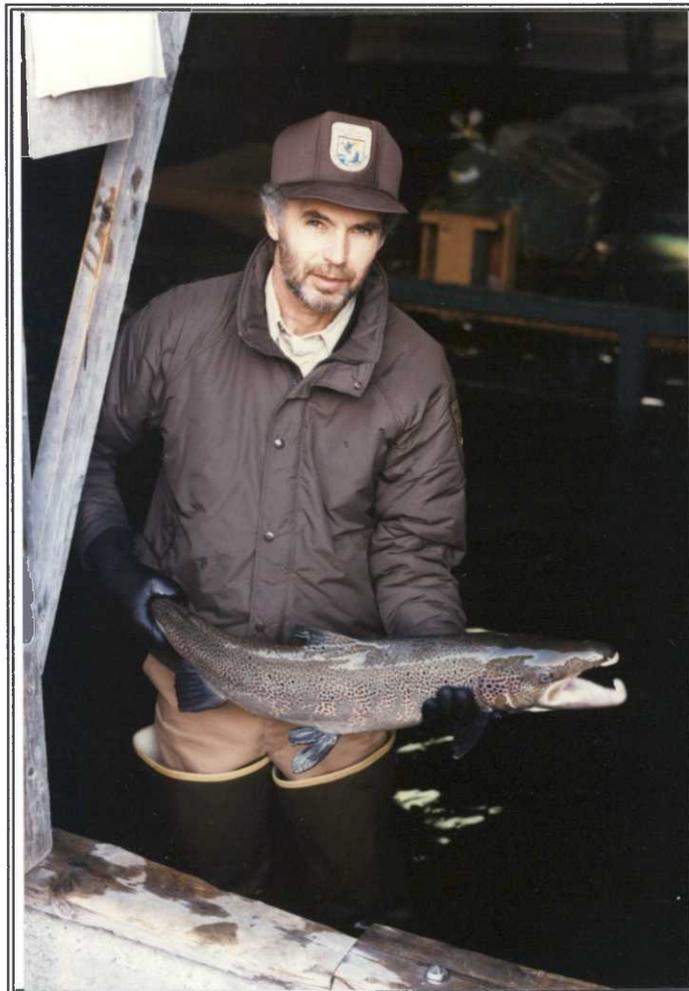
## **J. OTHER ITEMS**

### **2. Items of Interest**

10/2 DU Schoodic Chapter presented their annual Conservation Award to the Petit Manan NWR staff for their efforts on the Cranberry Dike at their annual Banquet. They also cited the cooperative spirit by staff in accommodating the chapter with their efforts to "video document" the construction. This project was initiated by former manager Tom Goettel, Anderson accepted on behalf of the refuge.

10/8,11,12 J.and M. Clark of the "Refuge Reporter" visited the refuge. They were given a tour of Petit Manan Point and of the local islands on a boisterous 25 kt. S.E. day. Hats off to both who endured, and enjoyed, a cold, windy, rough, and grey Autumn day in order to gain an understanding of the refuge's local environment and working conditions.

10/24 ten DU members, Schoodic Chapter, were escorted to Cranberry Marsh to view the newly constructed dike. Fortunately approximately 800 black ducks were on hand to provide a great show.



Petit Manan staff enjoyed assisting Craig Brook NFH with their annual Atlantic salmon spawning. Peter Burke holds a mature male ready for spawning. BB

Interdivisional Cooperation at its best: All Petit Manan Staff assisted Craig Brook NFH with salmon spawning; Anderson/Kimmel on 11/2, Kimmel on 11/4, and Benedict/Schick on 11/9. Not only were we able to lend a helping hand, but the camaraderie and days were great. We need to get together more on projects where we are out in the field or touching the resource.

Ducks Unlimited: Slides from the Cranberry Dike project were given to Phil Poux, Regional Director DU, for presentations in three state accomplishment meetings. Plans are also underway to include this project in a DU display which incorporates highlights of completions within the state.

Refuge Revenue Sharing: FY 1992 Revenue sharing checks were delivered to each town by hand or certified mail during April.

Town	Amount
Steuben	\$33,978
Addison	737
Milbridge	10,411
Friendship	729
Phippsburg	710
Cutler	16,535
Knox	1,391
Camden	47

#### 4. Credits

Anderson - A., C.1,2,3.

Kimmel - E.5.

Benedict - all others.

Photo credits: BB - Brian Benedict  
 JM - Jennifer Megyesi  
 BS - Bill Silliker  
 JA - John Anderson



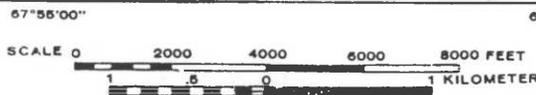
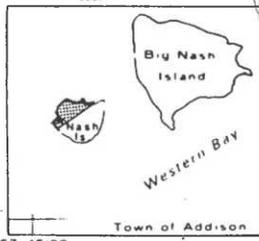
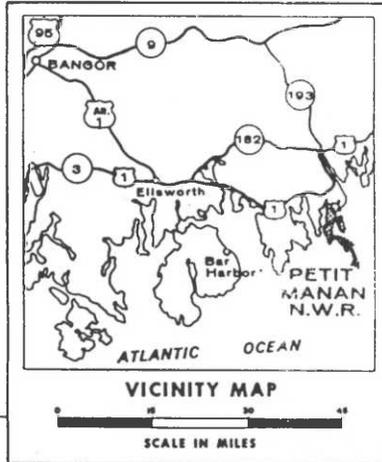
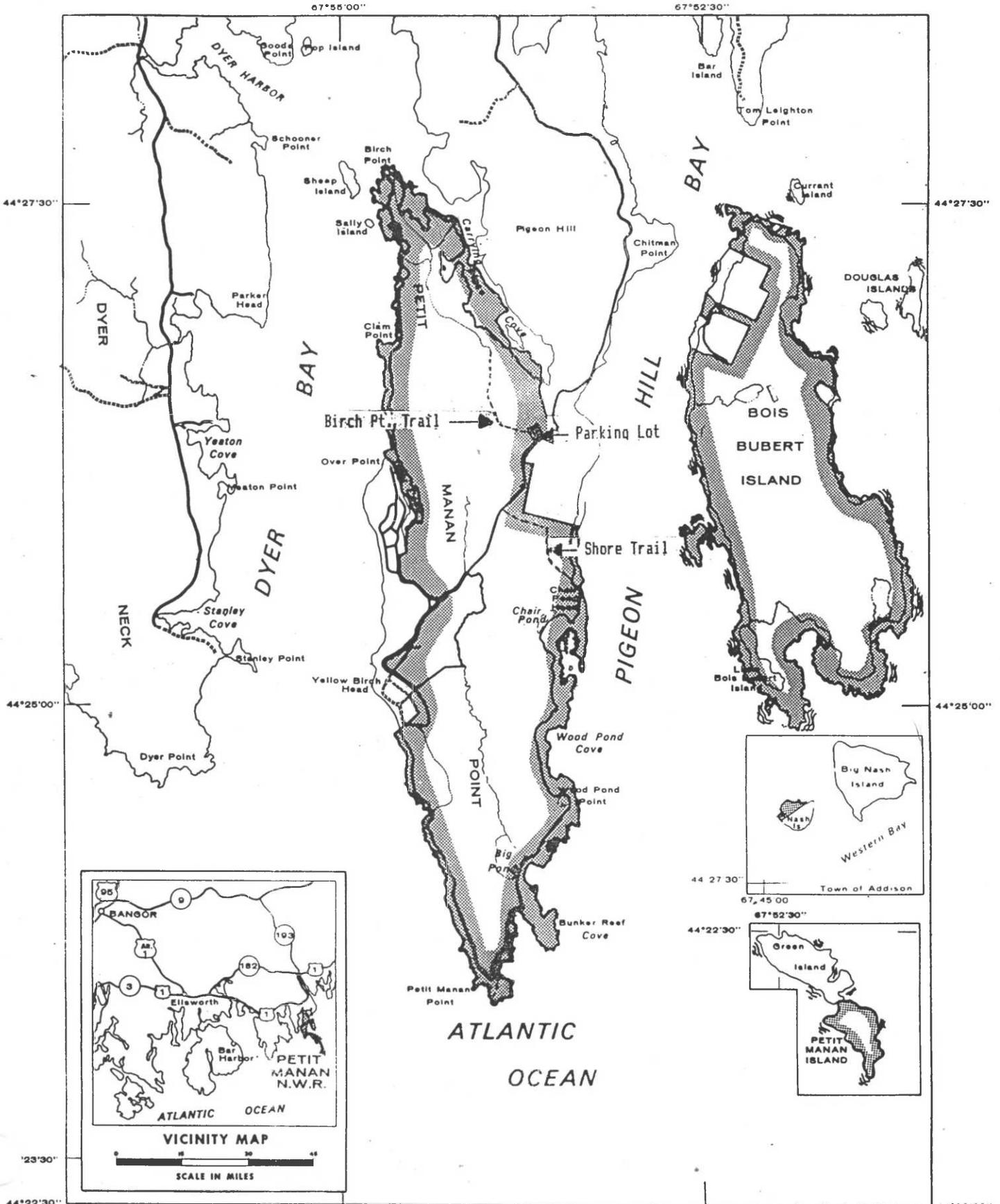
BB

# PETIT MANAN NATIONAL WILDLIFE REFUGE

UNITED STATES  
DEPARTMENT OF THE INTERIOR

WASHINGTON COUNTY, MAINE

UNITED STATES  
FISH AND WILDLIFE SERVICE



19 1/2" True North  
MEAN DECLINATION 1948

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

BOSTON, MASSACHUSETTS JULY 1974

CROSS ISLAND NWR

CROSS ISLAND NATIONAL WILDLIFE REFUGE

Cutler, Maine

ANNUAL NARRATIVE REPORT

Calendar Year 1993

## 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 known as the Avelinda Forest Preserve.

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 was scheduled for demolition this summer. This building 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. Staff made two visits to the site in 1992 to sign the area for safety and evaluate for burning. Burning is slated for early 1994.

### 5. Research and Investigations

Cross Island NR93 - An Evaluation of the Potential Impacts of a Salmon Aquaculture Facility on Waterbirds and Marine Mammals, Cross Island NWR, Cutler, ME Biological Technician Norman Famous, USFWS.

Biological Technician Famous was hired with funds donated by ATLANTIC SALMON (Maine), Inc., to document the effects of aquaculture operations (See Section G.11) on wildlife species using Cross Island. Development of the aquaculture industry is widespread in eastern Maine and the Canadian Maritimes. The ecological impacts of individual sites may be small. However, the potential for cumulative impacts exists. Human disturbance, fouling of the bottom at poorly flushed sites, nutrient enrichment of confined or restricted water bodies, entrapment of diving birds in anti-predator nets, accidental release of genetically inferior salmon stocks, and increased survival of juvenile herring gulls

have been sighted as potential negative impacts of aquaculture on birds. Beneficial effects include increased productivity at the local level, creation of artificial 'reef-like' environments, supplemental feeding for bald eagles and other fish/carrion eaters, and increases in benthic invertebrate populations.

The balance between negative and positive impacts is both delicate and site specific. Pre-development and post-development studies are needed to evaluate the ecological balance of a site. The objectives of this study were:

- to document existing waterbird and marine mammal habitat usage in the vicinity of an expanding aquaculture facility,
- to document pre-development waterbird and marine mammal populations at a proposed aquaculture facility,
- to document bird and marine mammal populations at a nearby ecologically sensitive area, and
- to document bird and marine mammal populations at a control site within the region (Roque Island \*).

\* Unfortunately, the study was initiated after the pens were already in place. Consequently, a control site had to be found. Norm began observations in April of 1991, and concluded his observations in July 1993. The following is a summary of the conclusions presented in the final report.

#### 1. 'Artificial reef effect'

The pens act as an artificial reef providing hanging mussel beds, small fish, and free swimming invertebrates available at all stages of the tide. Support for these observations come from the use of the pens and submerged cables by black guillemots during the breeding season and winter, as roosting and feeding areas for groups of common terns, and the use of antipredator nets and submerged wires/ropes by common loons, red-necked grebes, surf scoters, and common eiders.

#### 2. Scavengers attracted to pens

Scavenging by inexperienced first winter gulls increases survival to breeding age. Supplemental food sources near breeding colonies can also result in higher survival of young. These supplemental food sources for gull populations will be detrimental to other nesting seabirds because of great black-backed and herring gulls are the leading nest predators at colonial nesting seabird colonies in Maine.

### 3. Resting/Roosting and brood rearing areas

Terns bring broods to pens from August to mid-September. The predominant species was common tern. Herons and terns both rested and fed at the pens. Great blue herons frequented the metal pen areas and were associated with pens housing the smallest size salmon. Belted kingfishers rested and hunted throughout the pens and adjacent shorelines.

### 4. Increased prey for raptors

Bald eagles were observed pursuing gulls and waterfowl in the Northwest Harbor area. The pre-development numbers of waterfowl and gulls are unknown. Gull densities, however, were dramatically higher than in the Narrows area.

### 5. Potential for increased predation by gulls at nearby colonial nesting seabird islands.

First and second winter gulls were attracted to the pens during the season of highest mortality for gulls. The supplemental feeding will decrease mortality in young gulls which, because of their attraction to the pens, are likely to nest in the region. Their increased numbers pose a threat to other colonial nesting seabirds.

### 6. Disturbance effects

Negative impacts resulting from disturbance by day to day activities around the pens may have occurred to selected wintering waterfowl. This is probably more acute during and after the hunting season. Species which appeared to occur at lower numbers around the site included common goldeneye, bufflehead, and red-breasted merganser. Noise from generators and boat activities did not appear to be a disturbance factor at Cross Island. No net entrapments were observed or reported.

### 7. Species with no obvious trends and more analysis needed

No obvious trends were apparent for oldsquaw, common loon, horned grebe, Bonaparte's gull, and common eider.

## 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. See Section H-1.

### F. HABITAT MANAGEMENT

#### 1. General

At the present staffing level 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.



Saltmarshes on Cross provide black duck and shorebird feeding habitat. BB

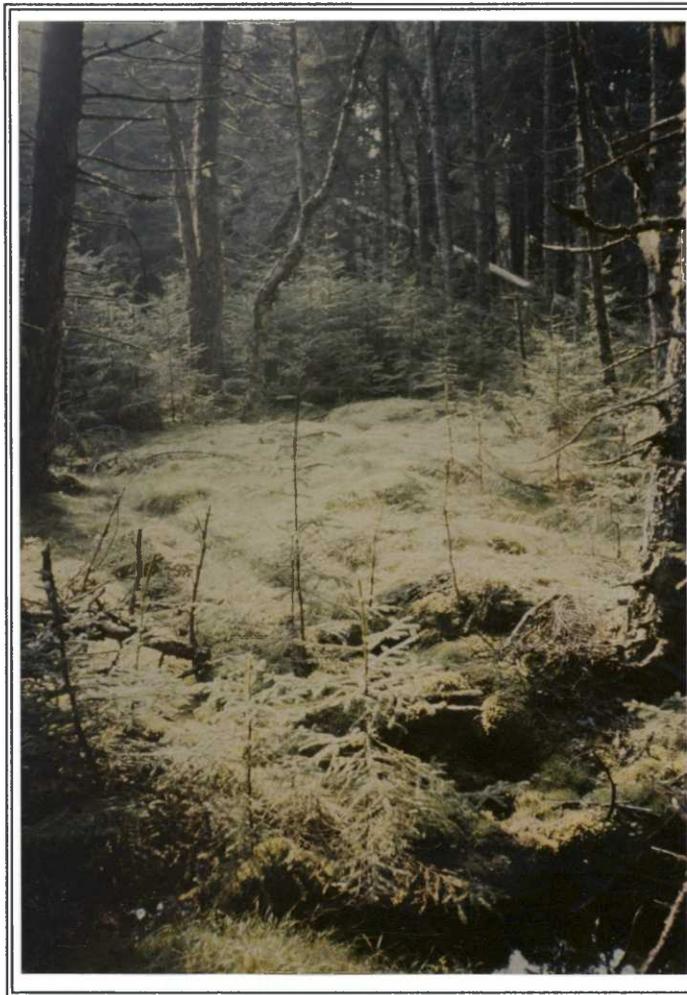
### 3. Forests

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.



The moist climate at Cross creates a blanket of moss. BB

#### 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.

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>
1983	Tree/nest intact Unoccupied	Tree/nest intact Unoccupied
1984	Tree/nest intact Unoccupied	Tree/nest intact Unoccupied (eagles) Occupied (osprey)
1985	Tree/nest intact Unoccupied	Tree/nest intact Active <b>Eaglets: 0</b>
1986	Tree/nest intact Unoccupied	Tree damaged/nest fallen Unoccupied
1987	Tree/nest intact Active <b>Eaglets: 1</b>	Tree not found
1988	Tree/nest intact Active <b>Eaglets: ?</b>	Tree not found
1989	Tree/nest intact Active <b>Eaglets: 2</b>	"
1990	Tree/nest intact Active <b>Eaglets: 1</b>	"
1991	Tree/nest intact ** Active <b>Eaglets: 1 observed, 0 fledged **</b>	"
1992	Tree/nest intact Active <b>Eaglets: 1</b>	
1993	Tree/nest intact Active <b>Eaglets: 1</b>	

\* Apparently an older nest structure.

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

In July 1991, an immature bald eagle was found dead on dead on Cross Island and sent to Madison for further analysis. Results came back in October 1992 indicating death was due to kidney failure which is often caused by high levels of contamination. Samples of brain, liver and kidney were saved for additional heavy metal testing.

### 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 initiated a research project focusing on this topic in 1993. (See Petit Manan NR93 - D.5.)

### 8. Game Animals

A Deer Pellet Group Count census was conducted in April 1991. This was the first time a census like this has ever been conducted on the Island. Of the 848 plots established, 68 (8%) had to be deleted due to ice or snow masking potential pellet groups. Thus, there were 780 "good" 100 ft. sq. (4'x25') plots established along 10.4 miles of the 20 transects.

Acting Manager Mills (PMN), Maintenance Man Schick (PMN), Zone Biologist Atwell, Regional Biologist Gavutis, and Refuge Biologists Healey (PKR) and Gallegos (MSQ) spent 33.5 person-hours running the transects which translated into one-third mile of transect per hour.

Thirty-nine pellet groups fell within 34 plots, yielding 4 to 10 deer/sq. mi. according to a program run by State Biologist Lavigne.

However, the quality of the data may be questionable because of lack of participant experience in dealing with coastal deer, ground/pellet conditions, and unreliability associated with pellet counts.

Usually, winter droppings are the typically groups of firm pellets. Apparently, this is not the case on coastal islands where deer may rely heavily on seaweed, cranberry, etc., especially in winter. Snow cover, depth and duration are probably less in coastal locations, due to ameliorated (ocean) temperatures and salt spray making even grasses and forbes more available.

Subsequent to the survey Gavutis discussed these concerns with several biologists with deer expertise. Apparently, most favor vegetative (browse) surveys or health indices due to the unreliability of pellet count data. In spite of these concerns, everyone felt both the survey and biological visit to the island were valuable. Deer sign was more common in the peripheral areas of the island where the thick spruce gave way to shrubs, forbs, and ericaceous species, along with grasses and sedges. A few bones of one deer were located, but it had died prior to this past winter. Only two live deer were observed. Overall deer densities appeared to be low. The habitat is relatively poor (overmature), with the exception of the shoreline where most of the sign was observed; there was no browse line. (See Cross NR91 G.8.)

#### 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  $\frac{1}{4}$  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.

In 1991, staff from Moosehorn and Petit Manan documented violations of the  $\frac{1}{4}$  mile buffer zone by the existing aquaculture operation. This minimum setback distance from a refuge boundary was agreed upon between the Service and the Corps. Ten circular pens and a two story block building on a barge were moored well within the zone. In addition, portions of a walkway had washed up on shore.

The FWS does not have authority to write a citation on these violations, however, a verbal warning was given along with recommendations to move the structures within two weeks. The Army Corp of Engineers, Augusta, was notified.



Northwest Head Aquaculture Site has proved to be an enforcement headache. BB

The saga continued in 1992 with additional violations noted. In April we finally got the COE to visit the Cross Island pen facility. During this visit it was again noted that the barge was inside the designated line. Additional permit violations were noted during an August visit to the site. They had placed 10 moorings inside the permit line, garbage was noted along the

shoreline including; plastic salmon feed bags, bottles, gloves, floats, pieces of netting and other plastic debris. Outward Bound quit using the area because of the litter and noise of the operation.

In 1993 the refuge was notified by a State Game Warden about further violations at the pen facility. These allegations revolved around the salmon workers shooting seals and diving birds being caught in underwater predator nets. Benedict surveilled the area from May 25-27. Unfortunately the visit coincided with a compliance visit from DMR divers to film bottom conditions so no violations were documented. One event that was witnessed was the loss of an entire net full of fish ready for processing. A processing barge was attempting to lift the net when a cable broke sending the net to the ocean floor. Further observations of this operation are needed.

#### 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.

## I. EQUIPMENT AND FACILITIES

### 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. See Section D. 4.

## J. OTHER ITEMS

### 3. Items of Interest

A revenue sharing check for \$16,535 was presented to the town of Cutler this year as compared to \$18,136 last year.

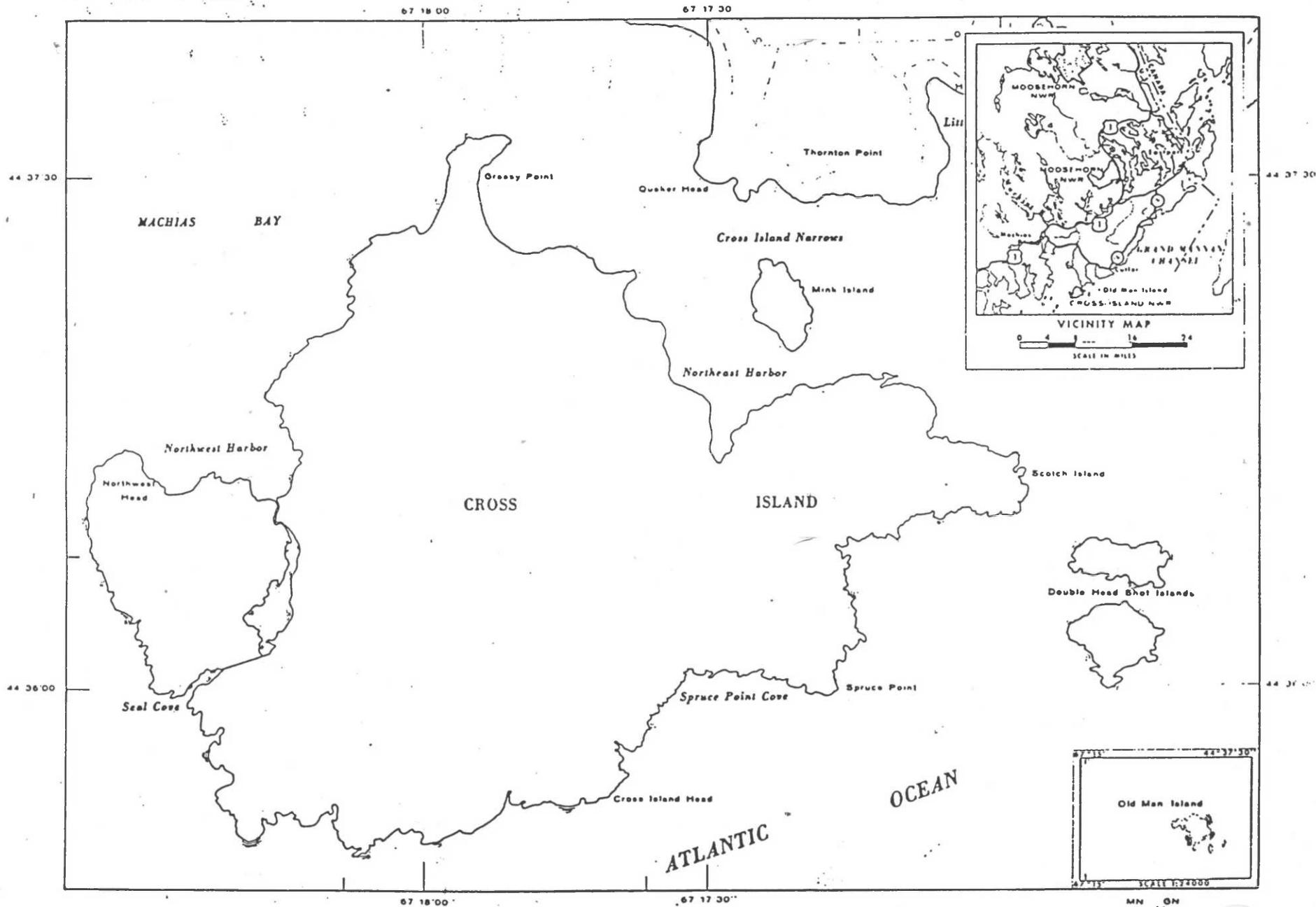
### 4. Credits      BB: All Sections.

# CROSS ISLAND NATIONAL WILDLIFE REFUGE

UNITED STATES  
DEPARTMENT OF THE INTERIOR

WASHINGTON COUNTY, MAINE

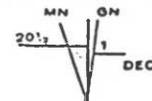
UNITED STATES  
FISH AND WILDLIFE SERVICE



ED IN THE DIVISION OF REALTY  
RVEYS OF THE U.S.G.S.  
U.S.F.A.W.B.

SCALE 0 1000 3000 4000 FEET

0 1/4 1 KILOMETERS



SEAL ISLAND NWR

SEAL ISLAND NATIONAL WILDLIFE REFUGE  
Matinicus Isle Plantation, Maine

ANNUAL NARRATIVE REPORT

Calendar Year 1993



## 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

Atlantic Puffins nested at Seal Island for the second straight season after a 105 year absence from their largest historic nesting site south of the Canadian border. Active nests more than doubled from 7 in 1992 to 16 in 1993.

Terns increased on Seal Island by 234 nesting pairs.

#### 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.

This year a weather station and computer software capable of downloading data was purchased for Seal Island. Unfortunately, interference from the CB radio caused the min and max recordings stored in the unit to go haywire. This prevented researchers from getting daily high and low temperatures and maximum wind speeds. Shielded wire will be purchased to correct this problem. Power also became an issue at times when power needed to be shut down to the weather station to conserve energy to operate the radio.

#### 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.

##### 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.

#### PUFFINS

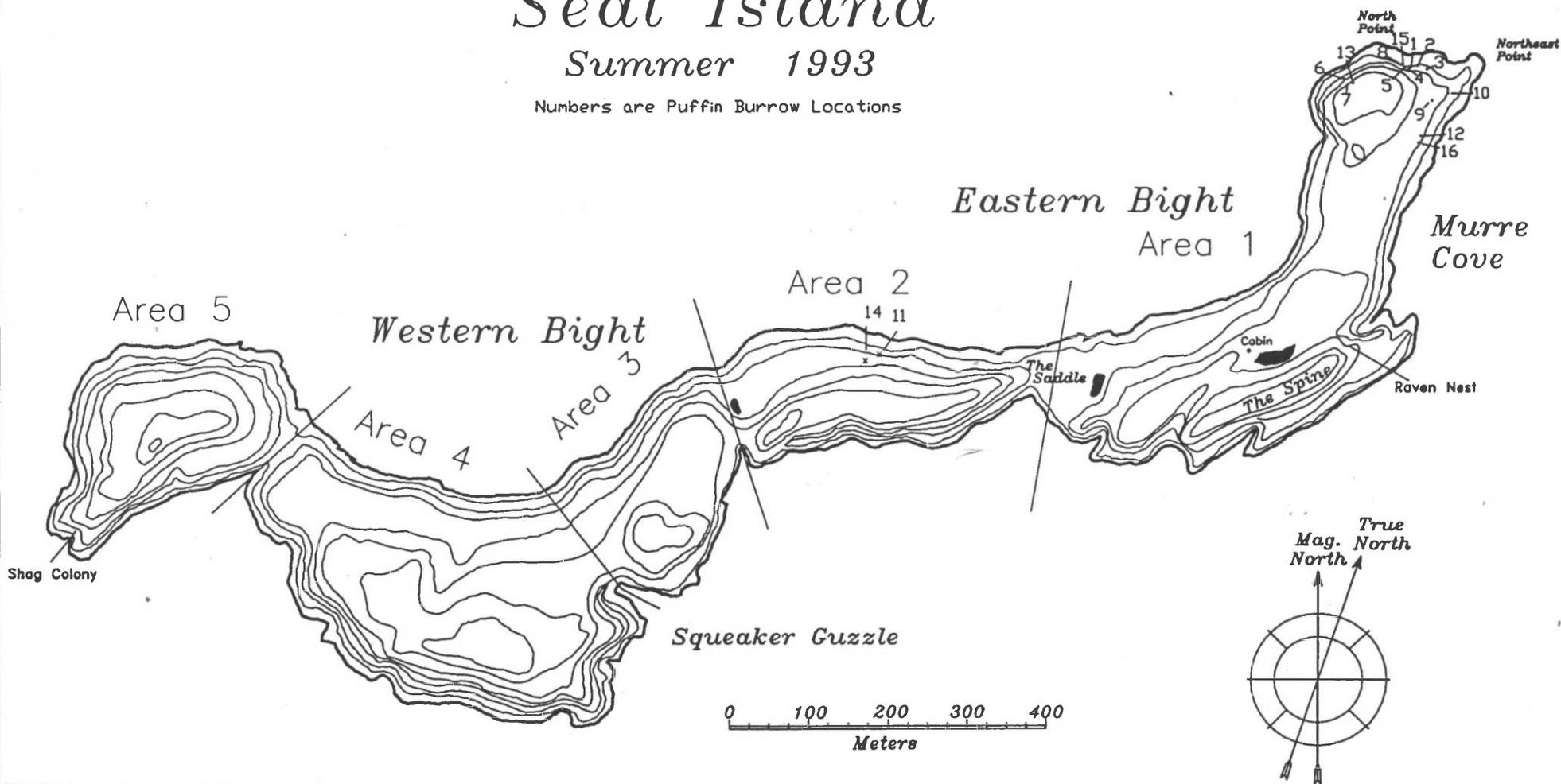
Between 1984 and 1989, 912 puffin chicks were transplanted from Great Island, Newfoundland, and handraised in sod burrows by NAS interns. They were banded with color and monel bands before they fledged. After fledgling, puffins go to sea where they spend their first two to three years before returning 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 tenth year of the project. NAS researchers arrived on 21 May and except for 12 days the island was continuously occupied until 21 August. This was the second year that Atlantic puffins successfully bred on Seal Island this century, and the number of active nests more than doubled from 7 to 16.

The mean high count for puffins also increased from 16.6 in 1992 to 18.3 in 1993. (See Table 1) On August 8th, a record 41 puffins were seen on Seal Island. The number of banded, nonbreeding individuals seen however, fell dramatically. Only 36 banded Seal Island birds were identified this year compared with 78 last year and 66 in 1991. The missing birds were fairly evenly split between the 1988 and 1989 year classes, with 1988 losing 24 out of 37, and

# Seal Island

Summer 1993

Numbers are Puffin Burrow Locations



Island outline and contours digitized  
from USGS 1:24,000 topo map.  
Contour Interval 10'

1989 loosing 21 out of 40. This apparent absence of returning birds follows a similar observation noted last year with the 1988 year class. Approximately 58% of the 1988 birds seen in 1991 failed to return in 1992. Causes for this decrease could be band wear and loss, decreased observer effort (220 hours compared to 452 in 1993), or perhaps this is "normal" puffin behavior.

Table 1: Mean high count (sum of daily high counts/# of days spent looking) for Atlantic Puffins on Seal Island.

Year	Mean High Count
1990	3.8
1991	9.3
1992	16.6
1993	18.3

Breeding pairs nested once again in the boulder berm, and also expanded to sites in the jumble areas along Murre Cove shore. The reproductive success of these birds was not as good as last year when success was an astonishing 100%. Fledging was assumed when either the nest had been seen feeding for 21 days or a large chick was either banded or seen at the burrow. Of the 16 nests, 3 certainly failed, 9 were assumed to have fledged, and four were undetermined. Of these undetermined nests some were not seen feeding for 21 days and some nests researchers couldn't reach the chicks. Depending on whether the undetermined nests are assumed to have fledged or not, reproductive success varied between 56 and 81%.

Seal Island is well on the way to establishing a puffin colony. Colonial nesting seabird recolonization projects require a great deal of time, patience, money and a longterm commitment by everyone involved. In the case of Seal Island there was no "breeding memory" by any birds since they had been extirpated over 100 years ago, consequently transplanted birds were necessary. Researchers recognized at the beginning of the project that the reluctance of this species to colonize new islands, late sexual maturity (4 to 5 years), and highly variable survival rates of returning chicks would require a minimum commitment of ten years. It remains a mystery why the return rate varies so greatly between years. Puffin chicks do not receive any parental care after they fledge. They spend the first three years at sea dodging fishing nets, bilge slicks, gulls, and dealing with other uncontrollable factors such as weather and food supplies. The lesson, however, is that

variable survival rates affect both populations and efforts to restore species. Restoration projects which run for just a few years, could miss the occasional high survival year that makes the difference in whether a project succeeds or fails.

### TERNs

Nest Counts - Arctic and common terns again returned to nest on Seal Island; they nested in 1989 for the first time since the 1950's. The nest count was performed on June 17th this year and again showed an increase from last year. A total of 915 nests were found (corrected to 971) as compared to 681 last year. The nests consisted of 400 (43.7%) Common tern and 5215 (56.3%) Arctic tern nests. They again nested on the north hill, in the gull-free zone.

Productivity - Reproductive success of the colony was estimated by monitoring 45 Arctic and 32 Common nests from four enclosures and four feeding study areas. Arctic nests in the enclosures achieved 93% hatching success and Commons achieved 89% success. Fledging success was 1.33 for Arctics and 1.53 for Commons.

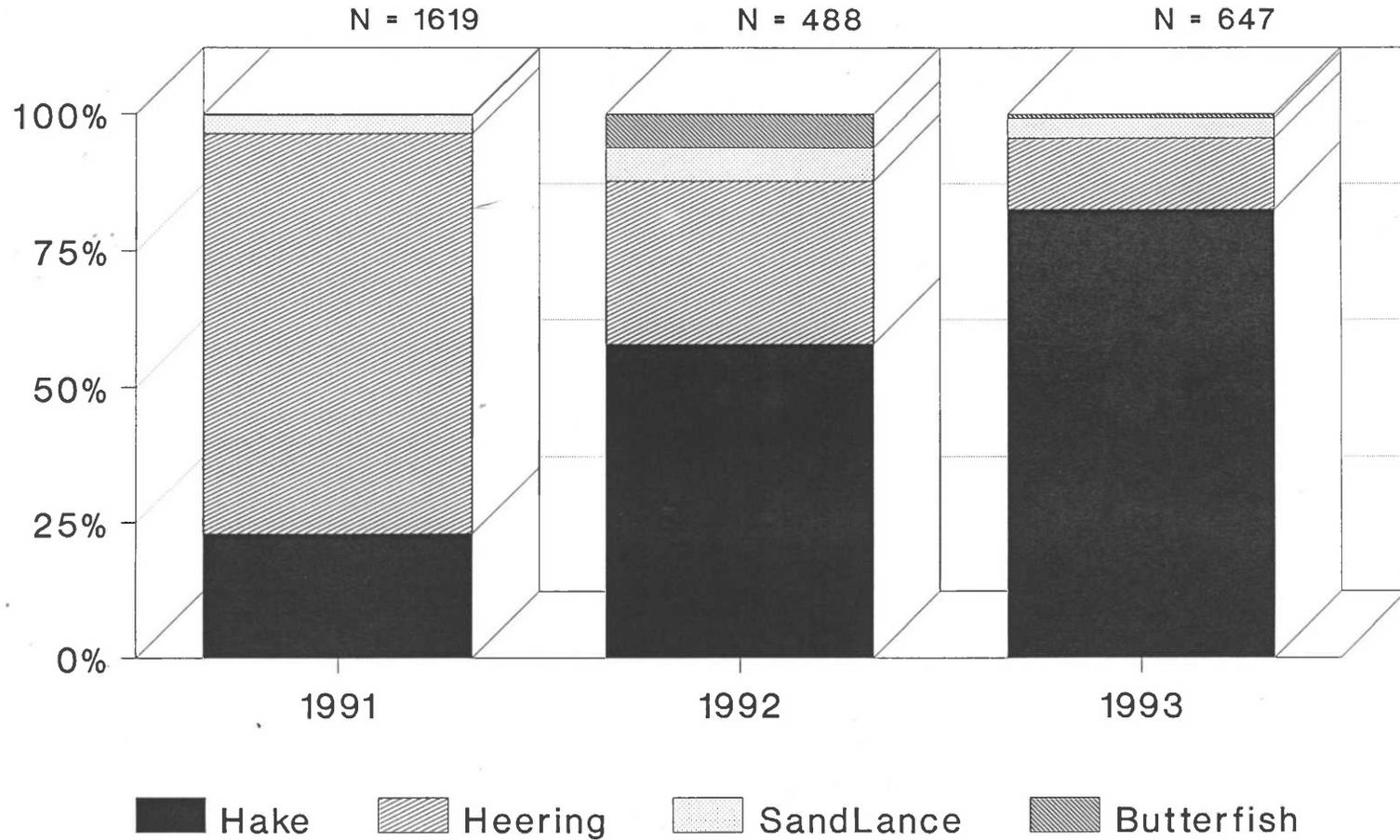
Feeding Study - For the third year observations were gathered to determine prey species composition, feeding rate, and feeding recipient in Arctic and Common terns. Observers watched three to six nests during three hour blind stints. The species of prey items were determined by observation as the adult bird fed the item to the chick. In Table 2 a breakdown of prey items for Arctic tern feedings is shown compared to 1991 and 1992 Arctic tern results.

The prey species for Arctic Terns has changed dramatically over the past three years while that of the commons show no appreciable change in the last two years. Assuming that arctics tend to feed further out than commons this might be due to a lack of herring offshore. Whether this is a natural fluctuation in either fish populations or patterns of migration or a symptom of a problem of overfishing is unknown. This change in diet does not seem to have seriously effected the reproductive success of the arctics which has gone from 1.47 ch/nest in 1991 to 1.33 ch/nest in 1993.



Food prey species for Arctic and Common Terns have been studied at Seal Island for the last three field seasons.  
B.S.

# Arctic Tern Prey Species Seal Island, 1991 - 1993



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

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.

PUFFINS

Banded Birds - Puffin observations were conducted 69 days between April 26th and August 19th. A total of 156 banded birds were seen throughout the season with a maximum of 44 bands identified in one day. Origin of banded birds were as follows:

Eastern Egg Rock	12
Matinicus Rock	90
Seal Island	29
Machias Seal Island	25

Burrow Sites/Productivity - A total of 157 burrows were located and checked for activity and availability of chicks for banding. Of these, 115 were judged to be active. Thirty-five of the burrows were new, found by observation of feeding by adults or by intensive searching. Sixty live chicks were observed or heard, and a record 37 of these were banded between July 6 and August 18.

TERNS

Nest Counts - On June 12-14 a total of 1063 tern nests were counted (corrected to 1095). This represents a total decrease of 3.7% from last years adjusted total of 1138. The number of common tern nests dropped from 200 in 1991 to 146 nests in 1992 to 95 in 1993. Species ratio was determined from a random sample of 129 nests resulting in 45% Common tern and 55% Arctic.

Productivity - Arctic Tern fledgling success was determined through a sample of 58 nests in three fenced enclosures and 21 nests which are part of the feeding study. A chick was considered fledged if it was observed until 15 days of age and was not found dead thereafter. In the 79 nests monitored, 100 chicks fledged, a yield of 1.3 chicks per nest. The hatch order for chicks plays an important part in their fledging success.. Success of first hatching chicks was .86% compared to .69% for second and 0% for third hatched.

Arctic Tern Feeding Study - A study of provisioning for Arctic tern chicks was conducted in June and July. A total of 593 nest observer hours were logged and in this time 1,296 feedings were observed. Due to the recent realization that some Arctic terns specialize in a diet high in invertebrates this particular attention was focused on this phenomenon. Nests were designated invertebrate specialist nests if at least 20% of the diet is made up of invertebrates. Invertebrates specialist adults are usually paired with other invertebrate specialists. Researchers were excited by the possibility of being on the threshold of the evolution of a new species (the Arctic Amphipod-eater) so they also looked for physical differences that might coincide with behavioral specialization. Adult weights, wing chords and culmens were measured and compared. The range of weights and culmen lengths was greater in the fish specialists but there was no significant difference between the averages of the two groups. Invertebrate specialists had a greater range of wing-chord measurement but again no significant difference. As yet, there is only a behavioral partitioning of resources to separate these birds.

Banding - A total of 123 terns were banded in 1993; of which 4 were adult arctics, 118 were arctic chicks and one was a Roseate Tern chick.

## 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, Peter Duley, Scott Hall, Ted Gaines, Laura Doty, Donna Ramil, Wendy Thomlinson and Krista Amey.

### 4. Volunteer Programs

This years research team on Seal Island was aided by volunteers Amy Cantor, Wing Goodale, Beth Orenstein, Robin Juan, and Tiffany Thompson. The five volunteers spent a total of 86 volunteer-days on the island.

## 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, Liquisticum 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.

No active habitat management is planned.

### 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.

### 2. Endangered Species

One pair of roseate terns were located at Matinicus Rock on July 15, shortly before its fledging. Up to four Roseates were seen on Seal Island during the nesting season and several with fledged young appeared on the rocks by the tern colony in August.

### 3. Waterfowl

During the 1992 gull nest count NAS personnel counted 374 eider nests this year.

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

The Audubon Society made an effort to get a good estimate of the number of nesting guillemots on Seal island in 1988. They located a total of 454 burrows, with a total estimate of 500 pairs nesting. Therefore, the high count of 1,609 individuals in the water around the island is not surprising. This makes Seal Island one of the largest guillemot colonies in Maine. This survey was not repeated this year or last.

There are 1000+ pairs of Leach's storm-petrels and 45 pairs of double-crested cormorants nesting on Seal. The storm-petrel estimate is very conservative. Petrels are difficult to census since they are nocturnal and nest in burrows in the sod. For the past two years NAS has tried to determine the role of olfaction as a stimulus for colony formation in Leach's Petrels. Due to contamination of the data by many factors it was impossible to come to any conclusions. The study needs better techniques to determine whether a petrel really visited a burrow and if scent attracted it there. NAS continued the ages long study on burrow use by storm petrels on Matinicus Rock. Of the 150 burrows which were sought, only 80 were located; 58 were found to be active with a bird or egg present at some point. A total of 61 birds were banded: 27 adults, and 34 chicks. Hatching success was estimated to be 82.6%, for a sample of 46 eggs assuming no predation.

Razorbills again nested at Matinicus Rock. Razorbills are very susceptible to disturbance so researchers did not enter the colony until the beginning of July. An additional sixteen nests were located this year and 37 of the 44 burrows checked appeared active determined by the presence of chicks, eggs or eggshells. Nineteen chicks were seen including one dead chick with two broken wings.

A Common Murre attraction program was begun at Matinicus Rock in 1992. On April 20, 1993, 46 wooden murre decoys were erected on the seaside ledges of Matinicus Rock, an increase from the 24 decoys set out in 1992. Twelve artificial eggs were also attached to the rock on decoy stands along with CD recording playback. Murres were present within the artificial colony almost every observed day (38 out of 40 days) between May 16 and June 28. On at least 19 days copulation attempts were observed. Of the breeding behavior billing made up 34.2% followed by allopreening which made up 27.8%. On June 10th, a courtship feeding was observed.

Based on two years of data it appears that murres do not appear on islands in Penobscot Bay until at least mid-May. Decoys appear to provide visual cues about where to land but it must be coupled with sound to hold attention.

Laughing gull numbers increased again on Matinicus Rock from 181 in 1991 to 231 in 1992 and to 271 in 1993. Herring and Greater Black-

backed gull numbers are discussed in Section G-15.

#### 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 in importance. This year no gulls were shot. There were only two records of tern predation by gulls this season. Although there was consistently at least one dozen herring and black-backed gulls loafing on the island but they seemed to be waiting for lobsterboats and showed little interest in the tern colony. When gulls did happen to enter the airspace over the colony they were often driven off by terns and forced to retreat.

There was no poisoning of gulls this year, however the nests found during the eider and gull nest count were punctured with a nail on the end of a stick. This kept adult birds incubating dead eggs instead of immediately relaying.

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. Throughout the summer nine confirmed instances of tern chick predation were observed between June 22 and July 28, 1993. Two Herring gull adults were shot on July 12 and July 14, assumed to be repeat offenders. In total seven gulls were eliminated in 1993. Gull control in one form or another has been practiced on Matinicus Rock periodically since the 1930's.

## 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 a total of 23 visits were made by Captain Bob Bernstein on the "Finback", a fifty foot party boat that runs tours out of Rockland. This summer the 10,000th bird watcher boarded one of these boat tours. A portion of the fare from these tours are donated to the Puffin Project.

## I. EQUIPMENT AND FACILITIES

### 2. Rehabilitation

Structural improvements to the island this year included a mooring in the Eastern Bight and a new set of stairs on the path to the cabin.

J. OTHER ITEMS3. Items of Interest

A revenue sharing check for \$1,391 was presented to Knox County this year as compared to \$1,525 last year.

4. Credits      BB: All Sections.

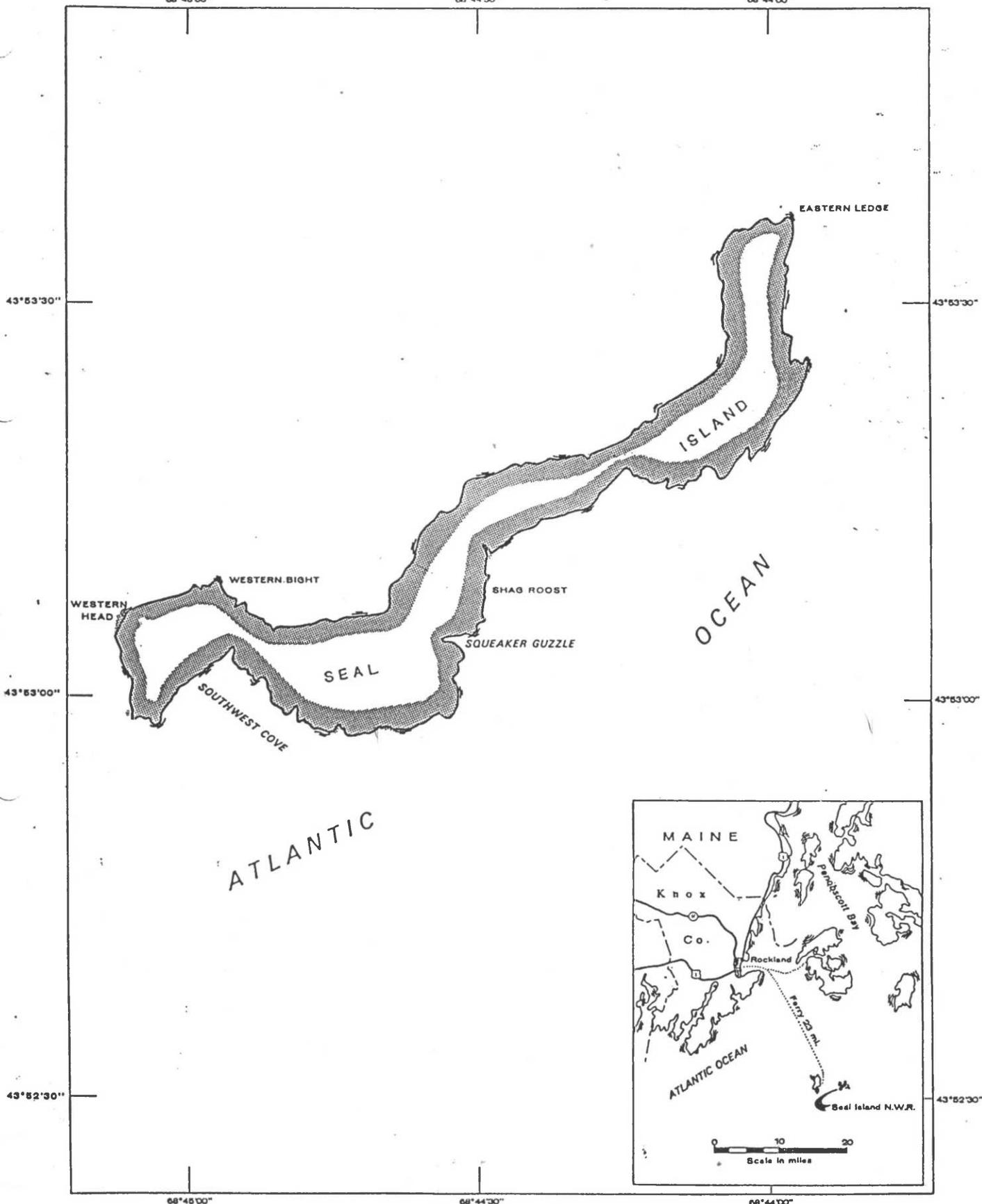
Photos:      BB: Brian Benedict  
                  BS: Bill Silliker

# 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 SURVEY BY U.S.O.S. AND U.S.F.A.W.S.

0 250 500 750 1000 FEET



MEAN  
DECLINATION  
1953

BOSTON, MASSACHUSETTS AUGUST 1978

75 25 500

FRANKLIN ISLAND  
NWR

FRANKLIN ISLAND NATIONAL WILDLIFE REFUGE

Friendship, Maine

ANNUAL NARRATIVE REPORT

Calendar Year 1993

## 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.



Aerial View of Franklin Island.

BB

## 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

Leach's storm-petrels 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. 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 scapings 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 \$729 was presented to the town of Friendship this year, down from \$800 last year.

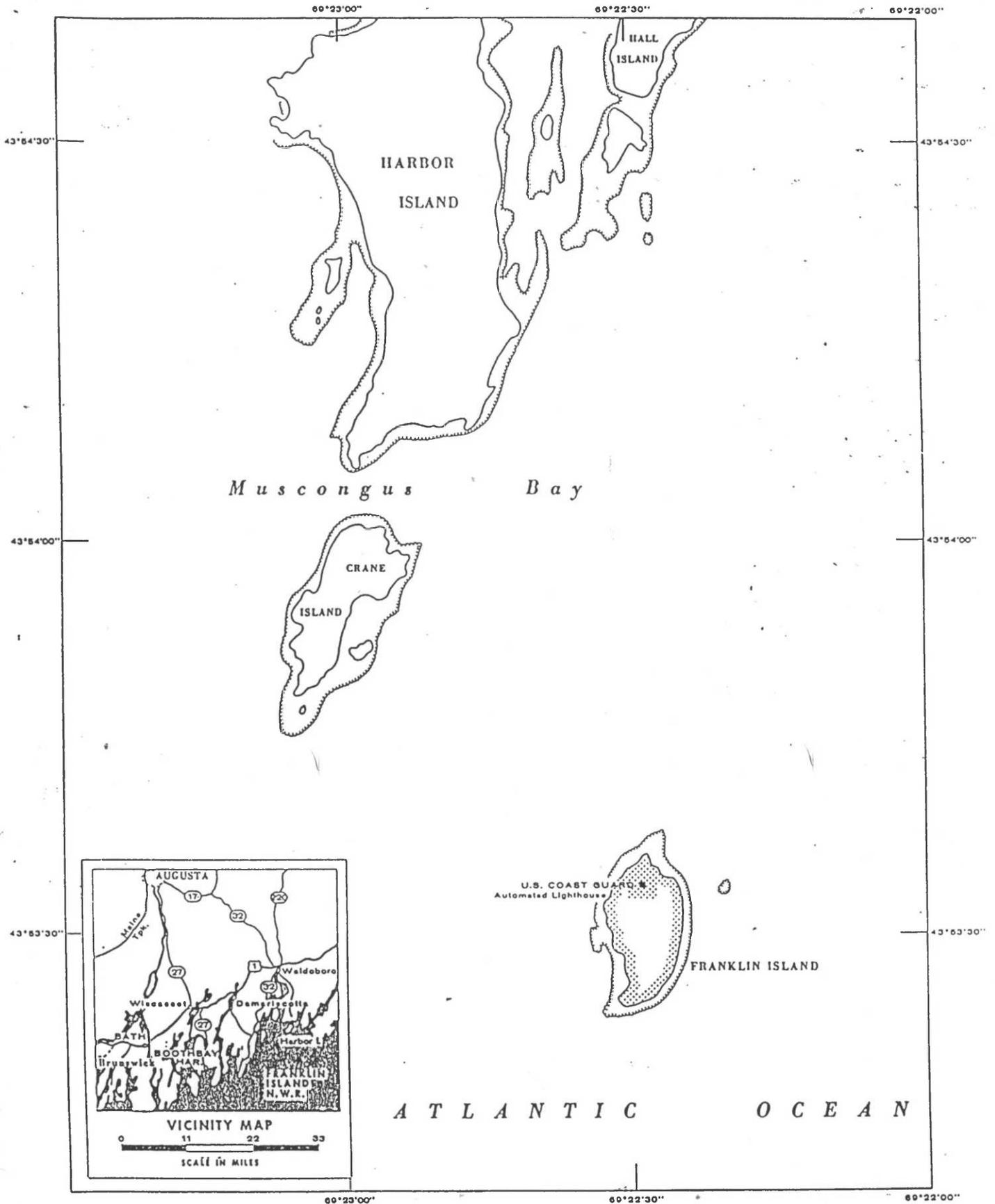
#### 4. Credits BB: All Sections.

# 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.I.T. & W.

BOSTON, MASSACHUSETTS

JULY 1974



MEAN  
DECLINATION  
1933

5R ME. 864



POND ISLAND NATIONAL WILDLIFE REFUGE

Popham, Maine

ANNUAL NARRATIVE REPORT  
Calendar Year 1993

## 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. A 1992 visit produced a nesting estimate of 250 herring gulls and 100 Great Black-backed gulls.

A 1992 Pond Island visited 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 1800s 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 along with 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.

#### 16. Other Non-Wildlife Oriented Recreation

Sea Kayaking has become an increasingly popular sport in the northeast. Many people are enjoying this sport on their own or paying various guiding services for package trips. This is a

sport that requires a high degree of skill, understanding of tidal currents, weather impacts, and respect for cold water. The Maine Island Trail Association (MITA) has produced a guide book which directs kayakers to islands where camping is permitted, warns them of hazards, and promotes safe, responsible use of the Maine Coast.

In 1991, a fatality occurred when two sea kayakers left Pond Island. The mouth of the Kennebec River is classified as a "Danger Area" in the MITA guide book. The principal reason for this classification is the frequent combination of large, onshore-directed waves and seaward-directed, strong ebb tidal currents of the Kennebec. As the onshore-directed swell or waves move into the area where the river currents are running against them, the wave height not only increases dramatically in proportion to the current velocity, but the resulting wave steepness produces large, plunging-DUMPING-waves. The Kennebec flow bifurcates at Pond Island; the stronger branch flows to the east of the island.

#### J. OTHER ITEMS

##### 3. Items of Interest

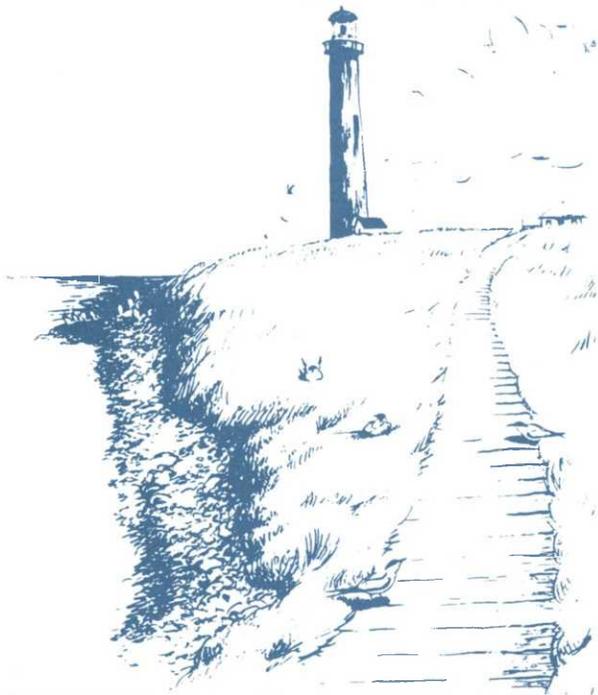
A Refuge Revenue Sharing Check for \$710.00 was presented to the town of Phippsburg this year, compared to \$814.00 last year.

4. Credits BB: All Sections. Photo: BB Brian Benedict

# *Birds*

PETIT MANAN  
National Wildlife Refuge

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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 – IBISES

—	• 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	
—	• 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	
—	<i>Peregrine Falcon</i> .....	r	o	c	
—	Gyrfalcon .....				r

#### GROUSE – 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	
—	<i>Piping Plover</i> .....	r	r		
—	• Killdeer .....	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 <sup>†</sup>	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

s S F W

**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	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	u
___ • Chipping Sparrow .....	u	u	u	
___ Clay-colored Sparrow .....	r			

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	



## 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.

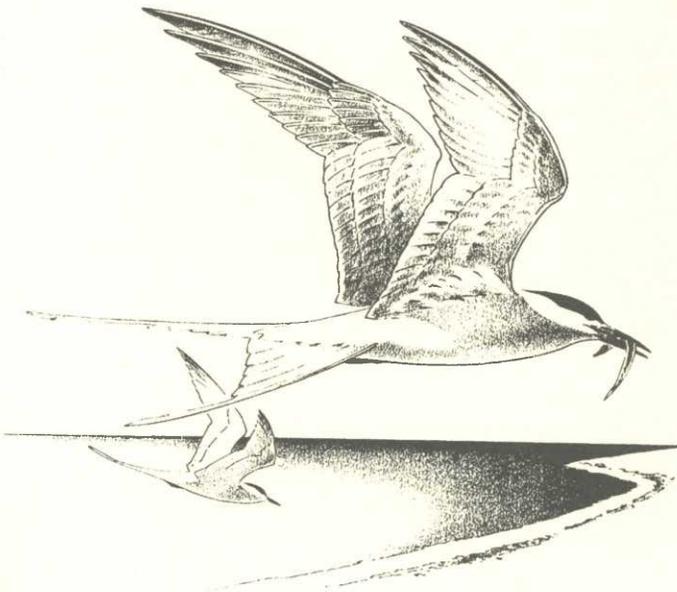


DEPARTMENT OF THE INTERIOR  
U.S. FISH AND WILDLIFE SERVICE

# *Petit Manan*

NATIONAL  
WILDLIFE  
REFUGE

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*Barry Van Dusen*

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Steuben, Maine

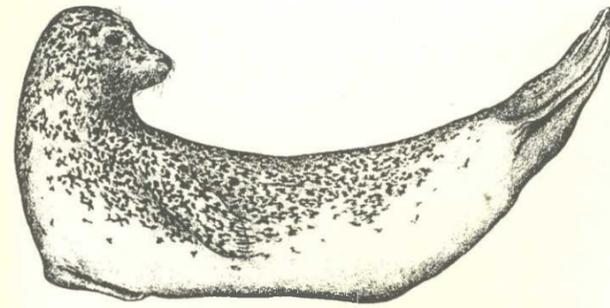
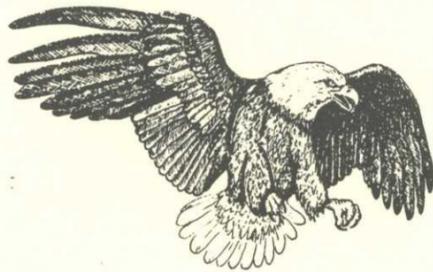
## Wildlife of the Coast

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.

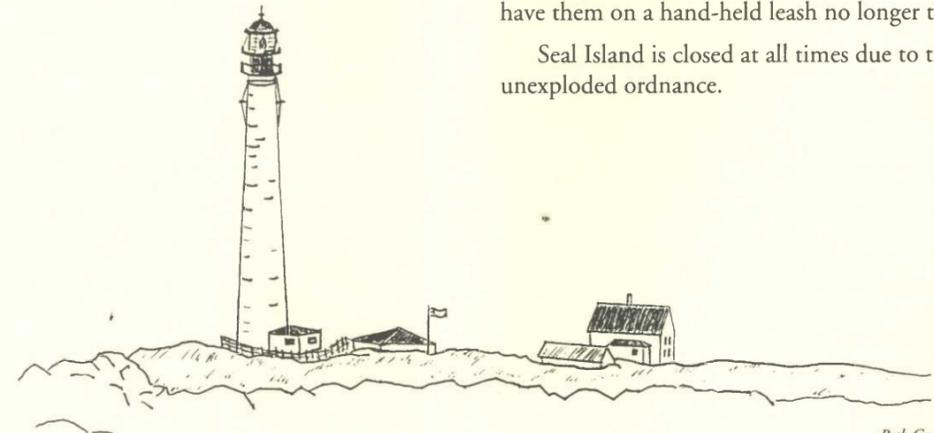
Some of the freshwater marshes on the Point are managed to provide optimum waterfowl habitat. The water level in former cranberry bogs is raised or lowered to create

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

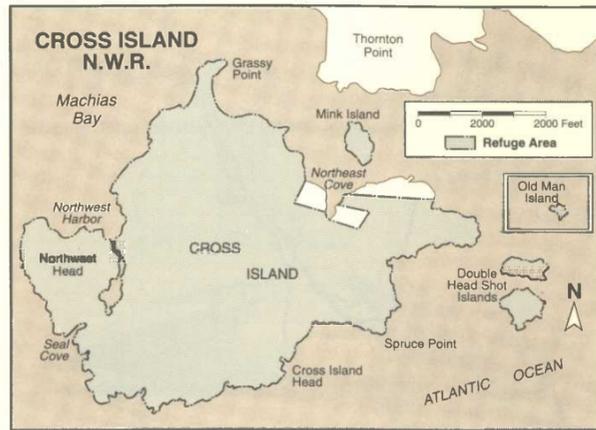
Petit Manan Point has two interpretive foot trails that offer visitors a chance to see and photograph wildlife in several coastal habitats. Birch Point Trail (3 miles round trip) is a gently sloping walk through blueberry fields and woods to the salt marshes on the northeastern corner of the point. The 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.



### 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).

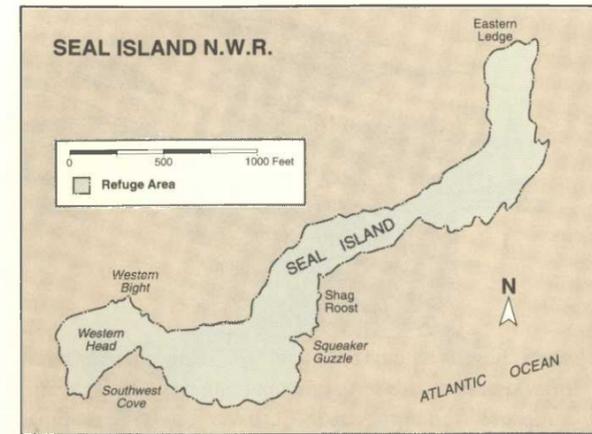
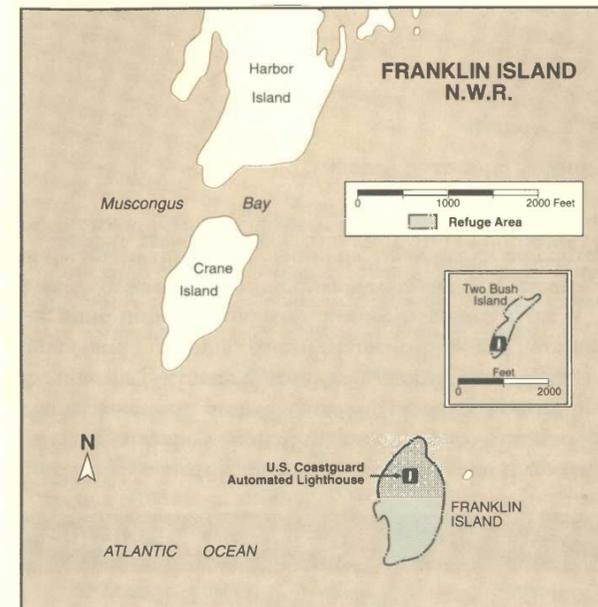
*Cross, Mink and Scotch Islands* are forested with dense stands of red and white spruce, balsam fir, yellow and paper birch and red maple. Rocky cliffs, some over 100 feet high, cobble beaches and salt marshes dominate the shoreline.

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.

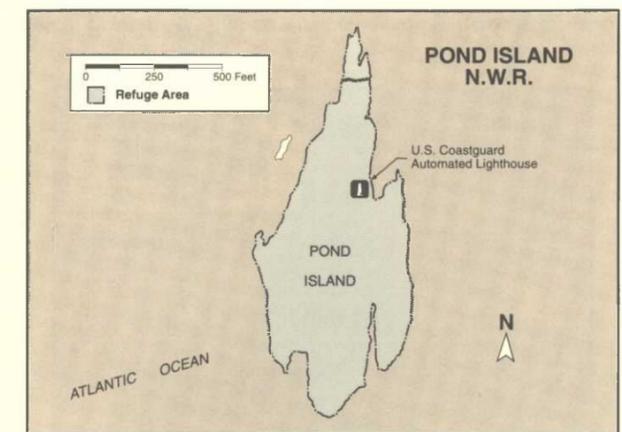
This remote grass and granite island offers prime seabird nesting habitat with boulder fields and ledges for puffins, razorbills and black guillemots; grass and ledge areas for terns; raspberry and grass thickets for eiders; and soft peat and glacial till soils for burrowing Leach's storm-petrels. As 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 lighthouse 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

## 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.

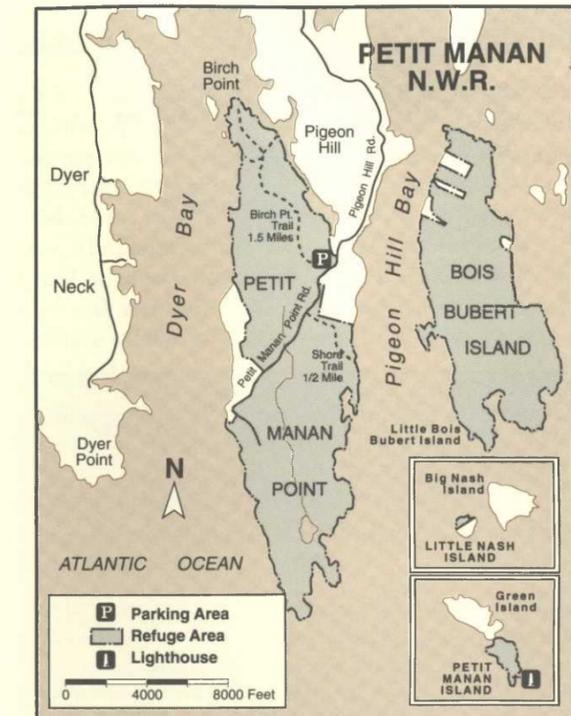
## The Refuges

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

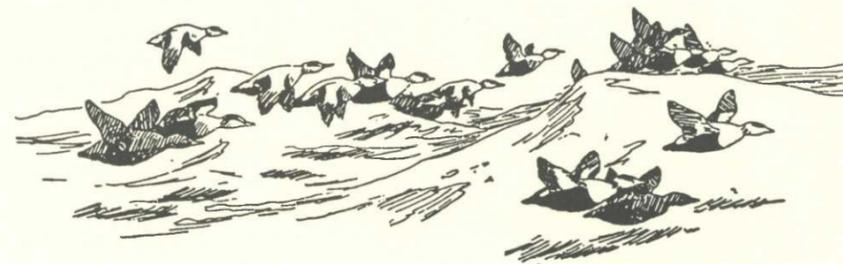
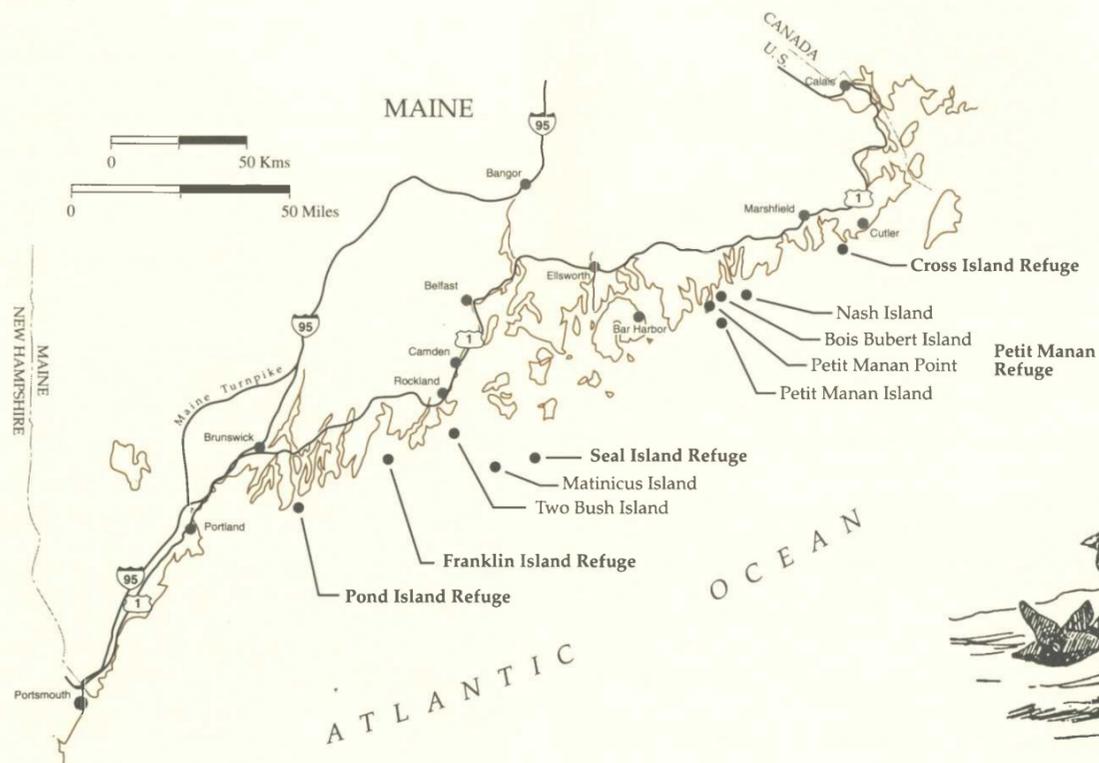


heath peatlands, blueberry barrens, old hayfields, fresh and saltwater marshes, cedar swamps, granite shores and cobble beaches.

*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.

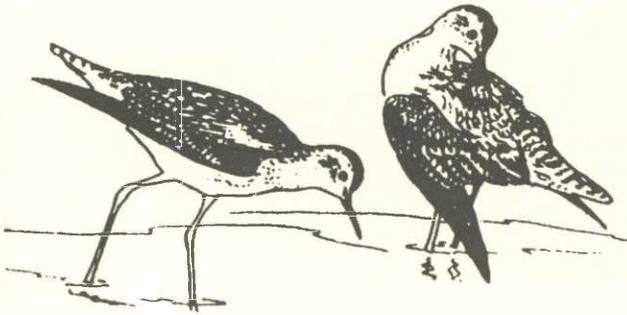


## Wildlife Calendar

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

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



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U.S. FISH AND WILDLIFE SERVICE

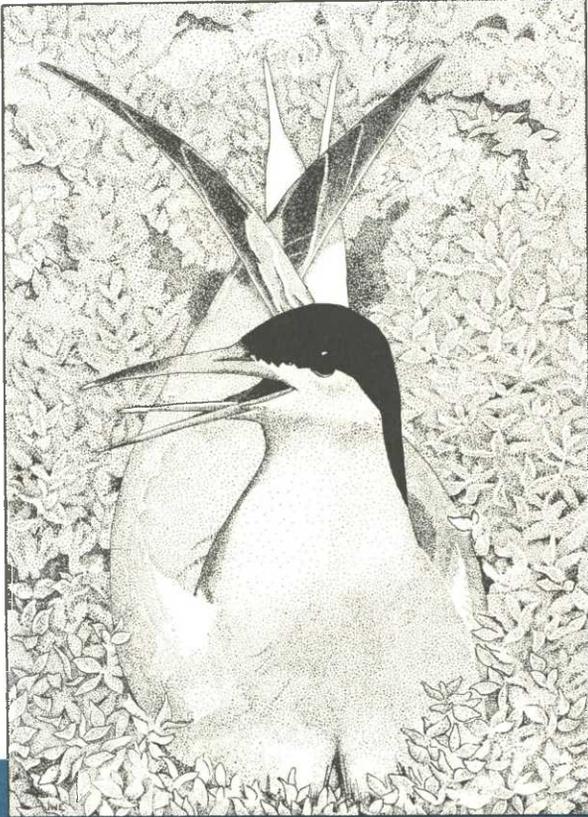
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★ U.S. GOVERNMENT PRINTING OFFICE: 1994—501-965

June 1994

# ISLAND ETHICS

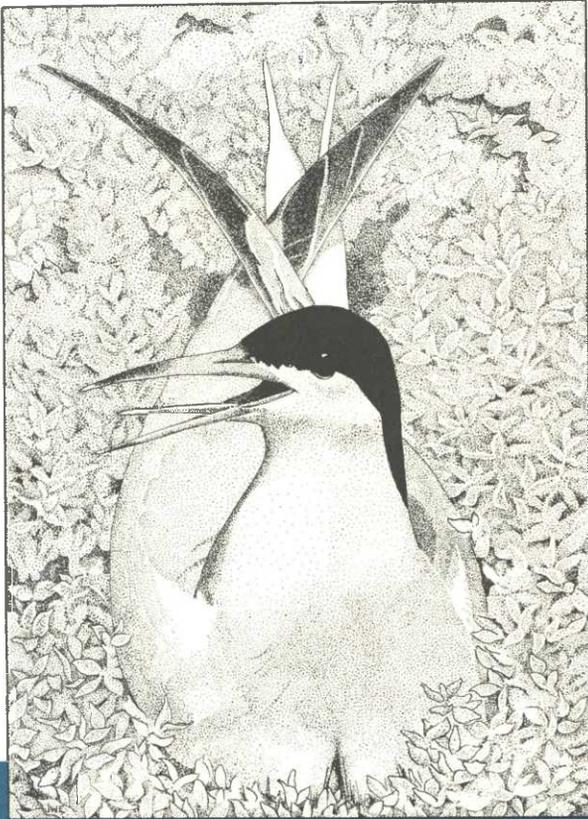
*Recognizing and Protecting  
Colonial Nesting Seabird  
and Waterbird Islands in  
the Gulf of Maine*



*A Guide for the Public*

# ISLAND ETHICS

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



*A Guide for the Public*

# 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



© Josephine Ewing

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.

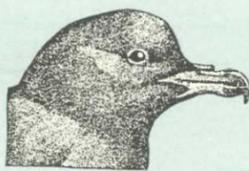
There are many opportunities for recreation on other islands in the Gulf of Maine, including visits to state and federal parks. In addition, organizations like The Nature Conservancy, the Audubon Society, the Maine Island Trail Association, and local land trusts—as well as state and federal public land 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.

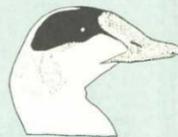
## Major Groups of Colonial Nesting Seabirds and Waterbirds in the Gulf of Maine



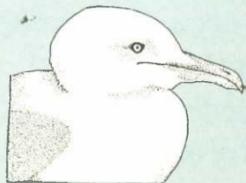
**Terns**  
(Arctic Tern, Common Tern, Roseate Tern)



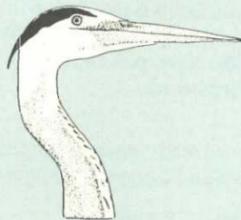
**Petrels**  
(Leach's Storm Petrel)



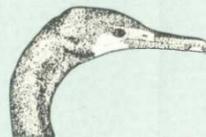
**Waterfowl**  
(Common Eider)



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



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



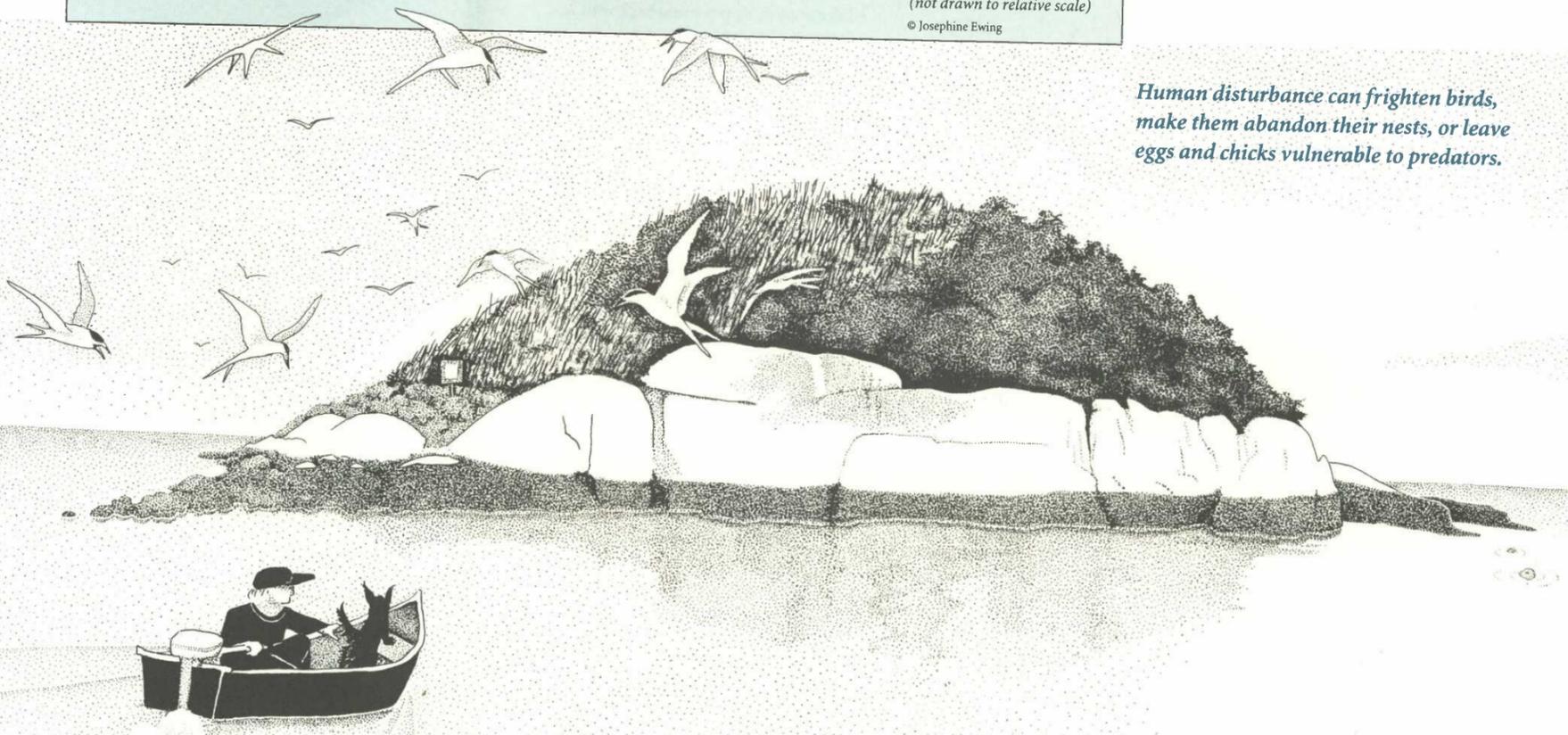
**Cormorants**  
(Double-crested Cormorant)



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

(not drawn to relative scale)  
© Josephine Ewing

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



# ISLAND ETHICS

## Special Island Residents Colonial Nesting Seabirds and Waterbirds

There 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,

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.*

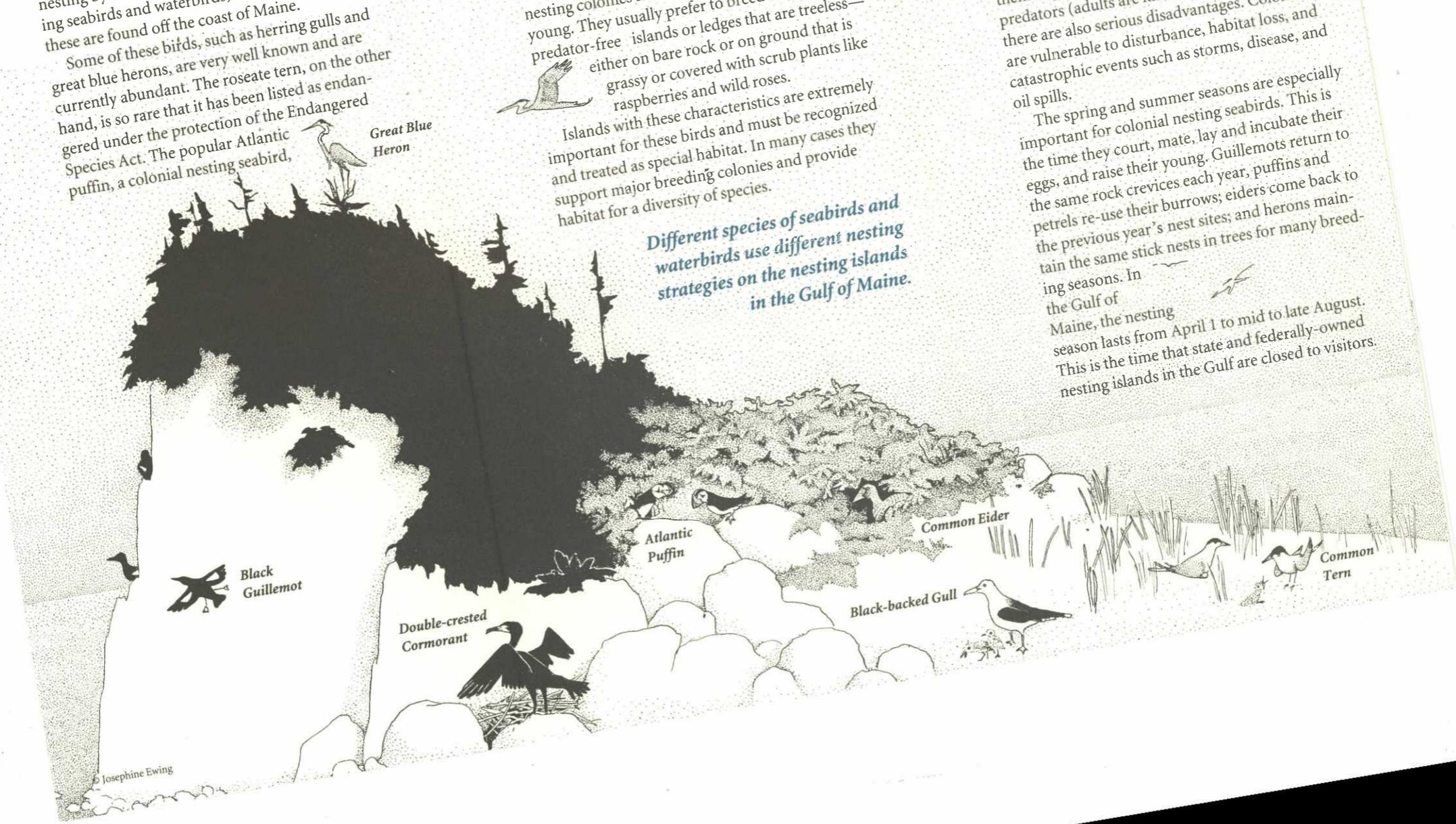
**Seabird Life** In general, colonial seabirds and waterbirds have long life spans (there is a record of a gull that lived over 30 years) and low reproductive rates (some of these species lay only one egg a year). Nesting populations fluctuate from year to year because of predation and changes in food 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.



**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



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**Cooperators:**

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

\* educational opportunities available

## General Guidelines

There 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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