

Chapter 4



Seaside sedge
USFWS photo

Management Direction

- Introduction
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Introduction

This CCP includes an array of management actions intended to achieve the Refuges' purposes, the vision and goals for the Refuge, and Gulf of Maine, State, and regional conservation plans. In our opinion, these actions effectively address the significant issues identified in the Draft and Final EIS. We also believe this CCP represents a plan that is reasonable, feasible, and practicable.

In all program areas, this CCP will enhance the quality and sustainability of current resource programs, develop long-range and strategic step-down plans, promote partnerships, and restore habitats for species of management concern. The protection, management, and restoration of seabirds will remain our top priority (Goal 5). We will increase our responsibility in promoting nesting seabird conservation in the Gulf of Maine by establishing six new seabird restoration projects over the next 15 years. In addition, our other priority biological programs will become more focused to benefit species of concern, namely migratory land birds, waterfowl and shorebirds. We will continue the vegetation management programs on Petit Manan Point and the islands, using a combination of treatments such as mechanical, prescribed fire, herbicides, and sheep grazing, as necessary. In addition, we will strengthen our biological inventory and monitoring program to allow us to better evaluate our programs and make more informed decisions.

We will increase our land acquisition and cooperative land protection program, including the 467 acres within our currently approved boundary, and an expansion of 87 nationally significant coastal nesting islands (2,306 acres), and 2 mainland tracts (153.3 acres) important to migratory waterfowl and shorebirds (See Land Protection Plan, Appendix A). All 87 islands have active nesting by Federal- and State-listed species and/or other species of concern, including: roseate tern, bald eagle, Atlantic puffin, common tern, Arctic tern, and razorbills. In addition to Service acquisition, we will

work with MDIFW, other GOMSWG members, and land conservation partners to support their efforts to protect additional active and potential nesting sites. It is through this cooperation that we could best achieve the goal of protecting well-distributed bald eagle, seabird, wading bird, and waterfowl nesting islands throughout the Gulf of Maine.

We will increase opportunities for priority wildlife-dependent public uses, especially in environmental education and interpretation. We will provide environmental education teacher and student workshops using the Refuge mainland divisions as a field classroom. We will provide interpretive panels at strategic locations along coastal Route 1, and place Service



Herring gull
USFWS photo

interpreters on board commercial tour boats. We will develop an interpretive trail and parking area at both the Gouldsboro Bay and Sawyers Marsh divisions, and a trail and observation platform at the Corea Heath Division. Our hunt program will be expanded to include a new white-tailed deer hunting opportunity on the Petit Manan Point Division. We expect an increase in visitation of approximately 15-20% over current levels with implementation of these programs. This increased use will occur primarily on the mainland divisions. Maps 4-1 to 4-4 at the end of this chapter, depict our existing and proposed infrastructure on the four mainland divisions.

We will enhance local community outreach and partnerships, continue to encourage our Friends Group, and improve our relationships with our neighbors and elected officials. We believe these efforts will strengthen support for natural resource conservation in the local communities we serve.

Finally, this CCP includes our recommendation to our Director that we pursue Federal wilderness designation on 13 Refuge islands, which we have grouped into 8 wilderness study areas. Our management of these islands will not change appreciably over how we manage them currently. We have no management activities planned that will be affected by this designation. We believe these islands could be an important addition to the National Wilderness Preservation System.

General Refuge Management

Invasive and Exotic Plant Management

Controlling invasive and exotic plant populations is a priority for the Refuge System. National and regional teams of experts and managers have convened to deal with this issue. Fortunately, on the Refuge and to the best of our knowledge, invasive and exotic plants, while present, are not presently a huge threat to native biodiversity and ecosystem function on the mainland or islands. Nevertheless, we recognize the need to remain vigilant to prevent their expansion, especially to new areas. As a group, these plants tend to be aggressive in establishing themselves and require frequent and thorough treatments to control them. We will provide active management to control their presence and spread, through the selected treatments including, mechanical, chemical, biological, fire, and livestock grazing.

Machias Seal Island Coordination

Machias Seal Island has some of the highest numbers and diversity of nesting seabirds of any island in the Gulf of Maine. While we identified in Chapter 2 that sovereignty of this island is an issue between the U.S. and Canadian governments, this has not diminished the strong partnership between the Canadian Wildlife Service, MDIFW, and Refuge staff to protect these nesting seabirds. Annual meetings are held to discuss public use, seabird research, and the results of surveys. We will continue our active involvement in this partnership.

**Native American
Coordination**

Within three years of CCP approval, we will develop a partnership agreement to establish a mutually beneficial working relationship with interested Wabanaki Tribes that includes cooperating in: the identification, inventory, and protection of cultural resources; developing environmental education and interpretative programs using oral and written sources; youth programs; sharing of technical expertise; or any other programs of mutual interest.

**Coast Guard
Coordination**

Within two years of CCP approval, we will develop a Memorandum of Understanding (MOU) with the U.S. Coast Guard. This MOU will be designed to facilitate their maintenance and protection of navigational equipment on Refuge lands, including access to these sites.

**Protecting and
Managing Cultural
Resources**

We take seriously our responsibility to consider the effects of our actions on archeological and historic resources. We will comply with Section 106 of the National Historic Preservation Act before disturbing any ground. Compliance may require any or all of the following: review of State Historic Preservation Office records, consultation with Native American Tribal Historic Preservation offices, a literature survey, or field survey.

In addition, we will continue our program to maintain historic lighthouses and/or associated structures to at least minimum national historic preservation standards. The Service is responsible for maintaining historic structures on Petit Manan Island (light keepers dwelling and outbuildings), Matinicus Rock (lighthouse, light keepers dwelling, and outbuildings) and the fog signal buildings and lighthouses on Libby Island and Egg Rock.

As noted under Objectives 7.1 and 7.3, we will be acquiring additional refuge lands. However, we are not purposefully seeking to acquire any more historic structures with these purchases, except as necessary to protect Federal trust resources.

**Maintaining Water
Impoundments on Petit
Manan Point Division**

There are three connected freshwater impoundments on Petit Manan Point Division covering approximately 112 acres. The water control structures will be maintained to provide stopover and foraging habitat for fall migrating waterfowl, wading birds, and shorebirds. The impoundments require minimal maintenance and are particularly valuable for fall migrating waterfowl, including black duck, because they provide freshwater and forage in close proximity to the coastline. They consistently hold thousands of fall migrating ducks which move through continuously until the water is frozen.

**Refuge Revenue
Sharing Payments**

We will continue annual refuge revenue sharing payments to the 20 Maine coastal towns in which Refuge lands are located. Future increases in payments will be commensurate with increases in the appraised values of Refuge lands, new acquisitions of land, and the level of Congressional appropriations.

Refuge Headquarters and Coastal Education Center

We will continue to pursue the idea of a new Refuge Headquarters and Coastal Education Center in the mid-coast area. We will work with our partners, including National Audubon Society, Maine Audubon Society, the Friends Group, and MDIFW to establish a vision, agree on conceptual design criteria for the education facility, and explore possible site locations. Our preliminary discussions included ideas that the center could provide such things as interpretive exhibits, trails, and staff- and volunteer-led environmental education and interpretive programs. Once a conceptual idea of the center is developed, and we have some prospective sites to evaluate, we will proceed with a separate environmental assessment, including public involvement, before a final decision is made.

Technical Assistance to Landowners

We will continue to provide technical assistance to landowners interested in enhancing or protecting their lands for wildlife. During public scoping, many people stated that this is an important community service provided by the Refuge staff that should continue.

Partnerships

We support partnerships to the fullest extent possible. These are vital to successfully managing all aspects of the Refuge, from land protection to habitat and species management, to public use activities. We listed many of our valuable partners in Chapter 1 and 3, but we will also pursue new ones of mutual interest and benefit to Refuge goals and objectives.

Friends Group Support

We will continue to support the Friends of Maine Seabird Islands association which has recently formed in the Rockport area. Their focus is on outreach and advocacy for the Refuge's seabird restoration and island protection program and the proposed coastal education center. We anticipate this group will provide us with valuable assistance in implementing our CCP. Similarly, we will seek opportunities to create a second Refuge Friends Group in down-east Maine.

Volunteer Opportunities

We will continue our successful volunteer program. Thousands of hours of work have been accomplished by volunteers who perform administrative, public use, and biological duties. This program has enhanced our ability to complete many tasks associated with refuge management.

Special Use Permits (including Research and Commercial Activities)

Requests for special use permits will be evaluated for appropriateness and compatibility on a case-by-case basis by the Refuge Manager. At a minimum, all commercial activities and all research projects require special use permits. Existing, compatible, and approved special use permits will continue to be allowed. In the future, research projects that will improve and strengthen natural resource management decisions on the Refuge will be encouraged. Research on species of concern and their habitats will continue to be a priority. The Refuge Manager may also consider research not directly related to refuge objectives, but which contributes to the broader

enhancement, protection, or management of native species and biological diversity within the region and beyond.

We will promote partnerships with local universities and colleges, USGS and other Federal and State research agencies. The Refuge Manager will determine on a case-by-case basis whether they can directly support a project through funding in-kind services (e.g. housing or use of other facilities), field assistance, or through sharing data and records.

All researchers on refuges, current and future, will be required to submit a detailed research proposal following Service policy in the FWS Refuge Manual, Chapter 4, Section 6. Special use permits must also identify a schedule for progress reports (at least annual), criteria for determining when a project should cease, and publication or other final reporting requirements. Multi-year projects should be established under a cooperative agreement. The Regional Division of Natural Resources, other Service divisions, and State agencies will be asked to review and comment on research proposals. Research results will be shared within the Service, with MDIFW, and elsewhere as appropriate.

Some projects, such as depredation and banding studies, require additional Service permits.

These projects will not be approved until all the Service permits and Endangered Species Act consultation requirements are met. Also, to maintain the natural landscape of Refuge lands, any proposals for permanent or semi-permanent structures will not be allowed, except under extenuating circumstances such as seasonal camps for future restoration projects.

Refuge Goals, Objectives and Strategies

As we described in Chapter 2, developing goals for the Refuge was one of the first steps in our planning process. Our goals are intentionally broad, descriptive statements of desired future condition for Refuge lands. By design, they are not quantitative, but are more prescriptive in defining the targets of our management. They also articulate the principal elements of refuge purposes and our vision statement, and provide the foundation for developing specific management objectives.

After developing our goals, we considered a wide range of possible management objectives that would help us meet them. Essentially, objectives are incremental steps we take to achieve a goal and they further define the management targets in measurable terms. Objectives provide the basis for determining more detailed strategies, monitoring refuge accomplishments, and evaluating our successes. Service guidance in “Writing Refuge Management Goals and Objectives: A Handbook (November 2003)” recommends that objectives possess 5 properties. They should be: 1) specific; 2) measurable; 3) achievable; 4) results-oriented; and 5) time-fixed. Together these properties constitute the acronym referred to as “SMART” objectives.

The objectives we considered ranged from those that require only a minimum level of funding and staffing, to those that would require a considerable increase in funding, staffing, infrastructure, and partnership development. Some of our objectives directly relate to habitat management, while others strive to meet population targets tied to recovery plans, regional, or Gulf of Maine species and habitat goals. With each objective statement, we provide a background narrative so you can understand its context and why we think it's important. The objectives of this CCP will be used directly in respective Refuge step-down plans, including the Habitat Management and Visitor Services plans, which are described further in Chapter 5. Our successes will be based on how well we achieve our objectives.

Goal 1: Perpetuate the Biological Diversity and Integrity of Upland Cover Types on the Refuge's Mainland to Sustain High Quality Habitat for Migratory Birds

Objective 1.1 (Blueberry Barrens - Old Field)

On the Petit Manan Point Division, maintain 70 acres of blueberry barren and old field to provide nesting and migratory habitat for landbirds of high conservation priority in PIF Area 28, such as bobolink, American woodcock, and whimbrel.

Background: The Partners in Flight (PIF) Landbird Conservation Plan for Physiographic Area 28 (Eastern Spruce-Hardwood Forest; June 2000) has identified the need to maintain blueberry barrens and active agricultural land to provide breeding habitat for the species noted above which are all documented on Petit Manan Point. This plan also acknowledges that this cover type contributes to the overall avian richness of Area 28; an area which is dominated by spruce-fir forest. In this PIF area, there is particular concern with bobolink which have been declining significantly (~3%/ year). American woodcock, which depend on old fields and clearings for courtship displays in the spring, are also declining at a rate of 2-3% per year. Compared to other PIF physiographic areas, Area 28 supports the highest relative abundance of breeding American woodcock. The decline of species dependent on open fields is closely correlated with the recent trends of

increased residential and commercial development and the declining interests in agriculture; each resulting in a reduction of grasslands, open fields, and pastures within Maine.

We have a Monitoring Avian Productivity and Survivorship (MAPS) station in this cover type on Petit Manan Point which has been in place five years. The emphasis in the MAPS program is to focus on demographic parameters such as Neotropical landbird survival and productivity rates, in an effort to identify factors that may be causing population fluctuations. The MAPS program methodology provides annual indices of adult population size and post-fledging productivity using data on the numbers and proportions of



Hooded warbler
USFWS photo

young and adult birds captured; and, annual estimates of adult survivorship, adult population size, proportion of resident individuals in the adult population, and recruitment into the adult population from mark-recapture data on adult birds (DeSante et. al. 2001). This information would supplement the significant effort spent across the United States in conducting Breeding Bird Surveys to determine population size and trends. Our results from this station indicate this station is incredibly rich in species diversity and is also highly productive.

In addition to providing breeding habitat, these open fields provide important foraging habitat for migratory birds during spring and fall migration. Most migratory birds rely on seeds, fruits, and insects to sustain them through migration (Blake and Hoppes 1986). While difficult to quantify, the foraging habitat provided during migration is considered a vital component of the overall habitat quality. Opportunities to improve the fields for seed, fruit and insect production are important in managing this cover type. In addition, we need to remain vigilant with regards to invasive and exotic plants. While not presently a concern, we must continue to be watchful of their presence and work actively to prevent their establishment.

Finally, this cover type supports our efforts to achieve Objective 6.5; that is, the open fields provide high quality, accessible wildlife viewing opportunities.

Strategies:

- continue annual woodcock surveys on Petit Manan Point.
- continue MAPS and Regional landbird surveys according to their respective protocols to determine nesting and migratory landbird response to habitat management. Conduct respective surveys as often as needed to monitor population trends confidently. Incorporate data into GIS database.
- as identified in Fire Plan EA and annual burn plan, continue to burn field units on a three-to-five-year rotation using the 11 burn unit configuration. Combine prescribed fire with mowing or other mechanical treatments, herbicides, and/or biological treatments to maintain desirable structure and control invasive plants.

Within 5 years of CCP implementation:

- review and revise existing cover-type map for Petit Manan Point Division and incorporate into a GIS database.
- in the HMP, include strategies to manage this cover type to provide the best mix and configuration of age classes and structural diversity to benefit nesting and migratory birds across the landscape. Consider the most appropriate management of age classes given the surrounding land ownership and management and what refuge lands can uniquely sustain over time. Utilize vegetative treatments such as mechanical, biological, chemical, and prescribed fire, where appropriate, to manage desirable vegetation and to control invasive and exotic plants. Refine objectives as needed with new information gained from revised cover type mapping.



Prescribed burning
USFWS photo

- Up to 110 acres could be prescribed burned in any given year across the refuge to achieve this and other habitat objectives. Consult with Regional Fire Management Officer when developing prescribed fire management prescriptions.
- participate in the Atlantic Northern Forest Bird Conservation Region Planning efforts, the PIF Working Group, and other regional landscape-scale efforts to review and evaluate the Refuge's contribution to the habitat and population objectives identified in regional, state, PIF, and species-specific plans. Update HMP as needed.

- in HSIMP, include monitoring for exotic and invasive vegetation on an annual basis.
- hire a Wildlife Biologist (GS 9) to help collect and manage field data.

Objective 1.2 (Northern Hardwood-Mixed Forest)

Maintain 1,090 total acres of northern hardwood-mixed forest habitat (453 acres on the Petit Manan Point Division; 123 acres on Gouldsboro Bay Division; 455 acres on the Sawyers Marsh Division; and 59 acres on Corea Heath Division), to provide nesting habitat for landbirds of high conservation priority within PIF Area 28 such as black-throated blue and Canada warblers.

Background: The northern hardwood-mixed forest is usually dominated by sugar maple, beech, birch, and white pine. Similar to the open field habitat in Objective 1.1, this cover type provides valuable habitat for nesting land birds, including the Federal-listed bald eagle, as well as foraging and resting habitat for migrating land birds. According to the PIF Plan for Area 28, the importance of this habitat type is considerable because of the number of associated bird species with high proportions of their total population in the planning unit. Of particular note is the fact that nearly 25% of the world's black-throated blue warblers are estimated to breed in Area 28. A majority of high priority species in this habitat, including the black-throated blue and Canada warblers, are dependent on a relatively dense forest understory for foraging and nesting. To benefit migrating birds, the PIF Plan recommends maintaining a balance of forest age structures, including mid-successional and late-successional forest, and providing structural diversity (shrubs and treefall) within the forest.

We have had a MAPS station for five years in this cover type at Petit Manan Point Division and for three years at Gouldsboro Bay Division. Our results indicate that this habitat type is consistently utilized by the species

of concern noted in the objective statement. We are not recommending any vegetation management at this time to enhance this habitat for a certain species. We believe several more years of MAPS monitoring is desirable to establish trend and preferences at these sites.

Strategies:

- continue to participate in the Atlantic Northern Forest Bird Conservation Region planning efforts; incorporate specific strategies into HMP as warranted
- continue annual MAPS survey on the Petit Manan Point Division and Gouldsboro Bay Division, and annual Regional landbird surveys on Petit Manan Point, Sawyers Marsh and Gouldsboro Divisions according to respective protocols to determine nesting landbird response. Evaluate data on an annual basis. Conduct respective surveys as often as needed to establish trend information. Incorporate data into GIS database. By 2006 season, determine whether to expand MAPS survey to Sawyers Marsh Division.
- continue to cooperate with MDIFW in annual monitoring for bald eagle occupancy and productivity at the bald eagle nest located in the Gouldsboro Bay Division.
- continue to update, as needed, the cover type map for Petit Manan Point, Sawyers Marsh and Gouldsboro Bay divisions. Incorporate updates into a GIS database.

Within 5 years of CCP implementation:

- in HMP, include strategies to manage these forest stands to minimize fragmentation and provide the best mix of forest age class and structural diversity to benefit nesting and migratory birds across the landscape. Consider the most appropriate management of age classes given the surrounding land ownership and management and what refuge lands can uniquely sustain over time. Utilize vegetative treatments such as mechanical, biological, chemical, and prescribed fire, where appropriate, to manage desirable vegetation and to control invasive and exotic plants. Refine objectives as needed with new information and the new and revised cover type mapping.
- participate in the Atlantic Northern Forest Bird Conservation Region Planning efforts, the PIF Working Group, and other regional landscape-scale efforts to review and evaluate the Refuge's contribution to the habitat and population objectives identified in regional, state, PIF, and species-specific plans. Update HMP as needed.
- in HSIMP, include monitoring for exotic and invasive vegetation on an annual basis.
- hire a Wildlife Biologist (GS 9; same position as Objective 1.1)

Objective 1.3 (Mature Red Spruce-Balsam Fir Forest)

Maintain 1,690 total acres of mature conifer forest habitat (905 acres on the Petit Manan Point Division; 253 acres on Gouldsboro Bay Division; and 403 acres on Sawyers Marsh Division), to provide nesting habitat for landbirds of high conservation priority within PIF Area 28 such as bay-breasted warbler, Cape May warbler, and spruce grouse.

Background: This mature conifer forest habitat is usually dominated by red spruce and balsam fir. The PIF Plan for Area 28 identified the need for conservation lands to maintain a large percentage of land area in mature (> 50 years old) red spruce and balsam fir to offset those private lands under intensive forest management. Although conifers dominate a large percentage of Maine's forests, the forest industry has favored shorter harvest rotations which has created younger, even-aged forested stands that are more monotypic and have less structural and age-class diversity compared to older stands. These younger, even-aged forests typically have a lower supply of downed and standing dead wood, more uniform vertical structure and canopy gaps, and a highly altered plant and animal composition (Elliott 1999). Each of these characteristics reduces the quality of nesting, foraging, and migratory habitat for landbirds of high conservation priority within PIF 28.

Strategies:

- continue to participate in the Atlantic Northern Forest Bird Conservation Region planning efforts; incorporate specific strategies into HMP as warranted
- continue annual MAPS survey on the Petit Manan Point Division, and annual Regional landbird surveys on Petit Manan Point, Sawyers Marsh and Gouldsboro Bay divisions according to respective protocols to determine nesting landbird response. Conduct respective surveys as often as needed to establish trend information. Incorporate data into GIS database. By 2006 determine whether to expand MAPS effort to Sawyers Marsh Division.
- continue to cooperate with MDIFW in annual monitoring for bald eagle occupancy and productivity immediately upon discovering an eagle nest in this habitat type (none are known on Refuge mainland properties at this time).

Within 5 years of CCP implementation:

- revise cover type map for the Petit Manan Point, Sawyers Marsh and Gouldsboro Bay divisions. Incorporate information into a GIS database.
- in HMP, include strategies to manage these forest stands to minimize fragmentation and provide the best mix of forest age class and structural diversity to benefit nesting and migratory birds across the landscape. Consider the most appropriate management of age classes given the surrounding land ownership and management and what refuge lands can

uniquely sustain over time. Utilize vegetative treatments such as mechanical, biological, chemical, and prescribed fire, where appropriate, to manage desirable vegetation and to control invasive and exotic plants.

Refine objectives as needed with new information and the new and revised cover type mapping.



Cedar waxwing - MAPS survey
USFWS photo

- participate in the Atlantic Northern Forest Bird Conservation Region Planning efforts, the PIF Working Group, and other regional landscape-scale efforts to review and evaluate the Refuge's contribution to the habitat and population objectives identified in regional, state, PIF, and species-specific plans. Update HMP as needed.
- in HSIMP, include monitoring for exotic and invasive vegetation on an annual basis.
- hire a Wildlife Biologist (GS 9; same position as Objective 1.1)

Objective 1.4 (Early Successional Forest-Edge)

On the Petit Manan Point Division, annually manage the 226 acres in early successional forest/edge habitat dominated by speckled alder (*Alnus rugosa*), mountain ash (*Prunus americana*), sweet gale (*Myrica gale*) and other shrubs, approximately 2-10' tall, to provide nesting and feeding habitat for landbirds of high conservation priority within PIF Area 28 such as chestnut-sided warbler, American woodcock, and olive-sided flycatcher.

Background: Within PIF Area 28, this habitat was historically created from natural disturbances such as fire, flooding, beaver activity, or severe storms or occurs as a relatively short-lived vegetation stage after agricultural abandonment or logging (Rosenberg and Hodgman 2000). In general, current land management practices strive to avoid these disturbances and, as a result, this habitat type and many landbirds associated with it are in decline throughout PIF Area 28.

Particular attention has focused on the 2-3% per year decline of American woodcock which has occurred since 1968. While woodcock utilize a variety of habitats depending on the season and activity, they utilize early successional forest/edge habitat for foraging, daytime cover, and nesting. Chestnut-sided warbler and olive-sided flycatcher are two other landbird species of high conservation priority which utilize this habitat for nesting.

In addition to nesting, this habitat provides important foraging areas for migratory birds during spring and fall migration. As noted above, most migratory birds rely on seeds, fruits, and insects to sustain them through migration. Opportunities to manage early successional /edge habitat to increase seed, fruit and insect production will be an important consider-

ation. Active management will be necessary to maintain this habitat type; otherwise, over time, much of the upland areas will grow into a spruce-fir forest. However, wetland areas will likely remain as shrub habitat. In addition, we need to remain vigilant with regards to invasive and exotic plants. While not presently a concern, we must continue to be watchful of their presence and work actively to prevent their establishment.

Strategies:

- continue annual MAPS survey and annual Regional landbird surveys on the Petit Manan Point Division according to respective Regional protocols to determine nesting landbird response. Conduct respective surveys as often as needed to establish trend information. Incorporate data into GIS database.

Within 5 years of CCP implementation:

- revise cover type map for the Petit Manan Point Division and incorporate information into GIS database.
- in HMP, include strategies for managing early successional forest/edge habitats to provide the best mix of structural diversity to benefit nesting and migratory birds. Consider the most appropriate management of age classes given the surrounding land ownership and management and what refuge lands can uniquely sustain over time. Utilize vegetative treatments such as mechanical, biological, chemical and prescribed fire, where appropriate, to manage desirable vegetation and to control invasive and exotic plants. Refine objectives as needed with new information and the revised cover type mapping.
- Up to 110 acres could be prescribed burned in any given year on refuge lands to achieve this and other objectives. Consult with Regional Fire Management Officer when developing prescribed fire management prescriptions.
- participate in the Atlantic Northern Forest Bird Conservation Region Planning efforts, the PIF Working Group, and other regional landscape-scale efforts to review and evaluate the Refuge's contribution to the habitat and population objectives identified in regional, state, PIF, and species-specific plans. Update HMP as needed.
- in HSIMP, include monitoring for exotic and invasive vegetation on an annual basis.
- hire a Wildlife Biologist (GS 9; same position as Objective 1.1)

Objective 1.5 (Rare Plant Sites)

On the Sawyers Marsh, Gouldsboro Bay, Petit Manan Point, and Corea Heath divisions, manage rare plant sites to insure their population viability is sustained over time and they continue to contribute to the natural botanical diversity of the area.

Background: Botanical surveys to date have identified five rare plants: swarthy sedge (*Carex adusta*), salt-marsh sedge (*Carex recta*), Nova Scotia false-foxglove (*Agalinis neoscotica*), Pickering's reed bent-grass (*Calamagrostis pickeringii*; State threatened), and moonwort (*Botrychium lunaria*) on the Petit Manan Point Division (see Appendix B for TNC and Maine Natural Area ranking of each species). All five species of plants are considered imperiled in Maine because of their rarity or vulnerability to further decline. One species, Nova Scotia false-foxglove, is also thought to be imperiled globally. Very little is known about their life history requirements and what protection measures are most effective to insure their continued viability. Additional surveys are needed on the Petit Manan Point Division to verify each population's extent and distribution.

We also need to establish what external threats could impact these plants populations. Moreover, we must remain vigilant with regards to invasive and exotic plants. While not presently a concern, we must continue to be watchful of their presence and work actively to prevent their establishment or spread.

Also on Petit Manan Point is an 11-acre Jack pine (*Pinus banksiana*) woodland; a rare plant community in the state. This stand provides a unique and important contribution to the ecological diversity of the area as it is one of only eight sites in the state (Elliott, 1999). Jack pine regenerates best through fire, which consumes the organic matter and exposes a more suitable seedbed of mineral soil (Maine NAP, 1983).

Rare plant surveys have not been initiated on Sawyers Marsh or Gouldsboro Bay Divisions; however, our proposal is to conduct further surveys beginning in 2005. With identification of rare plant populations at these two locations, our concerns would be similar to those addressed for Petit Manan Point.

Several studies have been conducted on the Corea Heath Division and have determined it is an exemplary coastal plateau bog ecosystem. The entire area is considered unique botanically, and is State-designated as a Maine Critical Area. It is recognized as one of the largest and most southerly coastal raised peatlands in North America. The adjacent jack pine stand is also a Maine Critical Area.

The core 240-acre bog (or peatland) complex on Corea Heath division is actually comprised of several smaller peatland communities, including open and forested bogs, and open and forested fens. Fortunately, the U.S. Navy preserved and protected Corea Heath for more than 50 years, by limiting infrastructure developments and not allowing public access. According to information we obtained from the State of Maine Natural Areas Program database, the State-listed threatened plant, Pickerings reed bent-grass occurs here. Two other rare species are suspected in the area: screwstem (*Bartonia paniculata*), as State threatened species, and Wiegand sedge (*Carex wiegandii*), a State species of special concern.

Strategies:

Within 5 years of CCP implementation:

- compile what is known about rare plant life history requirements for the species that have been identified on the Refuge through consultation with botanical experts and literature reviews.
- initiate rare plant surveys on Sawyers Marsh and Gouldsboro Bay Divisions.
- identify location and extent of known populations with GPS, quantify numbers, and identify potential threats, incorporate information into a GIS database; re-establish locations of known plants on Corea Heath Division.
- in HMP, include strategies to manage the health and productivity of these plant populations. Encourage research studies of the viability and persistence of these rare plant populations, emphasizing patterns of reproductive success and limitations imposed by rare plant habitats. Consider use of deer exclosures to help assess effect of feeding on rare plant sites. Consider restricting public access in sensitive areas. Implement survey efforts to locate additional rare plant communities. Utilize vegetative treatments such as mechanical, biological, chemical, and prescribed fire, where appropriate, to manage desirable vegetation and to control invasive and exotic plants before they become established. Refine objectives as needed with new information and the revised cover type mapping.
- Up to 110 acres could be prescribed burned in any given year to achieve this and other objectives. Consult with Regional Fire Management Officer when developing prescribed fire management prescriptions.
- in HSIMP, include monitoring strategies for exotic and invasive vegetation on an annual basis. Establish survey protocol to locate additional rare plant populations. Develop a deer monitoring strategy if warranted.

Goal 2: Maintain High Quality Wetland Habitat on the Refuge's Mainland Coast, Primarily to Benefit Migratory Birds of High Conservation Priority, while also Supporting other Native, Wetland-Dependent Species of Concern

Objective 2.1 (Maritime Saltmarsh and Estuary)

On the Gouldsboro Bay and Petit Manan Point Divisions, maintain the 28 and 8 acres, respectively, of coastal saltmarsh to insure the quality and natural function of the marsh is sustained and providing breeding and/or wintering habitat for species of conservation concern such as Nelson's sharp-tailed sparrow, American black duck, and northern harrier.

Background: Historically, over 90% of saltmarshes in the northeast were parallel-grid ditched by 1938 for mosquito control (Bourn and Cottom 1950). Within PIF Area 28, the most extensive saltwater marshes occur in Canada and these were largely altered through diking for waterfowl production and draining for agriculture. In Maine, salt hay farming was a threat and currently, residential and industrial development are other significant impacts affecting these fragile systems. The PIF Area 28 plan

has identified two species of concern on which to focus conservation efforts: Nelson's sharp-tailed sparrow and American black duck. Other Regional species of concern include northern harrier and migrating shorebirds.

The PIF Area 28 plan ranks Nelson's sharp-tailed sparrow as the highest overall conservation priority, primarily due to its very restricted range and small total populations. Nearly the entire range of the Nelson's sharp-tailed sparrow occurs in PIF Area 28. Unfortunately, its status and habitat requirements are poorly known. It is assumed to breed almost entirely in coastal and estuarine marshes in this area.

The American black duck is a globally vulnerable Watch List species with a large proportion of its range within PIF Area 28. It is considered one of the highest priority species of concern according to the Atlantic Coast and Eastern Habitat Joint Ventures and among the state and provincial agencies where it occurs. Coastal saltmarshes provide breeding habitat for this species, and coastal marshes, estuaries, and sheltered coves are especially important to wintering black ducks (PIF Plan Area 28 plan) for foraging and shelter. Numerous other species of wading birds, waterfowl, and shorebirds also utilize the saltmarshes as feeding areas during the breeding and migration seasons.

Fortunately, the salt marsh habitats on refuge lands are relatively undisturbed. While historic salt haying occurred, all dams associated with this activity have been breached and do not impede natural tidal fluctuations. As such, our management of these areas has been more custodial, limited to monitoring human activities and wildlife use.

Strategies:

- continue to seek acquisition of the 95 acre Sawyer's Marsh tract from willing sellers, which is the remaining inholding in this division.

Within 5 years of CCP implementation:

- in HMP, include strategies to maintain high quality marsh habitat over time. Identify and evaluate threats to the saltmarsh. Utilize vegetative treatments such as mechanical, biological, chemical and prescribed fire, where appropriate, to manage desirable vegetation and to control invasive and exotic plants. Refine objectives as needed with new information and the revised cover type mapping.
- conduct saltmarsh sparrow surveys according to Regional protocol.
- utilize the Global Programme of Action Coalition protocol (USGS) to monitor and evaluate saltmarsh quality and natural function.
- participate in the Atlantic Northern Forest Bird Conservation Region Planning efforts, the PIF Working Group, and other regional landscape-scale efforts to review and evaluate the Refuge's contribution to the

habitat and population objectives identified in regional, state, PIF, and species-specific plans. Update HMP as needed.

- in HSIMP, include monitoring strategies for exotic and invasive species on an annual basis.
- initiate surveys to document use of the Refuge saltmarshes as feeding areas for species of concern during the breeding and migration seasons.

Objective 2.2 (Freshwater Impoundments)

On the Petit Manan Point Division, annually manage the three freshwater wetland impoundments (i.e., Meadow Brook, Mague, and Cranberry) comprising 112 acres, with at least 20 acres of wild rice, to provide high quality feeding and resting habitat during fall migration (September to December) for waterfowl such as American black duck, mallard, northern pintail, and green-winged teal.

Background: Freshwater wetlands throughout Maine have declined from historic levels following hydropower development or conversion to support agricultural, commercial, industrial, and residential development. Currently, the freshwater wetlands on the Petit Manan Point Division provide stop-over habitat for thousands of waterfowl who continuously move through during their fall migration (September to December). In particular, Cranberry Flowage currently receives considerable use during the fall due to the extensive stands of wild rice.

Since there is no public access to Mague and Cranberry impoundments, and no hunting is allowed here, very little disturbance occurs near these freshwater impoundments. As a result, migratory waterfowl are provided with a high quality food source in a relatively undisturbed environment.

As noted in Objective 2.1, the American black duck is a species of high conservation priority that utilizes these wetlands not only during migration, but will use them in conjunction with nesting in the adjacent uplands.



Ducks flying off Cranberry Marsh, a freshwater impoundment on Petit Manan Point Division
USFWS photo

In addition to waterfowl, these freshwater wetlands provide migratory habitat for shorebirds, and nesting and foraging habitat for other species of conservation concern, such as belted kingfisher, northern harrier, northern goshawk, peregrine falcon, and waterbirds such as American and least bittern (USFWS 1995). Unfortunately we do not have extensive information on these species and their use of the impoundments. In particular, the secretive nature of bittern and other marsh and wading birds, and the inaccessibility of their preferred habitat, make it difficult to monitor their population levels. We recognize that the standardized Breeding Bird Surveys are not adequate for

species which occur in inaccessible marshes. Baseline survey information will be utilized in the development or revision of our HMP and in evaluating property for potential land acquisition. Efforts that will further the conservation of these species will be considered a priority during management of Refuge impoundments.

Finally, we need to remain vigilant with regards to invasive and exotic plants. While not presently a concern, we must continue to be watchful of their presence and work actively to prevent their establishment.

Strategies:

- continue to maintain the earthen dikes and culverts, and use beaver deceivers to insure the three impoundments on the Petit Manan Point Division sustain water levels each year for fall migratory waterfowl, water birds, and shorebirds. Manage furbearers as warranted when needed to protect infrastructure.

Within 5 years of CCP implementation:

- map and monitor the distribution of wild rice and other important native wetland vegetation according to Regional protocol; explore all possibilities to expand the distribution of wild rice into Mague Flowage.
- evaluate seasonal use of wetlands by waterfowl, raptors, marsh and wading birds, and shorebirds to potentially develop additional habitat objectives for these species in the HMP.
- include in HMP, strategies to maintain high quality freshwater wetlands habitat over time. Identify and evaluate threats to the wetlands. Utilize vegetative treatments such as mechanical, biological, chemical and prescribed fire, where appropriate, to manage desirable vegetation and to control invasive and exotic plants. Refine objectives as needed with new information and the revised cover type mapping.
- participate in the Atlantic Northern Forest Bird Conservation Region Planning efforts, the PIF Working Group, and other regional landscape-scale efforts to review and evaluate the Refuge's contribution to the habitat and population objectives identified in regional, state, PIF, and species-specific plans. Update HMP as needed.
- include in HSIMP monitoring for exotic and invasive vegetation on an annual basis.
- participate in USFWS Region 5 anuran call count surveys in wetlands considered suitable for amphibians; document species occurrence and abundance and incorporate into GIS database.

Objective 2.3 (Vernal pool wetlands)

Protect all vernal pool habitat on the Refuge to insure no net loss or degradation of this important ecological community and to maintain breeding

habitat for amphibian species of conservation concern, such as wood frogs and spotted salamanders.

Background: In addition to the concerns with freshwater wetland-dependent species noted above, amphibians are also a significant concern. Not only are their populations in decline throughout the Northeast, but because of their physiological traits (e.g. permeable skin) and ecological traits (e.g. complex, two-phase life cycle), they serve as potentially excellent indicators of environmental health (Heyer et. al. 1994). They are sensitive to changes in water quality and quantity; certain types of habitat alteration; nutrient, chemical, and thermal pollution; and acidification of wetlands and forest habitats (Hine 1982 and Klemens 1993). Monitoring changes in their presence and abundance will help us determine if there are unhealthy environmental conditions.

Many of the amphibians of concern to the Refuge rely on vernal pool habitat during all or part of their life cycle. Unfortunately, this habitat type is not fully mapped on the Refuge nor have known sites been intensively surveyed to document the presence of amphibians during the breeding season. Successive surveys will be necessary to evaluate the effects of Refuge management actions on amphibian species diversity and abundance.

Strategies:

Within 5 years of CCP implementation:

- complete surveys of vernal pools on the mainland and determine the presence of amphibians during the breeding season. Specifically, participate in Regional anuran call count surveys in select vernal pools to document species occurrence, seasonal use, and abundance. Incorporate survey results into GIS database. Surveys will also monitor amphibian use of Refuge impoundments.
- determine the need for more intensive, species-specific monitoring after evaluating the results of anuran call count surveys.

Goal 3: Perpetuate the Biological Diversity and Integrity of Upland Cover Types on the Refuge's Coastal Islands to Sustain High Quality Habitat for Nesting Bald Eagles and Migratory Songbirds and Raptors, and to Protect Rare Plant Sites

Objective 3.1 (Bald Eagle Nesting Sites)

Protect the four active and four historic bald eagle nesting sites and maintain suitable habitat on another 15 islands with stands of mature red spruce/ balsam fir forests to maintain or increase the number of occupied bald eagle nesting territories within the Refuge.

Background: Bald eagles are Federal-listed as threatened by both the Federal government and the State of Maine. Initial threats to the species included environmental contaminants, shooting, habitat loss, and human disturbance at nest sites. Extensive public education efforts and Federal and state legislation have significantly reduced many of these threats (McCullough 1993). The bald eagle population in Maine has responded to this protection, and the state now supports over 275 pairs of eagles. However, MDIFW has identified permanent protection of eagle nesting areas as the top prior-

ity for the future recovery of this species in Maine. Bald eagles are actively nesting on Mink, Bois Bubert, Outer Heron, and Little Marshall islands and have historically nested on Sally, Cross, Double Head Shot, and Schoppee islands. One additional pair of eagles nests within the Gouldsboro Bay Division.

Within Maine, mature red spruce/balsam fir-dominated stands close to foraging habitats are considered preferred nesting habitat. Eagles have also nested in large hardwood or white pine trees that are dominant in the tree canopy. During the nesting season eagles are often sensitive to disturbance and will typically nest in areas with minimal human activity (Stalmaster 1987). If disturbed, adult bald eagles may flush from their nest leaving eggs and young chicks exposed to inclement weather (heat or cold) or susceptible to predation.

Strategies:

- continue to implement seasonal public access restrictions annually on the four active and four historic bald eagle nesting sites: historic eagle nesting islands are closed from Feb. 15 to May 15; active eagle nesting islands (or portions thereof) are closed from Feb. 15 to August 31.
- continue to evaluate annually the reproductive performance of eagles nesting within the Refuge and compare to statewide average; if possible, determine causes of decreased productivity and evaluate whether management actions are warranted.
- continue to evaluate annually all future land acquisition for potential to provide nesting habitat for bald eagles. Any additional bald eagle nest sites acquired in the future by the Service would receive the same level of protection as current Refuge islands.
- continue to support MDIFW's annual efforts to monitor occupancy and productivity at all bald eagle nest sites.

Objective 3.2 (Mature Red Spruce-Balsam Fir)

Maintain mature red spruce/balsam fir stands on Refuge islands, in particular, the 734 acres on Bois Bubert Island and 1,248 acres on Cross Island to provide nesting habitat for landbirds of high conservation priority within PIF Area 28 such as bay-breasted warbler, Cape May warbler, and spruce grouse.

Background: See Objective 1.3

Strategies:

Within 5 years of CCP implementation:

- in HMP, include strategies to manage these forest stands to minimize fragmentation and provide the best mix of forest age class and structural diversity to benefit priority nesting birds across the landscape. Consider



Cape May Warbler
USFWS photo

the most appropriate management of age classes given the surrounding land ownership and management and what refuge lands can uniquely sustain over time. Utilize vegetative treatments such as mechanical, biological, chemical and prescribed fire, where appropriate, to manage desirable vegetation and to control invasive and exotic plants. Refine objectives as needed with new information and the revised cover type mapping.

- use landbird survey data collected on the mainland divisions, and Breeding Bird Survey data collected on Cross Island, to evaluate relationship of PIF priority species to stand characteristics such as stand age and stand structure.
- update the cover type maps for Cross and Bois Bubert islands in digital form for use in habitat planning.
- participate in the Atlantic Northern Forest Bird Conservation Region Planning efforts, the PIF Working Group, and other regional landscape-scale efforts to review and evaluate the Refuge's contribution to the habitat and population objectives identified in regional, state, PIF, and species-specific plans. Update HMP as needed.
- in HSIMP, include monitoring for exotic and invasive vegetation on an annual basis.
- hire a Wildlife Biologist (GS 9; same position as Objective 1.1)

Objective 3.3 (Early Successional Forest/Edge)

Manage early successional forest/edge habitat dominated by species such as alder (*Alnus spp*) and cherry (*Prunus spp*) approximately 2-10' tall on Refuge islands, including the 320 acres on Bois Bubert Island, to provide nesting habitat for landbirds of high conservation priority within PIF Area 28 such as chestnut-sided warbler, American woodcock, and olive-sided flycatcher.

Background: See Objective 1.4.

Strategies:

Within 5 years of CCP implementation:

- in HMP, include strategies for managing early succession forest/edge field habitats to provide the best mix of structural diversity to benefit nesting and migratory birds. Consider the most appropriate management of age classes given the surrounding land ownership and management and what refuge lands can uniquely sustain over time. Utilize vegetative treatments such as mechanical, vegetation and to control invasive and exotic plants. Refine objectives as needed with new information and the revised cover type mapping.

- participate in the Atlantic Northern Forest Bird Conservation Region Planning efforts, the PIF Working Group, and other regional landscape-scale efforts to review and evaluate the Refuge's contribution to the habitat and population objectives identified in regional, state, PIF, and species-specific plans. Update HMP as needed.
- in HSIMP, consider the effects of deer browsing and incorporate a deer monitoring strategy if warranted. Include monitoring for exotic and invasive vegetation on an annual basis.
- hire a Wildlife Biologist (GS 9; same position as Objective 1.1)

Objective 3.4 (Migratory Landbirds)

Within 3 years of CCP approval, begin to evaluate at least three Refuge islands per year during spring (May and June) and fall (August to October) to determine their value to migratory landbirds of concern (e.g. black-throated blue, Canada, bay-breasted, and Cape May warblers, and raptors) to serve as a basis for future management decisions.

Background: Recent information indicates that coastal islands may play a key role in providing Neotropical migratory land birds with the optimal variety of prey items which are necessary to complete their migration (R. Suomala pers. comm.). Seabird researchers working on coastal islands have documented significant numbers and species of Neotropical migrants, including raptors using the islands during spring migration. Refuge specific information is not available for the fall. However, limited studies contracted by the Refuge indicate that a considerable number of raptors utilize off-shore islands as foraging areas during their fall migrations (Drury and Goodhue 1998). Survey efforts will be coordinated with those identified in objective 4.4.

Strategies:

Within 5 years of CCP implementation:

- evaluate opportunities to cooperate in ongoing University of New Hampshire study to determine foraging habitat preferences of migratory songbirds.
- implement Regional land bird inventory protocol to monitor spring (May and June) and fall (August to October) migratory bird use of Refuge islands.
- conduct spring and fall migratory Neotropical landbirds and raptor monitoring on at least three Refuge islands as necessary to determine their use of coastal habitats; utilize seabird management crews to survey between May-early August. Hire additional seasonal staff to conduct migratory raptor surveys during August-October.

Within 5 -10 years of CCP implementation:

- complete cover type mapping for island habitats; update HMP as needed.
- evaluate monitoring data to determine habitat characteristics preferred by these species and whether active management is warranted; revise or update objectives in HMP as needed.

Objective 3.5 (Baseline Biological Inventories)

Within 2 years of CCP approval, begin to complete botanical and wildlife evaluations on at least six Refuge islands per year to identify species of concern and to provide a baseline for making future management decisions.

Background: Few complete biological inventories have been conducted on offshore Maine islands, but we suspect there are many rare or unique species inhabiting them. Plants and animals living in the Gulf of Maine are uniquely adapted to cold water currents, the prevalence of fog in summer, and strong cold winds that typically occur off the Maine coast (Conkling 1999). Along the outer islands, this results in harsh environmental conditions similar to those in more Arctic or boreal regions. These conditions, which frequently are too harsh for some plants found on the mainland, give rise to a group of boreal species of plants that typically exist much farther north (Mittelhauser and Morrison 2000).

To date, botanical and wildlife inventories of Refuge islands have been completed for Libby, Johns, Eastern Brothers, Halifax, Petit Manan, and Upper Flag islands. A preliminary inventory of the Cross Island wetlands has also been completed. Bois Bubert has a cover type map completed. Future inventories will include a description of plant and resident wildlife species composition and relative abundance, GPS locations of sensitive plant and wildlife species habitats, locations of invasive or exotic species, and known or potential threats to the island's biological diversity.

Invasive plants are not presently a huge threat, but we will need to be vigilant so they do not become one. For example, we are controlling the population of invasive dodder (*Cuscuta spp.*) on Petit Manan Island where it has been found across the island. In some years the vine flourishes, forming a thick tangled mat, which may limit mobility of young tern chicks. We have mechanically removed the plant after the nesting season, and prior to seed production. Purple loosestrife (*Lythrum salicaria*) is also known to occur on Smuttynose Island. Our long-term goal of this program will be to identify invasive plant locations through these surveys, so we can immediately begin control where needed.



Buttercup
USFWS photo

Strategies:

Within 5 years of CCP implementation:

- establish protocol to conduct baseline vegetation and wildlife inventories on at least six Refuge islands per year. Efforts will continue until all Refuge islands have been inventoried. Consider use of contractors or initiate cooperative efforts with universities to conduct surveys. All survey information would be stored in a GIS database.
- conduct literature search to determine historical surveys conducted on, or adjacent to, Refuge islands.
- update HMP as needed using information obtained from inventories and develop strategies to insure resources of concern are protected.
- in HSIMP, include monitoring for exotic and invasive vegetation on an annual basis. Utilize vegetative treatments such as mechanical, chemical, biological, and prescribed fire to control exotic and invasive plants.
- complete digital cover type mapping for all forested Refuge islands.

Objective 3.6 (Rare Plant Communities)

Manage known rare plant populations on Refuge islands and mainland to insure these populations remain viable and contribute to the natural botanical diversity of the area.

Background: Botanical surveys to date have identified numerous rare plant populations on islands within the Refuge. These include Cross Island: livid sedge (*Carex livida*) and Coast blite goosefoot (*Chenopodium rubrum*); Eastern Brothers: northern yarrow (*Achillea millefolium*); Libby Island: saltmarsh sedge (*Carex recta*), bird's eye primrose (*Primula laurentiana*), and northern yarrow; Bois Bubert: Bird's eye primrose and Nova Scotia false-foxglove (*Agalinis neoscotia*); Halifax Island: northern yarrow; John's Island: sea-beach sedge (*Carex silicea*); Upper Flag Pitseed goosefoot (*Chenopodium berlandieri* var. *macrocalycium*). In addition, two rare plant communities have been identified on Refuge islands: maritime slope bog and jack pine woodland. These areas provide a unique and important contribution to the ecological diversity of the area. In particular, the 28-acre jack pine woodland on Bois Bubert Island is only one of eight in the state (Elliott, 1999). Jack pine regenerates best through fire, which con-

sumes the organic matter and exposes a more suitable seedbed of mineral soil (Maine NAP, 1983).

See Appendix B for The Nature Conservancy and Maine Natural Areas ranking of each species.

Strategies:

Within 5 years of CCP implementation:

- conduct literature search and consult experts regarding life history requirements.
- review baseline biological inventory information collected each year (See Objective 3.6) for occurrences of rare plants.
- annually coordinate all survey and management efforts with Maine Natural Areas Program (NAP).
- in HMP, include strategies to manage the health and productivity of these island rare plant populations and communities. Encourage research studies on the viability and persistence of these rare plant populations, emphasizing patterns of reproductive success and limitations imposed by rare plant habitats. Consider use of exclosures if sheep could be impacting rare plants. Also, consider restricting public access in sensitive areas. Utilize vegetative treatments such as mechanical, biological, chemical and prescribed fire, where appropriate, to manage desirable vegetation and to control invasive and exotic plants. Refine objectives as needed with new information and the revised cover type mapping.
- Up to 110 acres could be prescribed burned in any given year to achieve this and other habitat objectives. Consult with Regional Fire Management Officer when developing prescribed fire management prescriptions.
- in HSIMP, incorporate a deer monitoring strategy if warranted. Include monitoring for exotic and invasive vegetation on an annual basis. Determine survey protocol to locate additional rare plant communities.
- visit all known rare plant sites; locate with GPS; map abundance, density and distributions; identify threats, including non-native and invasive species; establish a GIS database for inventory information; and incorporate new information into the HMP.

Goal 4: Protect the High Quality Wetland Habitats on the Refuge's Coastal Islands to Benefit Nesting and Migrating Shorebirds and Waterfowl

Objective 4.1 (Coastal Saltmarsh - Cross Island)

Protect the 15 acres of coastal saltmarsh on Cross Island to sustain its high quality and natural function and to provide breeding habitat for species of conservation concern such as Nelson's sharp-tailed sparrow, American black duck (breeding and wintering), and northern harrier (wintering and foraging).

Background: See Objective 2.1

*Strategies:**Within 5 years of CCP implementation:*

- in HMP, include strategies to maintain high quality saltmarsh habitat over time. Identify and evaluate threats to the saltmarsh. Utilize vegetative treatments such as mechanical, biological, chemical and prescribed fire, where appropriate, to manage desirable vegetation and to control invasive and exotic plants. Refine objectives as needed with new information and the revised cover type mapping.
- conduct sharp-tailed sparrow surveys according to Regional protocol.
- utilize the Global Programme Action Coalition (USGS) protocol to monitor and evaluate saltmarsh quality and natural function; beginning in 2006, monitor the area every five years.
- participate on the PIF Working Group and other regional landscape-scale efforts to review and evaluate the Refuge's contribution to the habitat and population objectives identified in regional, state, PIF, and species-specific plans. Update HMP as needed.
- in HSIMP, include monitoring for exotic and invasive vegetation on an annual basis.

Objective 4.2 (Intertidal Harvesting)

Within 1 year of CCP approval, initiate efforts to determine the effects on Federal trust resources from intertidal resource harvesting (e.g. blue mussels, blood worms, and periwinkles) on or adjacent to Refuge islands. In particular, evaluate reductions in foraging habitat for common eider and migrating shorebirds such as black-bellied plover, red knot, sanderling and least sandpiper, and disturbance to island nesting species (i.e. terns, common eider, Atlantic puffin, bald eagles) during the nesting season.

Background: The intertidal areas surrounding Refuge islands are open to commercial harvesting of invertebrates under the Colonial Ordinance of 1641-1647. Similar harvesting activities also occur adjacent to Refuge mainland properties. At this point in time, we have no means or methods to document the level of harvest, or even document the number of harvester visits to an island. However, the significance of amphipods and periwinkles (*Littorina spp.*) to eider ducklings has been well-documented (Mawhinney 1999). In addition, many harvesters visit the seabird islands during critical nesting periods, frequently causing the nesting birds to flush from their nests. In some instances, harvesters have landed on nesting islands and allowed their dogs to roam the island while they harvest the intertidal area.

Intertidal habitat surrounding coastal islands are also important foraging areas for tens of thousands of migrating shorebirds each season. It is unknown whether present or future harvest levels of invertebrates may adversely affect the availability of these critical forage items to the shorebirds.



Common eider hen
USFWS photo

Any reduction in food base may reduce the birds' fitness as they migrate south for the winter. The United States Shorebird Conservation Plan (Brown, Hickey, and Harrington 2000) identifies the need to determine population-limiting factors as the most critical need in the conservation of shorebirds.

In the past, rockweed harvesting has been a resource concern for many of the same reasons identified above for invertebrate harvesting. However, in 2001 the Federal regulation prohibiting taking plants on Federal lands, including rockweed, was provided to all licensed rockweed harvesters. This activity is now a law enforcement issue and will be monitored closely by our staff.

Strategies:

Within 5 years of CCP implementation:

- coordinate with Maine Dept. of Marine Resources, Moosehorn and Rachel Carson refuges, U.S. Geological Services (USGS), and the University of Maine to establish and initiate monitoring protocols to measure impacts from human disturbance and loss of forage to nesting and migratory species of conservation concern.
- hire a Marine Ecologist (GS 11).
- coordinate with commercial harvesters to identify harvest areas and level of take.
- as cooperative research opportunities arise, conduct food habitat studies for trust species of concern affected by intertidal harvesting.

Objective 4.3 (Aquaculture Facilities)

Within 1 year of CCP approval, initiate efforts to determine the effects of present and proposed commercial aquaculture facilities in the waters adjacent to Refuge islands supporting nesting seabirds, wading birds, bald eagles, and waterfowl.

Background: Within Maine, several aquaculture facilities have been developed in the waters adjacent to islands supporting nesting bald eagles. Information gathered to date indicates that with sufficient screening and adequate distance between nest sites and fish pens, eagles and aquaculture can co-exist (USFWS 1997). On several occasions, however, regulators have permitted aquaculture development close to bald eagle nesting islands and some of these have since experienced reduced productivity rates or site abandonment (Todd, pers. com. 2004).

We are unsure if there is a direct cause and effect on species of concern since no wildlife studies have been conducted in Maine prior to site development to establish a baseline. A study by Norm Famous evaluated wildlife response to aquaculture facilities, but the study was initiated after the site was developed and there was no pre-development data collected (Famous 1991). Therefore, it is difficult to assess true impacts, if any, of the facilities' development and operation on nesting birds and other wildlife. The general concerns raised by the conservation agencies include: disturbance to birds nesting on adjacent islands, loss of foraging habitat for nesting and wintering birds, entanglement, and attraction of predators (e.g. gulls and herons).



Aquaculture pens near Cross Island
USFWS photo

Research on this issue in British Columbia concluded that increasing numbers of aquaculture facilities in an area important to breeding seabirds can have deleterious effects on these populations in the long term (Booth and Rueggeberg 1989). They found this to be particularly true if sites are developed in proximity to species that have a limited number of large colonies, make intensive use of the surrounding area for foraging, and for which there are few alternate breeding areas available (e.g. terns and alcids). More information is needed to determine if there is a direct impact on nesting seabirds near Refuge lands.

Strategies:

Within 5 years of CCP implementation:

- coordinate annually with conservation partners including: Maine Dept. of Marine Resources, Army Corps of Engineers, MDIFW, NPS, Gulf of Maine Council, Natural Resource Council of Maine, Conservation Law Foundation, and USFWS-Ecological Services Maine Field Office to share information and concerns.
- develop and implement monitoring program with MDIFW, USGS, Maine Dept of Marine Resources, Army Corps of Engineers, University of ME Cooperative Education Unit, USGS, and aquaculture industry to measure whether or not the facilities have a negative impact on nesting birds of conservation concern. For example, determine whether birds are flushed from nests more frequently, birds are entangled in nets, or predators are attracted to the area. Also, establish baseline data to collect prior to new aquaculture developments near Refuge islands so a pre- and post-evaluation can be done.
- hire a Marine Ecologist (GS 11; same position as Objective 4.2).

Within 5-10 years of CCP implementation:

- work with aquaculture industry to minimize potential adverse effects of future aquaculture projects, including site location, cage design, stocking levels and fish age, netting characteristics, and project initiation intervals.

Objective 4.4 (Fall Shorebird Migration)

Within 5 years of CCP approval, evaluate at least three Refuge islands per year during fall migration (July to October) to determine the value of these islands to migratory shorebirds of concern such as red knot, black-bellied plover, piping plover, and whimbrel.

Background: The 1995 International Shorebird Survey Report identified several shorebird species which occur during fall migration on the Refuge and are in decline in our Northeast Region. These species include: black-bellied plover, whimbrel, semipalmated plover, red knot, sanderling, least sandpiper, purple sandpiper, and short-billed dowitcher. In addition, we suspect the Federal-listed threatened piping plover utilizes refuge lands since it nests north of the Refuge. Initial efforts to monitor shorebird use of coastal islands has indicated that these habitats may provide significant feeding and roosting habitats for large numbers of birds passing through during fall migration.

Strategies:

Within 5 years of CCP implementation:

- in conjunction with efforts identified in Objective 3.4, use seasonal contractors to conduct migratory shorebird monitoring on at least 3 Refuge islands per year determine shorebird use of habitats; utilize seabird management crews to monitor between May and early August. Surveys will also be initiated on appropriate mainland habitat.
- coordinate selection of shorebird monitoring sites and protocols used with national and regional efforts, including PRISM.
- complete cover type mapping for Refuge island habitats; update HMP as needed.

Within 5 -10 years of CCP implementation:

- evaluate monitoring data to determine habitat characteristics and dietary items preferred by shorebirds and whether active management is warranted; revise or update objectives in HMP as needed.

Objective 4.5 (Winter Shorebird Surveys)

Within 1 year of CCP approval, initiate survey efforts on at least three Refuge islands per year to determine use by wintering purple sandpipers.

Background: The purple sandpiper breeds in high northern latitudes and winters further north than any other shorebird. During winter months, they



Purple sandpiper banding

typically occur along wave-exposed rocky shores where they feed on amphipods, mollusks, and other intertidal invertebrates. The offshore habitats along the northeast Atlantic have been identified as extremely important to the survival of wintering purple sandpipers in the Western Hemisphere (Brown et. al. 2000). In addition, the North Atlantic Regional Shorebird Plan has identified as a high priority the need to identify and protect purple sandpiper winter habitats along the east coast (Clark and Niles 2000). Maine may play a significant role in providing winter habitat, as recent surveys indicate that approximately 33% of the eastern North American population of purple sandpipers winters off the coast of Maine.

Strategies:

- continue to conduct annual winter shorebird surveys in conjunction with harlequin duck surveys.

Within 5 years of CCP implementation:

- in cooperation with MDIFW, Acadia National Park (ANP), and the University of Maine, initiate boat surveys of coastal islands between the months of November and May to determine distribution and abundance of purple sandpipers; coordinate selection of shorebird monitoring sites and protocols used with national and regional efforts, including PRISM.
- cooperate in MDIFW and ANP efforts to capture and band purple sandpipers to facilitate monitoring movement among the islands used throughout the winter, and breeding areas.
- hire a Marine Ecologist (GS 11; same position as Objective 4.2)

Within 5-10 years of CCP implementation:

- by 2012, evaluate monitoring data to determine habitat characteristics preferred by purple sandpipers and whether active management is warranted; revise or update objectives in HMP as needed.

Goal 5: Protect and Restore Nesting Seabird Populations on the Refuge's Coastal Islands to Contribute to Regional and International Seabird Conservation Goals

Seabird Nesting Islands with Active Restoration

Objective 5.1 (Common and Arctic Tern)

Within the context of regional population goals identified in the Gulf of Maine Regional Tern Plan (USFWS 2002), increase the number of nesting pairs of Arctic and common terns (using the 2000 nesting season population estimates as a baseline), and achieve and maintain a productivity level of 1.0 fledged chick/nesting pair, on the six Refuge islands with active

seabird restoration projects: Petit Manan, Ship, Metinic, Seal, Pond and Matinicus Rock islands.

Background: Arctic and common tern populations were decimated in the Gulf of Maine in the late 1800's due to a combination of shooting and eggging for food and bait, and feather collection for the millinery trade. Conservation legislation passed in the early 1900's provided protection from human persecution, but expanding gull populations soon caused tern numbers to again decrease significantly. By 1977, tern numbers in the Gulf of Maine had decreased to only 5,321 pairs from a previous high of just over 12,000 in 1940. Within the Gulf of Maine, the number of islands supporting nesting terns had decreased by half. Cooperative efforts by members of Gulf of Maine Seabird Working Group (GOMSWG) have reversed this decline, and both species are experiencing population growth.

Although recent efforts have tended to focus on population level goals, members of GOMSWG have begun to focus on reproductive parameters (fledgling and recruitment rates) that may indicate overall health of the populations. Researchers have set the productivity level of 1.0 fledged chick/nesting pair as an objective for both tern species. Population estimates for the 2000 nesting season will serve as a baseline for setting future population goals. The population and productivity objectives will be evaluated every five years in cooperation with the GOMSWG.

Predator management is an important part of the restoration effort. The presence of a single mammalian predator (e.g. mink) or avian predator (e.g., great-horned owl, black-crowned night heron, or gull species) on a seabird colony can have disastrous effects on nesting seabirds. Predation can limit the distribution and abundance of breeding seabirds and their reproductive success. The effects of predation will vary depending on the type of predator, seabird species, habitat on the island, and time of year the predator arrives on the island. However the significance of predators is even greater for species limited to a few nesting colonies. Similar efforts may be needed on Refuge islands not currently supporting an active restoration project.

Strategies:

- continue cooperation with NAS and Canadian Wildlife Service; annually census islands for nesting common and Arctic terns; conduct productivity studies to estimate reproductive success; identify factors responsible for reduced productivity levels below the target of 1.0 chick/pair; continue to identify and initiate steps to minimize factors reducing productivity levels.
- continue cooperation with the Mid-Atlantic/New England/Maritimes Waterbird Working Group (MANEM) in setting population objectives for the region.
- continue to actively manage predator populations on an annual basis, using lethal and non-lethal methods to control gulls, owls, and small

mammals. If trapping is necessary, utilize Refuge staff or a contracted local trapper to set and monitor traps throughout the season. Coordinate trapping efforts with MDIFW and utilize best management practices of the International Association of Fish and Wildlife Agencies Technical Committee.

- in cooperation with NAS and MDIFW, continue to annually monitor effectiveness of trapping program and evaluate new and different techniques.
- continue to annually document and evaluate how often and how close tour boats come to nesting islands and the response by seabirds.
- continue to annually meet with tour boat companies prior to the season to discuss best management practices while operating near seabird nesting islands.
- continue to participate in cooperative effort (University of New Brunswick, NAS, and USFWS) to study the Arctic tern metapopulation within the Gulf of Maine.
- continue to annually close alcid, tern, and storm-petrel nesting islands to public visitation between April 1 and August 31.
- continue working with FAA to have Refuge islands identified on Flight Charts so that pilots are alerted to the 2,000 ft.-minimum recommended altitude over a national wildlife refuge.

Within 5 years of CCP implementation:

- in HMP, include strategies to manage for and sustain nesting terns on Petit Manan, Ship, Metinic, Seal, Pond, and Matinicus Rock Islands in cooperation with National Audubon Society. Utilize the Regional Tern Plan (USFWS 2002) to identify characteristics of desirable tern nesting habitat. Consider habitat management tools such as prescribed burning, herbicides, fencing, mowing, and sheep grazing. Evaluate information on sheep grazing collected on Metinic Island. Consider applicability of sheep grazing to other seabird islands after evaluating factors related to grazing seasons, flock size, risk to soils and native vegetation composition. If utilized, sheep grazing will be implemented under a special use permit with controls on flock size, timing, and distribution.
- in HSIMP, evaluate current tern monitoring strategies, in cooperation with NAS.
- also in HSIMP, develop monitoring strategies for exotic and invasive vegetation on an annual basis.
- hire a Marine Ecologist (GS 11; same position as Objective 4.2)

Objective 5.2 (Roseate Tern)

Within the context of regional population goals identified in both the Gulf of Maine Regional Tern Management Plan (USFWS 2002) and the Roseate

Tern Recovery Plan (USFWS 1998), increase the number of roseate terns nesting on the refuge islands (using the 2000 nesting season population estimates as a baseline) and maintain a productivity level of 1.0 fledged chick/nesting pair.

Background: Roseate terns are listed as an endangered species by both the Federal government and the State of Maine. The history of population decimation and recent rebounding is similar to that mentioned above for common and Arctic terns. Currently, there are approximately 286 pairs of roseate terns nesting on five islands in Maine. However, over 95% of the roseate terns are nesting on two non-Service owned islands; Eastern Egg Rock and Stratton Island. Within the Refuge, roseate terns nest on Petit Manan and Seal islands; have historically nested on Metinic, Matinicus Rock, Thrumcap, and Egg Rock; and have attempted nesting on Pond Island. This limited nesting distribution significantly increases the potential for a single catastrophic event to affect a major percentage of the population. The Roseate Tern Recovery Plan (USFWS 1998) has targeted the expansion of the Northeastern U.S. population to over 30 colonies, with six sites supporting at least 200 nesting pairs with high productivity (1.0 fledged chick /pair).

While Arctic and common terns prefer more exposed habitat, roseate terns generally prefer dense vegetation or some form of overhead cover (~ 70% cover). Fortunately, management for roseate terns can usually be accommodated on the same islands managed for common and Arctic terns, despite the differences in nesting habitat. A significant component of a successful seabird program, regardless of species, is predator management.

As with common and Arctic terns, members of GOMSWG have begun to focus on roseate tern reproductive parameters (fledgling rate and recruitment rate) that may indicate overall health of the population. Researchers have set the productivity level of 1.0 fledged chick/nesting pair as an objective for roseate terns; the same objective as common and Arctic terns.

Population estimates for the 2000 nesting season will serve as a baseline for setting future population goals. The population and productivity objectives will be evaluated every five years in cooperation with the Gulf of Maine Seabird Working Group, National Audubon Society, and the Roseate Tern Recovery Team.

While this objective for roseate terns is similar to Objective 5.1 (Common and Arctic Tern), we chose not to combine them because of the roseate tern's endangered status and to maintain flexibility should future recovery plan efforts require new, specific actions for this species.



Roseate tern

Photo courtesy of Bill Silliker, Jr.

Strategies:

- in HSIMP, evaluate monitoring strategies for nesting roseate tern with NAS and recovery team.
- continue to place Federal bands and field readable bands on roseate tern chicks, and read bands on adult terns in cooperation with the USGS roseate tern metapopulation study.
- continue to evaluate roseate tern use of artificial nest boxes on Petit Manan Island.
- continue to map all roseate tern nests using a GPS and incorporate into a GIS database.
- continue to actively manage predators on an annual basis, including lethal and non-lethal methods to control gulls, owls and small mammals. If trapping is necessary, utilize Refuge staff or a contracted local trapper to set and monitor traps throughout the season.
- in cooperation with National Audubon Society, continue to annually monitor effectiveness of trapping program and evaluate new and different techniques.
- continue to annually close alcid, tern, and storm-petrel nesting islands to public visitation between April 1 and August 31.
- continue to annually document and evaluate how often and how close tour boats come to nesting islands and the response by seabirds.
- continue to annually meet with tour boat companies prior to the season to discuss Best Management Practices.

Within 5 years of CCP implementation:

- begin to evaluate the effects of experimental habitat alteration designed to attract nesting terns and monitor microhabitats of nesting locations.
- in HMP, include strategies to manage for and sustain nesting by roseate terns on Petit Manan and Seal Islands, and establish nesting on Pond Island. Utilize the Regional Tern Plan (USFWS 2002) to identify characteristics of desirable tern nesting habitat. Develop management strategies in cooperation with National Audubon Society. Consider habitat management tools such as prescribed burning, herbicides, fencing, mowing, and sheep grazing. Evaluate information on sheep grazing collected on Metinic Island. Consider applicability of sheep grazing to other seabird islands after considering factors related to grazing seasons, flock size, risk to soils and native vegetation composition. If utilized, sheep grazing will be implemented under a special use permit with controls on flock size, timing, and distribution.
- in HSIMP, evaluate implementation, with NAS and the Roseate Tern Recovery Team, the monitoring strategies cooperatively developed for nesting roseate terns on the Refuge.

- also in HSIMP, develop monitoring strategies for exotic and invasive vegetation on an annual basis.
- annually coordinate efforts with Roseate Tern Recovery Team.

Objective 5.3 (Alcids)

Within the context of MDIFW Species Assessment (MDIFW 2000) population goals, increase the number of active alcid colonies on Refuge islands; increase the number of breeding pairs of Atlantic puffins and razorbills by 50% (using the 2000 nesting season population estimates as a baseline); and maintain a minimum productivity level of 0.5 fledged chicks/nesting pair.

Background: Maine represents the southern extent of the breeding range for alcids, including Atlantic puffins, razorbills, and black guillemots, in the North Atlantic. Atlantic puffins and razorbills are listed as threatened species by the State of Maine, due to small population size and because their breeding distribution is limited to four or five islands (85% of the birds nest on two Refuge islands). During the 2002 breeding season, Maine supported 450 pairs of puffins, 310 pairs of razorbills, and 12,273 pairs of black guillemots (MDIFW 2002).

In 1901, after decades of hunting, only one pair of puffins nested south of the Canadian border. This pair was located on the Refuge island known as Matinicus Rock. In the presence of gull control, Matinicus Rock continued to support a small population of breeding puffins. Survey results indicate that the 75 pairs of puffins on Matinicus Rock in early 1980’s were the only puffins breeding in Maine (S. Hall NAS pers. com.).

In an effort to enhance the recovery of this population, NAS and the Service initiated a puffin chick relocation project where young birds were brought from Newfoundland to Maine. This translocation effort is thought to have significantly enhanced the population growth rate and colony establishment for puffins in Maine. Puffins currently nest on three islands within the Refuge: Petit Manan, Seal, and Matinicus Rock

Records from the early 1900’s indicate that razorbills no longer bred in the Gulf of Maine. Razorbills currently nest on three islands within the Refuge: Old Man and Seal islands, and Matinicus Rock.

MDIFW completed a Species Assessment for puffins and razorbills (MDIFW 1999) in which they identified the need to increase both the size of the breeding populations and increase the geographic distribution and number of colonies.

Strategies:

- continue to conduct daily censuses of black guillemots, Atlantic puffins and razorbills on or



Razorbills
USFWS photo

adjacent to Petit Manan, Seal, and Matinicus Rock islands each year during the nesting season.

- continue to monitor productivity at 25 active puffin burrows on Seal and Matinicus Rock islands each year during the nesting season.
- continue to observe and record food deliveries to individual burrows to help determine reproductive success each year during the nesting season.
- continue to band adults and chicks where possible each year during the nesting season.



Black guillemot
USFWS photo

- continue to cooperate in the graduate study of Atlantic puffin survival and recruitment (Breton et al.) with NAS and University of New Brunswick by banding as many adult and juvenile puffins and reading as many bands as possible on birds returning to the islands.

- continue to annually close alcid, tern, and storm-petrel nesting islands to public visitation between April 1 and August 31.

- on Petit Manan Island, continue to map all active puffin and, if appropriate, razorbill burrows using GPS and incorporate into a GIS database.

- on Petit Manan Island, evaluate puffin and razorbill use of artificial burrows. On an annual basis, evaluate need to continue providing burrows and whether to expand efforts to new locations on island.

- continue to annually document and evaluate how often and how close tour boats come to nesting islands and the response by seabirds.
- continue to annually meet with tour boat companies prior to the season to discuss Best Management Practices when operating adjacent to seabird nesting islands.
- evaluate current and future Refuge islands for suitability as restoration sites. Develop management plans for selected islands including: predator control needs, staffing and equipment needs, logistical concerns, use of social attraction equipment, and habitat alteration considerations.

Within 5 years of CCP implementation:

- purchase at least one burrow scope to assist in determining productivity in individual burrows. Additional scopes will be purchased as funds become available.

- in HMP, include strategies to manage for and sustain nesting by alcids. Utilize MDIFW Species Assessment Plans to identify characteristics of desirable alcid nesting habitat. Develop management strategies in cooperation with NAS.
- in HSIMP, evaluate monitoring protocol for alcids nesting within the Refuge in cooperation with NAS.
- initiate alcid management effort on at least one Refuge island. Make effort to select an island that will provide nesting habitat for both puffins and razorbills. Coordinate with MDIFW and NAS. Purchase social attraction equipment (e.g., sound system and decoys) as needed.
- hire a Marine Ecologist (GS 11, same position as Objective 4.2).
- hire a Wildlife Biologist (GS 11).

Within 5-10 years of CCP implementation:

- initiate other alcid management projects (up to five) on Refuge islands.

Objective 5.4 (Laughing Gulls)

Reduce, or redistribute where possible, the number of laughing gull pairs nesting on Refuge islands (based on 2000 inventories) in an effort to minimize competition with, and predation on, common, Arctic, and roseate terns.

Background: Currently, laughing gulls nest on three islands within Maine, two of which are Refuge islands: Petit Manan Island and Matinicus Rock. The third island currently supporting nesting laughing gulls is MDIFW owned Eastern Egg Rock. These colonies represent the northern extreme of laughing gull breeding range in the United States, and they are listed as a species of special concern in Maine.

In recent years on Petit Manan Island, laughing gulls have experienced considerable population growth (175% in 10 years) and colony expansion. We documented 794 laughing gull nests on Petit Manan Island during the 2000 nesting season, and 961 nests during the 2001 season. Our staff and GOMSWG members are concerned that the gulls act as competitors with the terns for limited nesting space, directly prey on the terns and their eggs, and steal food from the terns.

In an effort to limit the number of laughing gulls nesting on Petit Manan Island in 2002, we created a “gull free” area on the island. This was accomplished by removing all laughing gull nests on the northern and eastern sides of the island. Our effort was not directed at eliminating laughing gulls as a breeding component of Petit Manan Island, but simply to manage the population growth and productivity of the gull colony. Productivity studies conducted on the tern colony in 2002 indicated that Arctic terns experienced significantly higher levels of productivity, as compared to recent years. NAS also carried out a similar control effort on Eastern Egg Rock.

Strategies:

- continue to cooperate with NAS and annually monitor Matinicus Rock and Petit Manan for nesting laughing gulls; map their distribution using GPS; determine their numbers and density; and document laughing gull kleptoparasitism and predation rates on terns. Incorporate all data into a GIS database.
- on Petit Manan Island, continue to confine the laughing gull nesting area to approximately five acres of the island (west of the boardwalk); utilize results of earlier experiments and consider other habitat manipulations or lethal removal of birds or eggs. Results of gull control efforts and corresponding tern productivity levels will be reviewed annually by Refuge staff and members of GOMSWG.



Laughing gulls
Photo by Craig Snapp

- continue to determine the effectiveness of experimental habitat alteration on laughing gull nesting distribution and density on Petit Manan Island.
- continue to annually evaluate other techniques to manage distribution and reduce laughing gull populations on Refuge islands when they are determined to be harming the productivity objectives for other seabirds of concern. Lethal controls would be considered if non-lethal techniques are ineffective.
- continue to annually close alcid, tern, and storm-petrel nesting islands to public visitation between April 1 and August 31.

Within 5 years of CCP implementation:

- in HMP, include strategies to manage laughing gull populations consistent with other seabird objectives. Develop strategies in cooperation with NAS and MDIFW. Consider habitat management tools such as prescribed burning, herbicides, fencing, mowing, and sheep grazing. Lethal controls, such as shooting and avicides would be used if non-lethal methods are ineffective.
- in HSIMP, in cooperation with NAS, evaluate protocol and continue monitoring laughing gulls nesting within the Refuge; include monitoring for exotic and invasive vegetation on an annual basis.

Objective 5.5 (Herring and Black-backed Gulls)

Control herring and great black-backed gulls nesting on Petit Manan, Ship, Pond, and Matinicus Rock islands and maintain selected areas of Seal (25 acres) and Metinic (15 acres) islands as “gull-free” areas, to minimize inter-specific competition and predation on common, Arctic, and roseate terns; puffins; razorbills, and common eiders.

Background: Expanding gull populations and habitat loss along the coast of Maine were responsible for wide-scale population declines in many seabird populations during the first half of the century. The prevalence of open landfills along the coast allowed herring and great black-backed gulls to produce a greater number of chicks. These gull chicks also experienced a greater survival rate due to the abundance of food during the winter months. Both species are effective predators of tern eggs and young, and their presence can lead to complete nesting failure or island abandonment by many species of seabirds. Gulls also initiate nesting earlier in the season than terns, forcing the terns to nest in marginal habitat. As a result, terns may be more vulnerable to increased predation, inclement weather, and tides. Gull control efforts on our managed islands have proven to be very successful. As a result, over 90% of the common, Arctic, and roseate terns, and all puffins and laughing gulls nesting within Maine nest on islands where gull populations are actively managed.

Strategies:

- continue to conduct daily censuses of nesting and loafing gulls on all six managed islands.
- continue to dissuade nesting and loafing gulls by maintaining a human presence throughout the nesting season on all six managed islands; remove all gulls determined to be preying on the terns or alcids using lethal and non-lethal techniques as warranted. Techniques include harrassment, destruction of nests and eggs, shooting and limited use of avicides. Continue to monitor gull colony at Green Island to determine whether these birds are contributing to predation on Petit Manan Island.
- continue to cooperate with MDIFW and USGS in documenting presence and activities of color banded gulls on Petit Manan Island.

Within 5 years of CCP implementation:

- in HMP, include strategies to manage herring and black-backed gull populations consistent with objectives for other seabirds of concern.
- in HSIMP, include method of monitoring herring and black-backed gull populations to insure other objectives for seabirds of concern can be met.
- initiate gull control efforts on future restoration sites, on an as-needed basis.

Objective 5.6 (Common Murre)

Establish and sustain a nesting colony of common murre on Matinicus Rock to contribute to the conservation of natural seabird diversity in the Gulf of Maine.

Background: Although common murres are known to breed throughout eastern Canada, no nesting attempts have been documented within Maine during the past century. However, records from the mid- 1800's indicate that murres did breed on at least one island in outer Penobscot Bay (Scott Hall NAS pers. com.). Like many other seabird species, the murre was nearly decimated by over-harvesting throughout much of the 20th century (Gaston and Jones 1998). We will continue working with NAS to utilize social attraction equipment (sound system and decoys) to re-establish a murre nesting colony in Maine. At present, our efforts are focused on Matinicus Rock, but murre routinely visit Seal and Petit Manan islands and we are monitoring this activity. Unfortunately, efforts to encourage birds to establish nesting colonies outside their current breeding areas has proven to be more difficult than establishing a new colony within an already occupied region.



Murre decoys
USFWS photo

Strategies:

- continue to utilize “social attraction” methods in cooperation with National Audubon Society to attract common murres to Matinicus Rock; sound system broadcasting murre calls and murre decoys are set up each nesting season in early May.
- continue to annually close alcid, tern, and storm-petrel nesting islands to public visitation between April 1 and August 31.
- continue to utilize seasonal staff to monitor common murre use of Refuge islands throughout the nesting season.

Within 5 years of CCP implementation:

- in HMP, incorporate strategies to manage common murres and minimize threats to nesting habitat.
- in HSIMP, work with NAS to develop monitoring strategy for common murres.
- evaluate potential to set up social attraction equipment to encourage murres to nest on additional Refuge islands.

Objective 5.7 (Leach's Storm-Petrel)

Within the context of MDIFW Species Assessment population goals (MDIFW 2000) maintain or increase the nesting populations of Leach's storm-petrels nesting on Refuge islands (using 2000 data as a baseline) and maintain a productivity level of 0.5 fledged chick/nesting pair.

Background: GOMSWG data indicates that Leach's storm-petrels are currently nesting on approximately 35 islands in Maine, with 17 of those islands being part of the Refuge. Within the United States, only two other breeding colonies are known to exist outside of the State of Maine (Penikese Island and Nomans Land Island NWR, Massachusetts) (MDIFW 1999).

Leach's storm-petrels are burrow-nesters and are active at the breeding colonies only during the evening hours, making surveys difficult. MDIFW Species Assessment for Leach's storm-petrel (1999) has identified the lack of offshore islands with suitable soil conditions for burrowing, predation, disturbance from human activities, and habitat degradation as the most important factors limiting distribution, abundance, and productivity of these seabirds.

Strategies:

- continue to cooperate with National Audubon Society to monitor burrow occupancy of Leach's storm-petrels on Matinicus Rock Island. Each spring during the nesting season, monitor all burrows within the established plots, including documentation of hatching success.
- continue to annually close alcid, tern, and storm-petrel nesting islands to public visitation between April 1 and August 31.

Within 5 years of CCP implementation:

- in HMP, incorporate strategies to manage for Leach's storm-petrel and minimize threats to nesting sites.
- initiate storm-petrel surveys on Refuge islands in conjunction with ongoing baseline biological inventories (Objective 3.6) and seabird surveys (Objective 5.9).
- in HSIMP, develop a standardized census methodology with GOMSWG members; specifically work with MDIFW to develop censusing protocol for Leach's storm-petrel; also establish a program to monitor productivity for Leach's storm-petrel on Petit Manan and Seal islands.
- hire a Wildlife Biologist (GS 11; same position as Objective 5.3).

Objective 5.8 (Common Eider)

Maintain or increase populations of nesting common eiders (using 2000 as the base year) on all Refuge islands, and continue participation in State and regional research and banding efforts

Background: In recent years, concern over the status of sea ducks has risen worldwide, and the Atlantic Northern Forest Bird Conservation Region (BCR) 14 has identified common eider as one of the highest priority waterbirds in the region. Compared to many other species of waterfowl, common eiders are characterized by delayed sexual maturity, small clutch size, low rates of annual recruitment, and high adult survival rates under normal conditions (MDIFW 1999). These characteristics make eiders particularly sensitive to environmental change or to factors influencing adult survival rates. Although many of the variables controlling eider survival and recruitment are not clearly understood, we do know that gull predation particularly that by great black-backed gulls, remains the major cause of mortality among eider ducklings. Research has shown that duckling survival rates are significantly higher in areas where gull numbers are controlled as part of our tern management program. Efforts by Maine Department of Inland Fisheries and Wildlife, U.S. Geological Survey, and the Refuge to investigate common eider survival and recruitment rates in the Gulf of Maine have begun to address these management concerns and research needs.

In recent years, the level of interest in commercial aquaculture development has increased significantly in Maine. In addition, the interest in commercial harvesting of the eiders major prey items: blue mussels, periwinkles, and green sea urchins has also increased in recent years. We do not have sufficient information to effectively evaluate the effects of these commercial activities on breeding, migratory, and wintering seabirds and waterfowl, including eiders.

Strategies:

- continue to annually close to public access the Refuge islands where only common eider and/or gulls are nesting during the period April 1 to July 31
- in cooperation with MDIFW and USGS, continue banding efforts to evaluate survival and recruitment rates, movement rates, and hunting mortality
- initiate standardized surveys of the breeding population that allows population trends to be monitored, but minimizes disturbance to the nesting females
- document significant seasonal distribution of eiders, particularly brood rearing and molting areas
- coordinate with partners in efforts to evaluate significance of commercial harvesting of resources from eider molting and wintering habitats
- coordinate with partners to determine effects of commercial aquaculture development on distribution and feeding rates of eiders.

Objective 5.9 (New Seabird Restoration Projects)

Consistent with Regional seabird population and distribution goals, and Refuge expansion opportunities, increase nesting tern and alcid populations and improve their distribution in the Gulf of Maine by establishing six new seabird restoration projects on Refuge islands.

Background: Expanding gull populations and recent increases in both recreational and developmental pressures along the coast of Maine continue to limit the availability of suitable nesting seabird sites. Over 90% of common, Arctic, and roseate terns, and all laughing gulls and Atlantic puffins in Maine currently nest on nine managed (i.e., seasonally staffed) seabird managed islands. In addition, over 90% of Arctic terns in Maine nest on three Refuge islands (Petit Manan, Matinicus Rock, and Seal), 85% of all puffins in Maine nest on two Refuge islands (Seal and Matinicus Rock), and 95% of the endangered roseate terns in Maine nest on two non-Refuge islands (Eastern Egg Rock and Stratton).

The number and geographic distribution of occupied seabird nesting islands has decreased significantly from historic levels (USFWS 2000). The potential for a single catastrophic event to significantly affect Gulf of Maine seabird populations is enhanced by the formation of large concentrations of seabirds nesting on a limited number of islands.

Unfortunately, we have limited opportunities to expand our restoration program to other Refuge islands currently in Service ownership. Instead, we are looking to expand our intensive management and restoration program with future acquisitions. New management sites are selected utilizing criteria established in the Roseate Tern Recovery Plan (USFWS 1998) and the Regional Tern Management Plan (USFWS 2000). Management activities will also be consistent with MDIFW species assessments for common eiders (MDIFW 2000), Atlantic puffins and razorbills (MDIFW 1999), and Leach's storm-petrel (MDIFW 1999). Depending on the suitability of an island for supporting nesting alcids and terns, management efforts may be coordinated with those outlined in Objectives 5.1, 5.2, and 5.3.

Strategies:

Within 5 years of CCP implementation:

- evaluate current and future Refuge islands for suitability as restoration sites.
- develop at least one restoration plan per year for those islands with potential. Plans will include: predator control needs, staffing and equipment needs, logistical concerns, use of social attraction equipment, ability to increase geographic distribution of colonies, habitat alteration needs, and public use and access restrictions.
- initiate one seabird restoration project on a Refuge island, with subsequent projects initiated every two to three years thereafter.

Increase the number of seasonal crews staffing the islands commensurate with the number of projects.

- establish the public access seasonal closures, similar to existing Refuge islands, from April 1 to August 31.
- update HMP and HSIMP as needed.
- coordinate all efforts on an annual basis with GOMSWG members.
- hire a Wildlife Biologist (GS 11; same position as Objective 5.3).
- hire a Marine Ecologist (GS 11; same position as Objective 4.2).
- purchase new boat (>20') to support management activities on coastal islands.

Seabird Nesting Islands with No Active Restoration

Objective 5.10 (Seabirds)

On the 25 Refuge seabird nesting islands without active seabird restoration projects, maintain nesting populations of common terns, razorbills, black guillemots, common eiders, great cormorants, double-crested cormorants, Leach's storm-petrels, and herring and black-backed gulls (using the 2000 survey season as a baseline) to contribute to state and regional population and distribution goals.

Background: Recent increases in both recreational and developmental use patterns of coastal islands have limited the number of islands that are suitable for nesting seabirds. Increasingly fewer opportunities exist for expanding seabird populations in the Gulf of Maine. Of the 3,500 islands along Maine's coast, seabirds currently utilize approximately 18% of these islands. Gull control efforts utilized by our staff and National Audubon Society are specifically focused on managed seabird islands. No efforts are made to control overall population levels of gulls on any other Refuge islands. Herring and great black-backed gulls contribute to the seabird diversity of the Gulf of Maine, and in fact, the presence of nesting gulls may be a significant reason for island acquisition.

In addition to the six seabird restoration islands currently within the Refuge, 25 additional Refuge islands provide nesting habitat for one or more species of seabird. These islands are infrequently visited by our staff, and statewide surveys have routinely been done by boat and aerial observation. A new survey protocol, initiated in 2001, will require that each seabird nesting island be visited, at a minimum, once every five years during the nesting season.

As previously noted, population and distribution goals for many of these species have been established by the Regional Tern Management Plan (USFWS 2000), the Roseate Tern Recovery Plan (USFWS 1998), and MDIFW Species Assessments for common eiders (MDIFW 2000), Atlantic

puffins and razorbills (MDIFW 1999), and Leach's storm-petrels (MDIFW 1999).

Strategies:

- continue to annually close to public access the Refuge seabird nesting islands from April 1 and August 31. The only exception is those islands with only gull or eider nesting. These will be closed to public access from April 1 to July 31 to conform more closely to State island closures.
- continue to survey five Refuge islands each year using Refuge staff, contractors, or partners to determine whether active management is warranted to maintain suitable nesting habitat; work in cooperation with the National Audubon Society and other partners to develop plans; utilize proven habitat management techniques consistent with other Refuge management projects. Update HMP for the Refuge as needed.
- continue to coordinate all efforts with GOMSWG members on an annual basis.
- continue cooperation with the Mid-Atlantic/New England/Maritimes Waterbird Working Group (MANEM) in setting population objectives for the region.
- continue to coordinate with MDIFW and USGS in the common eider survival study.

Within 5 years of CCP implementation:

- develop a standardized census methodology with GOMSWG members; specifically, work with MDIFW to develop census protocol for Leach's storm-petrel.

Objective 5.11 (Great Cormorant)

Increase the number of great cormorants nesting within the Refuge (based on 2000 inventories) and maintain a productivity level of 1.0 chicks/pair in an effort to maintain seabird diversity within the Gulf of Maine.

Background: The Atlantic Northern Forest Bird Conservation Region (BCR) 14 identified the great cormorant as one of the highest priority waterbird species for this region. Current information indicates that 80% of the North American population of great cormorants nests within this BCR. The total North American population of great cormorants is estimated at 11,600 pairs (Kushlan et.al. 2002). Although only 192 pairs of great cormorants nested in Maine in 2002, they represent the southern extreme of their breeding range. Within Maine, the birds nest on six islands, two are within the refuge; Little Roberts and Seal islands. To date, little information regarding factors that may be limiting population growth are available for Maine.

Strategies:

- continue to annually close seabird nesting islands to public visitation between April 1 and August 31.

Within 5 years of CCP implementation:

- in cooperation with NAS, MDIFW, and contractors initiate annual surveys of breeding colonies to determine population status and productivity rates for each colony.
- in conjunction with winter waterfowl and purple sandpiper surveys, monitor Refuge islands and adjacent waters for wintering great cormorants.
- in HSIMP, include strategies for monitoring great cormorants.

Goal 6: Provide Enjoyment and Promote Stewardship of Coastal Maine Wildlife and their Habitats by Providing Priority, Wildlife-Dependent Recreational and Educational Opportunities

Objective 6.1 (Environmental Education)

Within 5 years of CCP approval, 25% of school children within 15 miles of each Refuge office will participate in a Refuge environmental education program each year and will identify an action to undertake in their own community to support wildlife conservation.

Background: Environmental education is one of the six priority public uses designated by the Refuge System Improvement Act of 1997. The other five priority uses are hunting, fishing, wildlife observation and photography, and environmental interpretation. These six uses are to receive enhanced consideration in refuge planning and opportunities to engage in these activities should be provided to the extent compatible with Refuge goals and objectives. Educating young people about the significance of Maine’s coastal nesting islands and the Service’s management efforts will foster an appreciation of wildlife conservation and encourage them to make responsible environmental decisions in the future.

We currently have no curriculum-based environmental education program to offer local schools, but would accomplish this in the future through programs offered at the education facility described below. In addition, we would continue to support teachers who wish to lead on-site programs. We would also continue to support the National Audubon Society and Damariscotta River Association’s classroom environmental education programs, while ensuring the Service’s messages on conservation are shared. In addition, we would continue our partnership with the Chewonki Foundation and Hurricane Island Outward Bound School, who have established environmental education programs. We continue to issue a Special Use Permit to the Humboldt Research Station (formerly Eagle Hill Institute) for an “outdoor laboratory” on Refuge lands.

We describe in detail the need to work with partners for a mid-coast education center on the mainland in Chapter 3. In summary, this need is based on the fact that half of the Refuge’s acreage is on offshore islands,

inaccessible to most visitors, except a few islands which are seasonally accessed by tour boats or kayak. These offshore islands are fragile and vulnerable to human use, yet they are globally significant habitats. A mid-coast education center could reach many of the 5.4 million travelers passing through Rockland on U.S. Route 1 each year (MDOT, 2000). It will offer an opportunity for people to learn about these significant habitats, the unique species they support, and our seabird research, management, and restoration goals. The development of this center will dramatically increase our ability to conduct environmental education programs to larger and

more diverse audiences. In addition, it could also serve as a focal point for our outreach and interpretive programs. We have developed a Project Identification Document (June 2002) which describes our concept of this center. We are working with National and Maine Audubon to refine this concept and will further explore partnerships as new ideas and opportunities develop.

A goal of our proposed environmental education program is to get young people to take action in their own communities and to provide them with a foundation for making informed decisions affecting natural resources. With approximately 9,000 students within 15 miles of both Refuge offices, our environmental education programs could reach at least 2,250 students each year.



Environmental education
USFWS photo

Strategies:

Within 5 years of CCP implementation:

- hire one additional Outdoor Recreation Planner (GS-11) to plan, implement, monitor, and evaluate environmental education programs, and other Refuge public use programs. Within one year of hire, develop a monitoring and evaluation protocol to insure Refuge environmental education program is meeting objectives.
- complete a Visitor Service's Plan for the Refuge incorporating strategies identified herein; establish thresholds of acceptable change to resources resulting from public use; develop monitoring strategies to measure changes and to measure achievement of objective, and to evaluate visitor experiences. Modify or restrict access, or adapt management strategies as warranted.
- Evaluate opportunities to provide access on select islands during the nesting season for educational purposes

- establish partnerships with other conservation organizations and schools to conduct field-based environmental education in the Rockland area.
- develop hands-on environmental education activities for teachers to use in classrooms; consider an interactive, computer-based environmental education program about the Refuge and seabird management.
- conduct special environmental education events involving schools to celebrate International Migratory Bird Day and National Wildlife Refuge Week.
- implement annual monitoring protocol to evaluate the quality of the environmental education program.
- hold at least one “Teach the Teacher” workshop annually in the Milbridge area.
- utilize Partners In Flight plans for ideas to incorporate into environmental education programs related to migratory landbird conservation.
- develop an environmental education video about seabird restoration and management for use in the visitor center and schools.
- establish a partnership with NPS, Acadia National Park’s Schoodic facility, to participate in managing a Learning Center which will provide opportunities for Refuge staff to live and work on-site with NPS and other conservation groups.
- create an internship program in conjunction with Unity College or other institutions. Students in the program will work at the Coastal Education Center for a semester. Seek housing for interns and volunteers.
- develop at least one on-site, teacher-led environmental education program on a mainland division.
- in partnership with NAS and ME Audubon, finalize concept and design for a Refuge coastal education center in the mid-coast area along Route 1 that will provide interactive exhibits and staff- and volunteer-led environmental education programs.

Objective 6.2 (Environmental Interpretation)

Within 5 years of CCP approval, 90% of Refuge visitors will be able to name the Service as the agency managing the Refuge and will be able to identify at least one important Refuge habitat type and relate its significance to migratory birds and other native wildlife.

Background: Environmental interpretation is a priority public use identified in the 1997 Refuge Improvement Act and is one of the most important ways we can raise our visibility, convey our mission, and identify the significant contribution the Refuge makes to wildlife conservation. Public understanding of the Service and its activities in the state of Maine is

currently very low. Refuge visitors often confuse our agency with the MDIFW. Many are unaware of the Refuge System and its scope, and most do not understand the importance of the Refuge in the conservation of migratory birds.

Our proposed future programs will achieve our objectives through increased visitor contacts, on-site programs, and new and improved infrastructure. We want people to recognize that the Refuge has a priority to manage a variety of habitats to benefit migratory birds, with particular emphasis on restoring colonies of nesting seabirds. Through an expanded interpretive program, visitors will gain a better understanding of the unique and important contribution of this Refuge to migratory birds. Maps 4-1 to 4-4 depict new infrastructure to support this program.

Strategies:

- continue to allow all trails to remain open to foot traffic only, including snow shoes and cross country skis; however, no bicycles, horses, or ATVs would be allowed.

Within 5 years of CCP implementation:

- complete a Visitor Service's Plan for the Refuge incorporating strategies identified herein; establish thresholds of acceptable change to resources resulting from public use; develop monitoring strategies to measure change, measure achievement of objective, and to evaluate visitor experiences. Modify or restrict access, or adapt management strategies as warranted.
- develop interpretive signs for Halifax Island focusing on the rare plant community.
- install information kiosks outside of Refuge Headquarters and satellite offices
- hire one additional Outdoor Recreation Planner (GS-9) to plan, implement, monitor, and evaluate environmental interpretive programs, and other Refuge public use programs. This position will be used in other public use programs. Within one year of hire, develop a monitoring and evaluation protocol to insure Refuge interpretive program is meeting objectives to plan and implement programs.
- hire a summer intern to conduct interpretive programs for the mainland units; this position will also assist environmental education program. Seek housing for interns and volunteers.
- utilize Partners In Flight Plans for ideas to incorporate into interpretive programs related to migratory landbird conservation.
- enhance interpretation on Birch Point Trail on the Petit Manan Point Division, including interpretive overlook and interpretive panels at Carrying Place Cove; move the interpretive panels on the Hollingsworth Memorial Trail to a location less intrusive on the viewshed.

- construct low-impact interpretive trails and overlooks at the Gouldsboro Bay and Sawyers Marsh divisions, and at Corea Heath once acquired by the Service.
- develop a Refuge video, fact sheets, and brochures for use at on-refuge and off-refuge events.
- install Refuge interpretive panels at three coastal Maine roadside rest areas.
- in partnership with NAS and others, finalize concept and design for a Refuge coastal education center in the mid-coast area along Route 1 that will provide interactive exhibits and staff- and volunteer-led environmental education programs.
- hire two maintenance workers to help with public use facilities and other Refuge programs as needed.
- create an internship program in conjunction with Unity College or other institutions whereby students will work at the Coastal Education Center for a semester. Seek housing for interns and volunteers.

Objective 6.3 (Environmental Interpretation - Commercial Tours)

Within 3 years of CCP approval, 90% of the patrons who go on a commercial, Maine-based, seabird-tour boat excursion to a Refuge island will understand the value of Maine's coastal islands for nesting seabirds and be able to identify the Refuge's role in seabird conservation at the conclusion of their trip.

Background: Approximately 25,000 people annually take commercial seabird tour boat excursions from Bar Harbor, Maine past the Refuge's Petit Manan Island. The Bar Harbor-based companies typically hire on-

board naturalists to provide information about the natural history of seabirds and associated management and restoration projects. Since the boats do not land, they provide a unique opportunity for many people to observe and photograph seabirds without disturbing them. Our staff provides updated information weekly about the Petit Manan Island seabird colony to the tour companies. In the spring and summer, staff periodically go on tours to monitor the accuracy of presentations.

In addition to Bar Harbor, two other smaller operators are based in Jonesport and Cutler and take approximately 2,000 patrons annually to Machias Seal Island. These boats land on the island and patrons are allowed to view nesting seabirds through blinds.



Visitors touring Machias Seal Island
USFWS photo

In the future, we would like to increase the visibility of the Service and promote our conservation efforts through more direct involvement in these commercial operations. Below we propose to place interpreters on each tour boat viewing Refuge resources.

Strategies:

Within 5 years of CCP implementation:

- complete a Visitor Service's Plan for the Refuge incorporating strategies identified herein; develop monitoring strategies to evaluate visitor experiences, and to measure achievement of objective. Adapt management strategies as warranted.
- annually meet with tour boat operators with destinations to Refuge islands to provide information on the Service, the Refuge and its management purposes. Continue to provide the operators with updates on nesting status throughout the season.
- place interpretive panels about the Refuge and seabird conservation in tour boat operator's offices or launch sites and on the tour boats.
- hire enough summer interns or volunteers to regularly work as interpreters on tour boats viewing Refuge resources; seek challenge grants as possible funding source. Also, seek housing for interns and volunteers.
- develop method of surveying tour boat patrons at the end of their tour to determine if our objective is met; look for partners to help with surveys.

Objective 6.4 (Hunting)

Provide an expanded, high quality hunting program in which 80% of Refuge visitors, both hunters and non-hunters, will report having had a positive experience on the Refuge during any hunting season.

Background: In May 2001, we issued a final Refuge Hunt Plan and environmental assessment after a 30 day public review and comment period. These documents resulted in approval to open up portions of the Refuge to hunting for the first time since in Service ownership. With our hunt program, we intend to: 1) maintain a diversity of habitats within the Refuge that are capable of supporting a diversity and abundance of wildlife species, and 2) provide wildlife-dependent recreational opportunities. We recognize hunting as a healthy, traditional, outdoor pastime that is deeply rooted in American heritage and, when managed appropriately, can instill a unique understanding and appreciation of wildlife, their behavior, and their habitat needs. It is also a priority public use on national wildlife refuges, where compatible, as stipulated in law.

The Refuge Hunt program was first implemented during the 2001-2002 State seasons. The Gouldsboro Bay and Sawyer's Marsh divisions are open

to migratory game bird and waterfowl and small and big game hunting. Bois Bubert Island is open to white-tailed deer hunting only. Twenty-two additional Refuge islands are open to migratory waterfowl hunting.

The Petit Manan Point Division was not opened to any hunting under this 2001 hunt plan, but this CCP allows for a new hunting opportunity. A deer hunt area will be opened above the entrance road in the Birch Point trail area to: 1) hunters with disabilities during the regular rifle season, and 2) hunters of all abilities during the regular muzzle-loader season. This change is in response to MDIFW's request for the additional hunting opportunity and Service direction to accommodate high priority recreational opportunities on NWRs where compatible.

According to the draft policy on hunting on national wildlife refuges, issued in the January 16, 2001 Federal Register, a quality hunting experience is one that: 1) maximizes safety for hunters and other visitors; 2) encourages the highest standards of ethical behavior in taking or attempting to take wildlife; 3) is available to a broad spectrum of the hunting public; 4) contributes positively to or has no adverse effect on population management of



White-tailed deer on Petit Manan Point Division
Photo by Craig Snapp

resident or migratory species; 5) reflects positively on the individual refuge, the System, and the Service; 6) provides hunters uncrowded conditions by minimizing conflicts and competition among hunters; 7) provides reasonable challenges and opportunities for taking targeted species under the described harvest objective established by the hunting program; 8) minimizes the reliance on motorized vehicles and technology designed to increase the advantage of the hunter over wildlife; 9) minimizes habitat impacts; 10) creates minimal conflict with other priority wildlife-dependent recreational uses or Refuge operations; and 11) incorporates a message of stewardship and conservation in hunting opportunities. These are all criteria we will use to evaluate our hunt program.

Strategies:

- continue policy that all trails open to hunting will remain open to foot traffic only; no bicycles, horses, or ATVs will be allowed.
- continue to allow dogs off leash only to facilitate the hunt effort and only under control of the hunter at all times. This would include flushing, pointing, and retrieving dogs.
- continue to annually conduct patrols of Refuge lands, both open and closed to hunting.
- continue to annually review the Refuge Hunt Plan and institute changes as appropriate.

Within 5 years of CCP implementation:

- complete a Visitor Service's Plan for the Refuge incorporating strategies identified herein; establish thresholds of acceptable change to resources resulting from hunt program; develop monitoring strategies to measure resource change, measure achievement of objective, and evaluate visitor experiences. Modify or restrict access, or adapt management strategies as warranted.
- annually hold at least one hunter orientation program on the Refuge or in local communities.
- within 1 year of CCP approval, open Petit Manan Point to the following deer hunting opportunity: a) hunters with disabilities during the regular rifle season, and 2) hunters of all abilities during the regular muzzle-loader season. Modify the existing hunt plan to incorporate this change.
- produce a Refuge hunting brochure, including Refuge regulations and maps.
- establish a monitoring protocol for evaluating the quality of experience for hunters and non-hunters during various hunting seasons.
- hire GS-7 and GS-9 law enforcement officers to help administer the program and conduct visitor outreach.

Objective 6.5 (Wildlife Observation and Photography on Mainland Divisions)

Within 5 years of CCP approval, create and enhance opportunities for high quality wildlife observation and photography on the Refuge mainland divisions, while insuring that 80% of adult visitors report they will return to the Refuge because it represents to them an ideal natural environment within which to observe and photograph wildlife (Maps 4-1 to 4-4).

Background: Wildlife observation and photography are two of six priority public uses designated by the Refuge System Improvement Act of 1997. The other four priority uses are hunting, fishing, and environmental education and interpretation. These six uses are to receive enhanced consideration in refuge planning and opportunities to engage in these activities should be provided to the extent compatible with Refuge goals and objectives.

We believe we can improve our existing programs and create new, high-quality opportunities for wildlife observation and photography on our mainland divisions. We currently maintain two foot trails: the Hollingsworth Memorial Trail (1.5 miles roundtrip) and the Birch Point Trail (4.0 miles roundtrip). Both trails are on the Petit Manan Point Division and are open year round. The John Hollingsworth Memorial Trail has parking for approximately eight cars; the Birch Point Trail has parking for approximately 10 cars. There are many times during summer when the parking lots are full. We are currently monitoring trail and road usage on Petit Manan Point using volunteers, interns, and counting machines. During 2001,

approximately 19,000 people visited the area. Our current program also allows commercial photographers access to Refuge lands, which are otherwise closed to public access, under individual special use permits. The only fully accessible facility on the Refuge is an informational kiosk on the main access road to Petit Manan Point.

Under this alternative we are proposing to develop a wildlife observation, photography, and interpretative trail on each of the mainland divisions.

Strategies:

- continue policy that all trails will remain open from sunrise to sunset, to foot traffic only, including snowshoeing and cross country skiing; no bicycles, horses, or ATVs will be allowed. The only vehicle access is on Petit Manan Road, Petit Manan Point Division.
- continue to allow commercial filming and photography on the Refuge only when there is a direct benefit to the Refuge and/or the Service. All allowed commercial filming and photography will operate under a special use permit once determined compatible by the Refuge Manager.

Within 5 years of CCP implementation:

- complete a Visitor Service’s Plan for the Refuge incorporating strategies identified herein; establish thresholds of acceptable change to resources resulting from public use; develop monitoring strategies to measure change, measure achievement of objective, and evaluate visitor experiences. Modify or restrict access, or adapt management strategies as warranted.



A visitor on the Birch Point Trail, Petit Manan Point Division
USFWS photo

- Move the signs near Chair Pond on the Hollingsworth Memorial Trail to a location that is less imposing on the viewshed.
- construct a parking area and wildlife observation and photography trail on the Gouldsboro Bay Division.
- construct a parking area and accessible trail with overlook on the Sawyers Marsh Division.
- construct one barrier-free trail and observation platform at Corea Heath Division. Trail will occur on existing raised road foot print and be approximately 1,000 ft in length.
- hire GS-7 and GS-9 law enforcement officers to help administer the program and conduct visitor outreach (same positions as Objective 6.4).

Objective 6.6 (Public Access on Refuge Islands)

With primary consideration to wildlife protection and public safety, allow access to Refuge islands so visitors can observe and photograph these unique, natural landscapes. Within 3 years of CCP approval, at least 90% of island visitors contacted can explain, and fully support, the purpose of access restrictions, and further support island conservation by conducting themselves according to “Leave No Trace” principles.

Background: Our primary responsibility is to protect wildlife and promote wildlife conservation. To this end, some sensitive areas require us to restrict public access to minimize disturbance to wildlife, especially during the nesting season. The Refuge’s seabird nesting islands are closed to public use and access from April 1 to August 31 each year. The only exception to these dates is on islands where only gulls or eiders are nesting. The closure period on those islands is April 1 to July 31, which more closely conforms to State closure periods. On active bald eagle nesting islands, the closure period is February 15 to August 31 each year. Historic bald eagle nesting islands, which are not currently active, will have a closure period from February 15 to May 15 to encourage nesting. If no bald eagle activity is observed by May 15, the island will be opened to public use and access. If bald eagle activity is observed, the island will remain closed until August 31. As new islands are acquired by the Service, or new biological information is obtained on current Refuge islands, the closure periods will be modified to conform to the respective dates noted above.

Most of Halifax Island is closed to protect botanical resources. Seal Island is closed to all public use due to unexploded ordnance. Cross, Scotch, Bois Bubert, and the remainder of Halifax Island are open to public use year round. In addition, camping is allowed in designated areas on Bois Bubert and Halifax islands as part of the Maine Islands Trail Association (MITA) trail system. Unfortunately, we do not currently have a systematic and objective way to measure impacts to island resources. We would like to work with MITA and other partners to establish thresholds on what is acceptable change to resources and when should restrictions or mitigation measures be imposed to reverse unacceptable change before it's too late.

We utilize interns to help manage potential visitors trying to land on a seabird island during the nesting season. They alert visitors to the closure regulations and discourage them from disembarking.

Notwithstanding these restrictions, we encourage visitors to engage in compatible, priority public uses on Refuge islands to gain an appreciation of their beauty and significance to migratory birds. Although rugged in appearance, Maine’s offshore islands are delicate ecosystems. “Leave No Trace” is a nationally recognized curriculum of outdoor ethics that promotes mindful use of recreational lands. We will encourage visitors to use Leave No Trace principles by promoting them during visitor encounters and through Refuge literature and outreach information.

Strategies:

- continue to annually evaluate island access restrictions, and considering new information, modify as necessary to protect sensitive areas or species of management concern.
- continue to work with MITA, under a special use permit, to manage the camping on two islands; no expansion of camping opportunities would occur.

Within 5 years of CCP implementation:

- insure interpretive and regulatory signs are posted on all Refuge islands with restrictions.



Freshwater pond on Bois Bubert Island
USFWS photo

- develop Refuge criteria or guidance on appropriate protective measures required for visitation to the Refuge's nesting islands within 2 years of CCP approval, in conjunction with the Visitor Services plan. Also, evaluate whether opportunities exist for education programs on a limited number of nesting islands during the nesting season.
- meet with MITA two to three times per year to discuss the Island Stewardship Program on Refuge islands open to day use.
- train all Refuge staff members in "Leave No Trace" principles.
- hire GS-7 and GS-9 law enforcement officers to help administer the program and conduct visitor outreach (same positions as Objective 6.4).
- work with MITA, ME Bureau of Parks and Lands, and other partners to design and implement a monitoring protocol to establish thresholds of acceptable change on both day use and camping islands to prevent unacceptable, irretrievable damage from occurring to resources. Such things as vegetation and soil erosion both inside and outside of designated camping sites would be monitored on a regular basis. Also develop protocol to measure "Leave No Trace" compliance.
- establish an Island Stewardship Program on at least five Refuge islands to help monitor public use and associated effects on wildlife and habitats. Existing informal stewardship programs with local land trusts for Little Thrumcap, Outer White, and Roberts Islands should be formalized.
- develop a Refuge brochure about colonial nesting seabirds and the importance of the use of "Leave No Trace" principles when visiting the islands.
- as new islands are acquired by the Refuge (see Goal 7, Objective 7.1), priority compatible uses would generally be allowed consistent with seasonal restrictions during the nesting season, unless there are overriding resource concerns. Existing compatibility determinations will be amended accordingly.

Goal 7: Protect the Integrity of Coastal Maine Wildlife and Habitats through an Active Land Acquisition and Protection Program, and through Special Land Designations

Objective 7.1 (Service Island Acquisition)

To insure the permanent protection of important Maine coastal island habitats, during the 15-year life of this CCP, the Service will pursue acquisition, from willing sellers, of an additional 87 nationally significant coastal nesting islands, which currently lack permanent protection (see Land Protection Plan, Appendix A).

Background: We describe in Appendix A, how we have worked with the Service's GOMP, MDIFW, MCHT, and our other land conservation partners to develop a "nationally significant coastal nesting islands" list for coastal Maine. Three hundred and seventy-seven (377) islands are currently on the list; 226 of these are already protected long-term (GOMP, December 10, 2001). The remaining 151 islands are still in need of permanent protection. The ultimate goal among all partners is to achieve permanent protection for these 151 islands, and to manage them as needed to insure the long-term nesting success of species of management concern.

The Service can contribute to this goal best through acquisition, especially for those islands that need active management for Federal trust species. We have determined that, based on our rate of acquiring Maine coastal islands since 1993, 87 islands is a reasonable and practical 15-year objective for the Service. Eighty-seven is based on assuming an average acquisition rate of approximately six islands/year for the 15-year planning period. This seemed reasonable to us based on the fact the Service has acquired up to 12 islands/year (1995), and has twice acquired more than 6 islands/year. As such, 6 islands represents the mid-point in the range of the historic acquisition rate; from a maximum of 12 to a minimum of 0 in any given year. The Service would consider fee simple acquisition, purchase of conservation easements, acceptance of land donations, land transfers or exchanges, as methods of acquisition from willing sellers.

Since no single partner, including the Service, has the resources to achieve the 151 island protection goal single-handedly, this goal necessitates a strong land protection partnership. As an individual island becomes available for sale from a willing seller, the Service and its coalition of island protection partners determines which partner, through ownership, could best serve the long-term protection of the respective island. The island's specific resources of significance (e.g. seabirds, bald eagles, wading birds, or the endangered roseate tern), the level of management or restoration required, its proximity to other partner-owned islands, current owner preferences, timing, and availability of financial and administrative resources are all considered when determining the recommendation for ownership.

In developing this alternative, we have identified which 87 unprotected nationally significant coastal nesting islands we believe, given current resource information and consideration of the factors above, should be in Service ownership. It is important to recognize that there may be a need to reconsider individual islands as new information becomes available. In the

future, any island being considered for Service acquisition that is not on the Appendix A list may require additional NEPA compliance documentation.

While our principal mission in acquiring these islands is the protection of Federal trust wildlife resources, there are other important resources on the islands identified, such as cultural and historic resources. It is not the Service’s intent to acquire historic structures, such as lighthouses, which may occur on these islands unless it is essential to secure the protection and management of wildlife resources. If possible, the preference is to seek partners willing to undertake responsibility for the management and protection of these resources.

Table 4-1 summarizes our land acquisition plan.

Table 4.1 Land acquisition summary

Lands approved for acquisition prior to the 2005 LPP for Petit Manan Refuge*	
Mainland	120 acres
Islands (or parts of) 14 islands**	347 acres
Corea Heath	400 acres
Lands approved for acquisition in the 2005 LPP for Petit Manan Refuge	
Mainland	153 acres
Islands (or parts of) 87 islands	2,306 acres
Total Acres to be acquired:	3,326 acres

*Acquisition has been on-going during development of the CCP. Contact Refuge Headquarters for the latest information.

**Six of the islands are already part-owned by the Service; or in the process of Service acquisition.

Strategies:

- continue to acquire private lands on islands from willing sellers within currently approved acquisition boundary; 25 tracts on 14 islands (347.5 acres). All lands acquired would become part of Petit Manan Refuge.
- continue to participate in annual coordination with the Gulf of Maine island protection partners including: GOMP, MDIFW, TNC, MCHT, local land trusts, and private landowners.
- continue to work annually with GOMP to insure nationally significant island list is updated.
- once approved, begin to implement the Land Protection Plan (LPP) for the Refuge (Appendix A), authorizing acquisition of 87 islands (approximately 2,306.4 acres) from willing sellers.

Objective 7.2 (Cooperative Protection and Management of Islands)

Support the efforts of our land conservation partners in protecting and managing the other 64 nationally significant coastal nesting islands, as well

as all other islands supporting Federal trust species not permanently protected, and not proposed for Service acquisition in the Land Protection Plan.

Background: As noted above under the Background for Objective 7.1, all 151 islands are nationally significant and the goal is to seek permanent protection for each one. Protection of nationally significant Maine coastal islands has always been a partnership effort, and would continue to be so. We would continue to play a role in identifying the most important islands for Federal trust resources. Under this alternative, the Service would not be acquiring all the islands considered nationally significant. It would be our hope that our partners would take the lead in acquiring whatever rights are needed to permanently protect the 64 islands and all other islands important to Federal trust species. However, within the limits of our funding and staffing, we would also be willing to share in management of these islands. Cooperative management agreements with conservation landowners are one tool to achieve resource objectives on many islands where the owner “can’t do it all.” An agreement may involve the Service helping to manage public use, or providing signage, conducting banding for long term monitoring, or doing periodic habitat manipulations. Each agreement would need to be specific to the island.

Strategies:

- continue to participate in annual coordination with the Gulf of Maine island protection partners including: Service’s GOMP, MDIFW, TNC, MCHT, local land trusts, and private landowners.
- continue to work with Service’s GOMP to insure the nationally significant island list is updated.
- on a case-by-case basis, continue to consider cooperative management agreements with other ownerships where protection of Federal trust resources is a priority.

Objective 7.3 (Service Mainland Acquisition and Protection)

Within the established Maine Wetlands Protection Coalition Team framework, each year continue to identify and pursue long-term protection of Maine coastal properties important for Federal trust resources conservation.

Background: The Refuge has for many years worked in cooperation with conservation partners on mainland acquisition and protection of important habitats in coastal Maine. Partners such as MDIFW, Maine Coast Heritage Trust, and the Service’s Gulf of Maine Program meet periodically to discuss opportunities to protect important wildlife habitats on the mainland. Included in this partnership is the Maine Wetlands Protection Coalition Team effort, which was convened to implement the North American Waterfowl Management Plan. With MDIFW as the lead agency, this interagency team is developing regional protection plans which will identify and prioritize biologically significant wetlands within each region in need of long-

term protection. The team is currently evaluating the mainland coast nearest the Refuge's mainland divisions. Once a regional plan is developed, we will work with the team to determine which properties contain Federal trust resources and are best served under Service ownership.

Over the years, many landowners have expressed interest in selling their land to the Service. In fact, over the last 25 years, landowners have willingly sold several thousand acres, resulting in our three mainland divisions in the Towns of Milbridge, Steuben, and Gouldsboro. A fourth division, Corea Heath, comprised of 400 acres in the Town of Gouldsboro is in the process of being transferred to the Service from the Department of the Navy (U.S. Navy). Since 2000, we have been working with the U.S. Navy, the Town of Gouldsboro, and Congressional staffers to protect this undeveloped area of heathland, an ecologically significant bog community. An additional 57-acre developed area would be transferred to a state or municipal entity.

This alternative would include Service acquisition of 119.6 acres of private inholdings in 3 tracts already approved for acquisition, and an expansion of 153.3 mainland acres. The expansion acres include a 3.3 private tract in our Gouldsboro Bay Division and a 150 acre area known as "Sprague Neck" in the Town of Cutler on Machias Bay. Sprague Neck is a priority protection area under the Atlantic Coast Joint Venture Plan and has been identified by MDIFW and our GOMP as a significant habitat for migrating shorebirds. Sprague Neck is currently U.S. Navy property, and we would pursue acquisition via a no-cost transfer.

Strategies:

- continue to acquire 120 acres of private lands within the currently approved Refuge boundary on the mainland divisions; two tracts on Petit Manan Pt and one on Sawyers Marsh. All lands acquired would become part of Petit Manan Refuge.
- once approved, begin to implement the LPP for Petit Manan Refuge (Appendix A), authorizing an expansion of 153.3 acres of significant Federal trust resources habitat, when willing sellers become available.
- beginning in 2005, Refuge staff will participate on the interagency Maine Wetlands Protection Coalition Team. We expect this team may develop a plan within 3 years of CCP approval. Pursue contacts with landowners to establish willingness to sell. These lands are not covered by the LPP and approval would require additional environmental analysis and compliance documentation.
- Until the Wetlands Protection Coalition Team plan is completed, and/or considering significant habitats other than wetlands, continue to cooperate with the Service's GOMP, MDIFW, TNC, MCHT, local land trusts, and private landowners to seek a means of protection when parcels become available. Consider acquisition of these properties on a

case-by-case basis if the partnership determines that protection is best served by Service ownership. These lands are not covered by the LPP and approval would require additional environmental analysis and compliance documentation. Pursue Service fee acquisition or conservation easements of these lands as warranted by approvals.

Objective 7.4 (Local Support for Service Land Acquisition)

To develop local support for continued Refuge expansion, within 5 years of CCP approval, contact each affected town's elected officials to share information on the benefits of refuge lands to their community.

Background: Our desire is to be considered a welcomed and appreciated asset to the local communities within which refuge lands occur. We recognize that some residents and elected officials are concerned with the impact refuge lands has on the local tax base since the Service does not pay property taxes. On the other hand, since 1935, the Service has made annual refuge revenue sharing payments to affected towns based on an annual allocation formula determined by Congress. This amount can sometimes equal or exceed the amount of tax revenue that would have been collected if in private ownership.

We believe most residents view the presence of refuge lands in their community as positive. By maintaining natural landscapes, we are affording opportunities for residents to enjoy nature and observe wildlife. We also promote this enjoyment through outreach, environmental education and interpretive programs. Local communities can also benefit when a refuge draws visitors who spend money at local businesses. We would like to promote these benefits to enhance our support by local residents.

Strategies:

Within 5 years of CCP implementation:

- each year, with distribution of refuge revenue sharing payments, staff will make personal contacts with respective local elected town officials to discuss benefits of refuge lands and land acquisition opportunities.
- each year, contact community officials in towns where Service land acquisition is approved to provide information on the Refuge System, and the values of refuge lands in their community.
- each year, make periodic contacts with local community leaders, such as chambers of commerce, bed and breakfast associations, the Down East Corridor Association, service clubs and organizations to promote the benefits of refuge lands and our land acquisition program.
- each year, meet with the Star Island Corporation to update them on Refuge programs and management projects on Smuttynose Island.
- each year, meet with members of the Damariscotta River Association and Boothbay Region Land Trust to update them on Refuge programs in the mid-coast area.

Objective 7.5 (Wilderness Designation)

Recommend wilderness designation for 13 Refuge islands in 8 Wilderness Study Areas and manage these islands to retain their wilderness character and values consistent with refuge establishment purposes and the Refuge System mission.

Background: The Service's Refuge System Planning Policy requires that a wilderness review be conducted concurrent with the CCP process. During 2001, we initiated a wilderness review of existing Refuge lands. The review process consists of three phases: inventory, study, and recommendation. Our wilderness review process and maps of the Wilderness Study Areas (WSAs) are presented in detail in Appendix D.

To summarize, the inventory phase took a broad look at existing Refuge lands to identify lands and waters that meet the minimum criteria for wilderness, as defined in section 2(c) of the Wilderness Act (16 U.S.C. 1131-1136). The criteria used are size, naturalness, opportunities for solitude or primitive recreation, and supplemental values. Areas that meet these criteria are defined as WSAs. We determined 13 islands met the minimum criteria. We combined these 13 islands into 8 WSAs. The boundaries around these WSAs are defined by the high water mark, and exclude private inholdings and rights-of-way on Cross and Bois Bubert islands, and the common boat landing and Lily Pond on Bois Bubert Island (Appendix D).

In the study phase, we evaluated whether we could manage these 8 WSAs, individually and collectively, over the long-term to maintain the quality of their wilderness values and character without compromising our ability to meet refuge purposes and the Refuge System mission. We specifically evaluated the impacts wilderness designation would have on our current or planned refuge management activities and refuge uses, including allowed public use and access. No impacts were identified. We also considered the potential impacts to the wilderness resources from off-site activities such as tour boat operations, commercial and recreational fishing, aquaculture facilities, and intertidal harvesting activities, and do not believe the current levels of activity and facility developments diminish wilderness character in the 8 WSAs. We also do not anticipate that wilderness designation would cause any restrictions on current levels of these uses.

In this CCP, we are recommending all 8 WSAs for designation as wilderness. As part of this recommendation, if the exclusions noted above are acquired by the Service, we propose to incorporate them into the respective WSA or designated wilderness, through administrative action.

This wilderness recommendation is a preliminary administrative determination that will receive further review and possible modification by the Director. If approved, we will forward the final recommendations from the Director, through the Secretary of Interior and the President, to Congress in a wilderness study report. Congress has reserved the authority to make the final decisions on wilderness designation.

Insofar as it does not impact our ability to meet refuge purposes, and the Refuge System mission as outlined in the 1997 Refuge Improvement Act, we will manage the WSAs in accordance with management direction in this final CCP and maintain the islands' wilderness character, natural values, and outstanding opportunities for solitude and primitive recreation. This direction would remain in place until Congress makes a final determination on their addition into the National Wilderness Preservation System (NWPS), or unless we obtain information that warrants a modification to the recommendation. If a modification is necessary, we would amend this CCP to change or remove the wilderness recommendation.

Strategies:

Within 5 years of CCP implementation:

- evaluate all planned and future proposed Service activities, projects, or new uses in the WSAs for their potential to directly, indirectly, or cumulatively impact the wilderness values and character. We will conduct a "minimum requirement analysis" (MRA) for each activity to assess potential impacts and identify mitigating measures to protect wilderness character.
- allow, in general, activities that involve temporary uses that create no new surface disturbance and do not involve placement of permanent structures.
- once formal designation occurs, within two years, develop a wilderness stewardship plan (WSP) as a step-down plan. The WSP will identify goals, objectives, and stewardship strategies for wilderness areas based on refuge purposes, the Refuge System mission, and wilderness stewardship principles.
- evaluate all future Refuge acquisitions for their wilderness potential concurrent with the next required revision of the CCP.

Objective 7.6 (Special Designation for Corea Heath Division)

Within 5 years of CCP approval, evaluate the Corea Heath Division for its potential as a Research Natural Area or other special area designation.

Background: Numerous studies have identified Corea Heath as an exemplary coastal plateau bog ecosystem (e.g. Worley, 1980; Glanz and Connery, 1998). It is best described as a clearly raised, essentially treeless, coastal peatland with some rare and unique coastal vegetation. This peatland is designated as a Maine Critical Area because it is one of the largest and most southerly coastal raised peatlands in North America, and because its unique concentric arc pattern of vegetation is rare in the coastal region (Worley 1980). It was formerly a U.S. Navy electronics facility and public use was not allowed. The limited construction that occurred, and the restricted access, has resulted in very little disturbance to the peatland. Since drainage patterns appear unaltered, and since the peat deposit seems intact, the site offers a significant opportunity to study this unique ecosystem.

Strategies:

Within 5 years of CCP implementation:

- review special designations within Service's authority to determine if the Corea Heath Division qualifies; pursue designation according to Service policy as warranted.

Objective 7.7 (Archaeological Resources)

Preserve archaeological resources on the Refuge from destruction by coastal erosion or artifact looting.

Background: Service actions likely to affect archaeological and historic sites are routinely reviewed and assessed under the provisions of Sec. 106 of the National Historic Preservation Act. To date, projects requiring such review on the Refuge have been confined to architectural rehabilitation of lighthouse structures, so Refuge lands have never had a systematic archaeological survey.

Based on archaeological studies of similar environments in Maine (Kellogg, 1982; Yesner 1980), it is likely that many unrecorded coastal archaeological sites exist on the current Refuge and on islands proposed for acquisition. It is also very likely that all these sites are undergoing some erosion. All recorded prehistoric archaeological sites on the Refuge have been severely damaged by erosion, and some have probably vanished into the sea since they were reported. Archaeologists in the State Historic Preservation Office, universities, museums, and consulting firms working in Maine all agree that erosion is the greatest single threat to coastal archaeological sites in the state. If a concerted campaign is not undertaken soon to locate, monitor, and assess such sites for listing in the National Register of Historic Places, and preserve or conduct archaeological excavation of them, a major piece of the region's prehistory and early history will be lost forever.

Current looting of artifacts from eroding sites on the Refuge is not documented, but it is noteworthy that most of the prehistoric sites and one of the historic sites were reported by local residents who collected material from them prior to Federal ownership. Most of these sites contain clam shell, which makes them highly visible to anyone walking the shore or skirting it in a small boat.

No staff has taken the Federal Law Enforcement Training Center's Archaeological Resources Protection Act (ARPA) course. This severely hinders our ability to investigate looting violations. Even more notably, the absence of any visible day-to-day law enforcement presence on the islands makes enforcement virtually impossible unless it can be accomplished through public education and monitoring partnerships with agencies and communities that have an interest in Refuge lands and resources.

Strategies:

- continue to consult with the Maine Historic Preservation Commission regarding Refuge undertakings that have potential to affect

archaeological resources, performing archaeological studies of project areas as needed.

Within 5 years of CCP implementation:

- ensure that an ARPA message is incorporated into Refuge brochures, including those produced by Refuge partners, following Leave No Trace themes.
- perform surface surveys of selected Refuge island shorelines to locate archaeological resources at risk from coastal erosion or artifact looting. The late Dr. Douglas C. Kellogg developed a model for both the location of such coastal sites and an assessment of erosion impacts upon them (Kellogg, 1982). A testing of his model may be a good starting point to focus this effort. Develop site management and protection plans as warranted.
- ensure that at least one staff person receives ARPA training.
- hire GS-7 and GS-9 law enforcement officers to help administer the program and conduct visitor outreach (same positions as Objective 6.4).
- produce a Cultural Resources Management Plan. This plan will include a prioritized program to perform additional surveys as properties are acquired, and a systematic program to monitor erosion and looting of known sites, as well as a management program for historic structures on the Refuge. The plan will also identify areas with a high probability of containing archaeological sites. Consult with the Maine Historic Preservation Office and Tribal Historic Preservation Office in developing this plan.

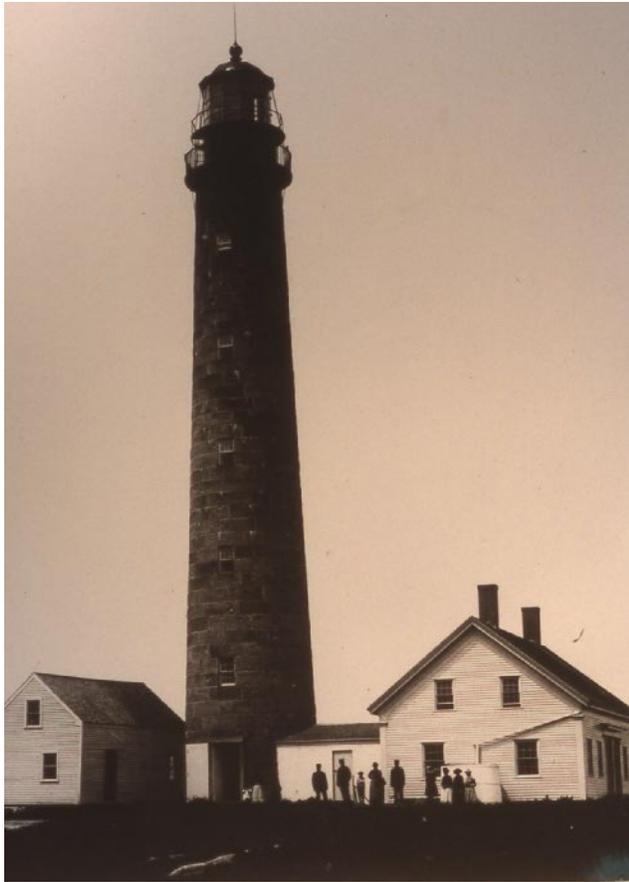
Objective 7.8 (Historic Resources)

Within 2 years of CCP approval, establish an annual program of historic lighthouse maintenance on the Refuge to meet the Department of the Interior's historic preservation standards.

Background: The National Historic Preservation Act considers deterioration of historic structures as an adverse effect upon them. Historic structures, currently limited to four lighthouse stations (Petit Manan Island, Libby Island, Matinicus Rock, and Egg Rock), were all in various states of repair when acquired by the Service. Most of these structures have received repairs since acquisition, but all require further repairs to place them in stable condition. Establishment of a regular program of cyclical maintenance, involving items such as painting and roofing repairs, will also be essential to protect these structures from further deterioration. These structures are perceived by the general public, preservation advocates, and historians as among the most significant in Maine, and their preservation is a trust responsibility for the Service.

Strategies:

- continue to consult closely with the Maine Historic Preservation Commission regarding repairs and annual and cyclical maintenance to the four National Register listed light stations on the refuge.



Historic photo of Petit Manan Island Lighthouse
Photo from The National Archives

Within 5 years of CCP implementation:

- develop a formal agreement with U.S. Coast Guard (USCG) to coordinate USCG maintenance activities on lighthouse islands and to insure there will be minimal disturbance to nesting seabirds; address timing of routine maintenance activities, develop protocols for USCG access to lighthouse islands for emergency activities; establish what logistical support can be provided to USCG.
- establish formal relationship with Friends of Nash Island Light and Friends of Franklin Island Light; utilize MOUs, Challenge Grants, and cooperative agreements as needed to support work.
- complete an inventory of maintenance needs necessary to bring each lighthouse to national and State preservation standards; incorporate needs into MMS system. Seek alternative funding sources and pursue partnerships to accomplish priority work.
- establish “Friends of Lighthouse” groups on Libby and Two Bush Islands, Egg Rock, and Matinicus Rock. Friends groups will work toward developing political and public support for maintenance of these historical structures

and developing interpretation and educational programs related to the history of lighthouses on the Maine coast.

- establish a relationship with national lighthouse preservation organizations; seek mutually beneficial partnerships.

Goal 8: Communicate and Collaborate with Local Communities, Federal, State, Local, and Tribal Representatives, and Other Organizations throughout Coastal Maine to Further the Mission of the National Wildlife Refuge System

Objective 8.1 (Research Partnerships)

Expand existing research partnerships to further our knowledge and understanding of Maine coastal ecosystems and the Federal trust resources which depend on them.

Background: Fortunately for us, the Refuge is sought after as a place to conduct research on undeveloped coastal environments. We have obtained a tremendous amount of information through research partnerships. This has particularly benefited us as we have not had the staff or funding to accomplish this work on our own. Some of the current research partnerships include: an Arctic tern and Atlantic puffin metapopulation study with the University of New Brunswick, Canada, a common eider survival and recruitment study with MDIFW and U.S. Geological Survey (USGS), and a purple sandpiper study with MDIFW and Acadia National Park. We would continue these research partnerships and encourage new ones to

enhance our ability to achieve our goals and objectives. We have identified several potential research projects under our biological objectives that we hope to pursue in the near future.

Strategies:

- continue partnership with Humboldt Research Station under a special use permit to provide outdoor laboratory opportunities on Refuge lands; seek an expansion of their activities to include inventory and monitoring of resources.
- continue research partnerships with MDIFW and other State agencies, USGS, NPS, NAS, and universities, and initiate new ones, that are directly beneficial to the Service on a local, regional, or national level.

Within 5 years of CCP implementation:

- insure all entities currently operating on Refuge lands are under a cooperative agreement, memorandums of understanding, and/or special use permits. All agreements should include a provision to annually share data and reports.
- in cooperation with partners, identify the highest priority research needs for the Refuge which will further the conservation and management of Federal trust resources. Refer to all proposed research projects identified under the biological objectives in this CCP.
- with priority research needs identified, cooperate with research facilities, educational institutions, and other agencies to establish research goals and methodology.
- Refuge staff will engage in developing research study designs, conducting field work, and writing publications to raise the visibility of the Refuge System within the research community and to elevate our contribution to science-based management. Staff will co-author papers on a regular basis.
- annually investigate alternative sources of funding to support research activities on Refuge lands.
- annually investigate and secure housing for researchers, interns, and biological technicians.

Objective 8.2 (Law Enforcement Partnerships)

Initiate partnership with other Federal, State, and local enforcement agencies and Tribal Nations to further the conservation and protection of Federal trust resources.

Background: Law enforcement staff plays an important role on the Refuge. Officers not only enforce regulations, but just as importantly, they conduct outreach and serve to raise the visibility of the Service in local communities while out on patrol.

It will be even more important in the future, should we implement this alternative with new programs and new regulations, that we have the capability to alert people to these changes and can enforce them, as necessary. We believe that a law enforcement partnership could substantially increase our ability to effectively manage and conserve Refuge resources.

Strategies:

Within 5 years of CCP implementation:

- hire GS-7 and GS-9 law enforcement officers to facilitate partnership and conduct visitor outreach (same positions as Objective 6.4).
- establish annual meeting with the local MDIFW game warden prior to and during hunting season to identify and monitor concerns.
- develop MOUs with Federal (e.g. Coast Guard), State and local law enforcement agencies, including Maine DMR and MDIFW game wardens, to establish agreements for back-up assistance, Refuge patrol, and the sharing of radio frequencies.

Objective 8.3 (Community Outreach)

Within 7 years of CCP approval, through increased community outreach, 65% of adults contacted who reside within 10 miles of refuge lands, will know the Refuge exists, that it is part of a national system of refuges, and can identify its management priorities for migratory bird conservation and seabirds.

Background: This objective strives to develop an effective outreach program targeted at Maine coastal communities whose residents may not be aware that a national wildlife refuge is nearby. It is particularly important that local residents understand, appreciate, and support the Refuge System mission and this Refuge's unique contribution to that mission. In addition, our volunteer program could grow and our Friends of Maine Seabird Islands groups could see enhanced membership and support. The proposed Refuge Headquarters and Coastal Education Center will serve as an important resource for Mid-coast residents, providing meeting and exhibit space for local conservation organizations, as well as educational and recreational opportunities.

Our current outreach program includes regular submissions of news releases and a biweekly column relating Refuge news and issues to local newspapers. We also provide at least four presentations annually to local civic organizations and staff a Refuge booth at approximately four fairs, sporting shows, or other community events.

Over the past few years as the Refuge has grown, and we have conducted more extensive outreach, we have noticed some confusion over the Refuge's name as "Petit Manan NWR Complex." This name made no sense to individuals who did not have an historical context. As such, under this alternative, we are recommending the name of the refuge complex be changed to "Maine Coastal Islands National Wildlife Refuge" to better reflect the Refuge's mission and its geographic context.

Strategies:

Within 5 years of CCP implementation:

- annually coordinate with Moosehorn and Rachel Carson refuges on outreach and education.

- regularly participate in Chamber of Commerce and other community events in Maine coastal towns where effective outreach of Refuge programs can occur.
- develop survey protocol to measure success with meeting objective.
- develop a Refuge video for use at on-refuge and off-refuge events.
- purchase a new phone system for the Refuge Headquarters that will provide current Refuge regulations, island openings/ closings, and upcoming events for Refuge offices.
- expand the existing Friends of Maine Seabird Islands Group based in Rockport to include a second chapter in downeast Maine. This will enhance the Refuge staff's capability of meeting Goals 1 through 7 above. Develop recruitment strategies with Regional Friends Coordinator; consider workshops and attracting people through the media.
- publish a quarterly newsletter; utilize volunteers, interns, and Friends Group for publication.
- hire a Volunteer Coordinator (GS-7) to plan and implement volunteer programs.
- complete development of a guide for island owners interested in island stewardship practices
- initiate administrative actions to change the name of the refuge complex to "Maine Coastal Islands National Wildlife Refuge"

Objective 8.4 (Elected Officials Outreach)

Within 5 years of CCP approval, 75% of all Federal, State, and local elected officials representing the surrounding Refuge communities will have visited the Refuge, and will understand its significance to migratory birds and other native wildlife.

Background: Gaining Congressional, State, and local elected officials support for Refuge programs is essential to meeting our goals. This can only happen when these elected officials understand and appreciate the nationally significant contribution of the Refuge and its programs to the permanent protection of Federal trust resources. We need to impress upon them the importance of refuge lands to current and future generations of Americans.

We are proud of our relationship with the Maine Congressional delegation, and have benefited by their involvement in recent years. Our relationships are not as strong with State and local elected leaders, and we hope to improve upon this situation with actions identified below.

Strategies:

Within 5 years of CCP implementation:

- continue annual Capitol Hill visits begun in 2001 and brief Congresspersons and staff on Refuge programs and projects.
- insure public offices receive all notices of Refuge events.

- host an annual field visit for elected officials and local community leaders to familiarize them with Refuge management priorities and issues.

Objective 8.5 (Adjacent Landowners Outreach)

Within 5 years of CCP approval, 80% of adjacent landowners will have been personally contacted by Refuge staff at least once in an effort to improve local community relationships and secure local support for Refuge management activities.

Background: As a public land management agency, it is very important to us that we are viewed as responsible and conscientious neighbors. Keeping in touch with adjacent landowners makes good business sense as it would serve to strengthen support for the Service and Refuge activities in the local communities. We have not had formal meetings with adjacent landowners or landowner associations to date. We periodically meet with landowners adjacent to our mainland divisions while in the field, but it has been infrequent and has been more on an opportunistic basis rather than planned. Our ability to meet with island landowners is more difficult. In recent years, we have deferred to local land trusts to contact and inform island owners of some of our activities. Under this alternative, we would like to conduct more direct outreach to adjacent landowners to improve our relationships.

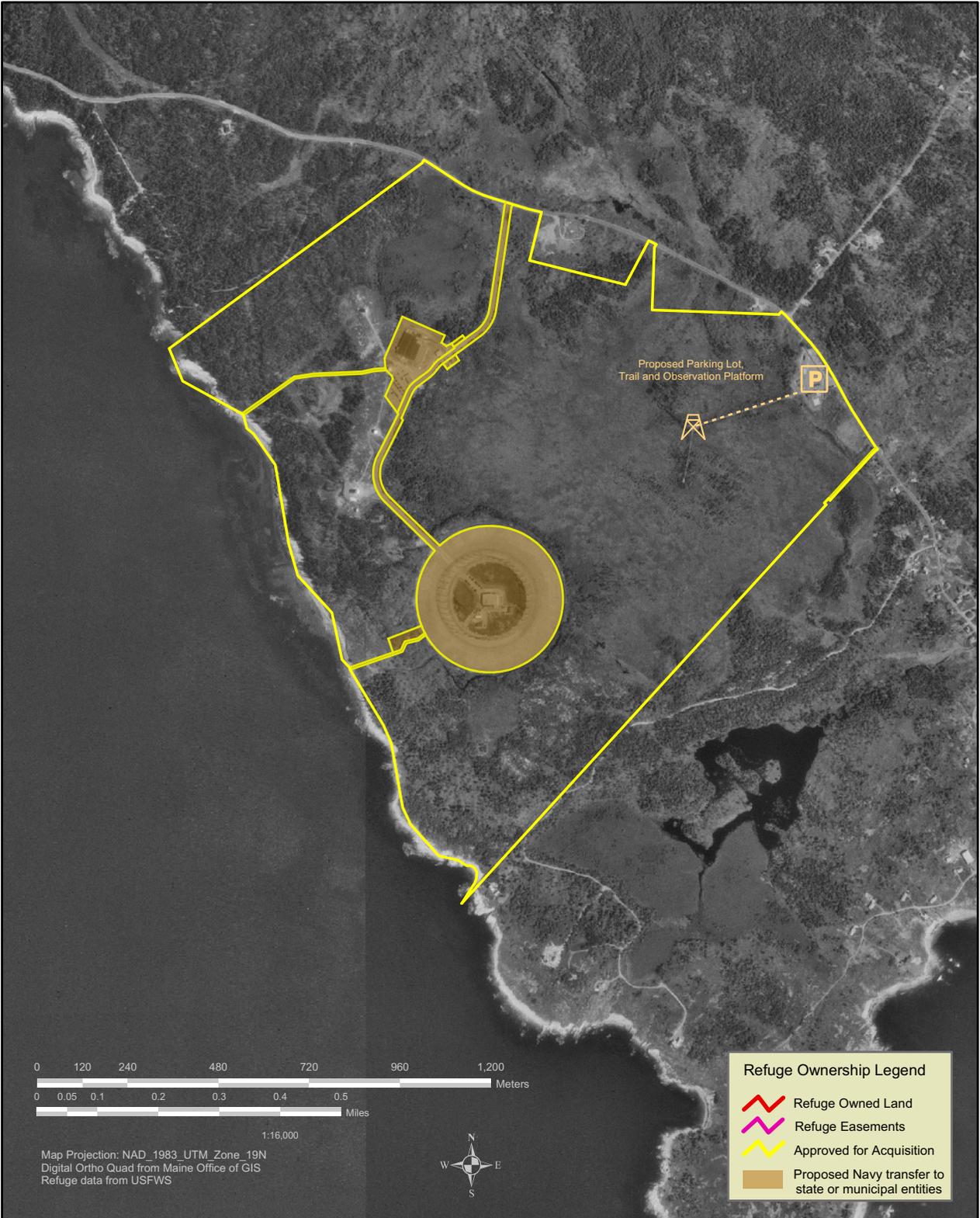
Strategies:

Within 5 years of CCP implementation:

- compile an adjacent landowner mailing list; insure adjacent landowners receive notices of Refuge events and receive Refuge newsletters. Offer to meet with any landowner with an interest in learning more about Refuge activities.
- meet annually with Section 1 landowners on Petit Manan Point.
- meet with adjacent landowners to the Sawyers Marsh and Gouldboro Bay divisions.
- meet with the following land trusts: Damariscotta River Association, Boothbay Region Land Trust, Vinalhaven Land Trust, and Harpswell Region Land Trust.
- meet with Star Island Corporation to discuss management on Smuttynose Island.
- meet with landowners on Bois Bubert and Metinic islands.
- identify where homeowners organizations exist adjacent to Refuge lands, establish a contact, and attend meetings where Refuge outreach is appropriate.
- personally contact owners of islands proposed for Service acquisition; offer to meet with anyone interested in learning more about Service programs and policies.

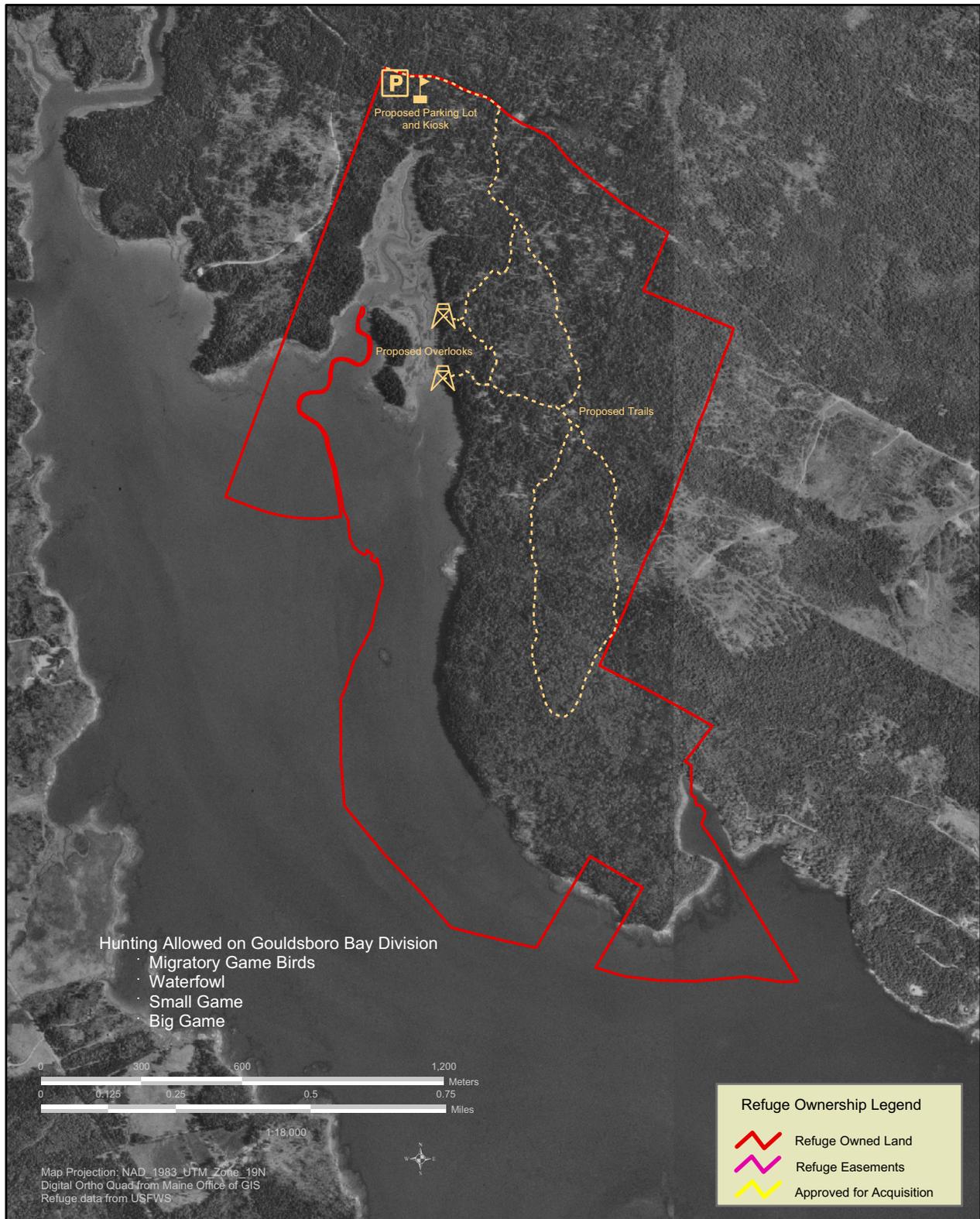


**MAINE COASTAL ISLANDS NATIONAL WILDLIFE REFUGE
COMPREHENSIVE CONSERVATION PLAN AND ENVIRONMENTAL IMPACT STATEMENT
Corea Heath Division Public Use**



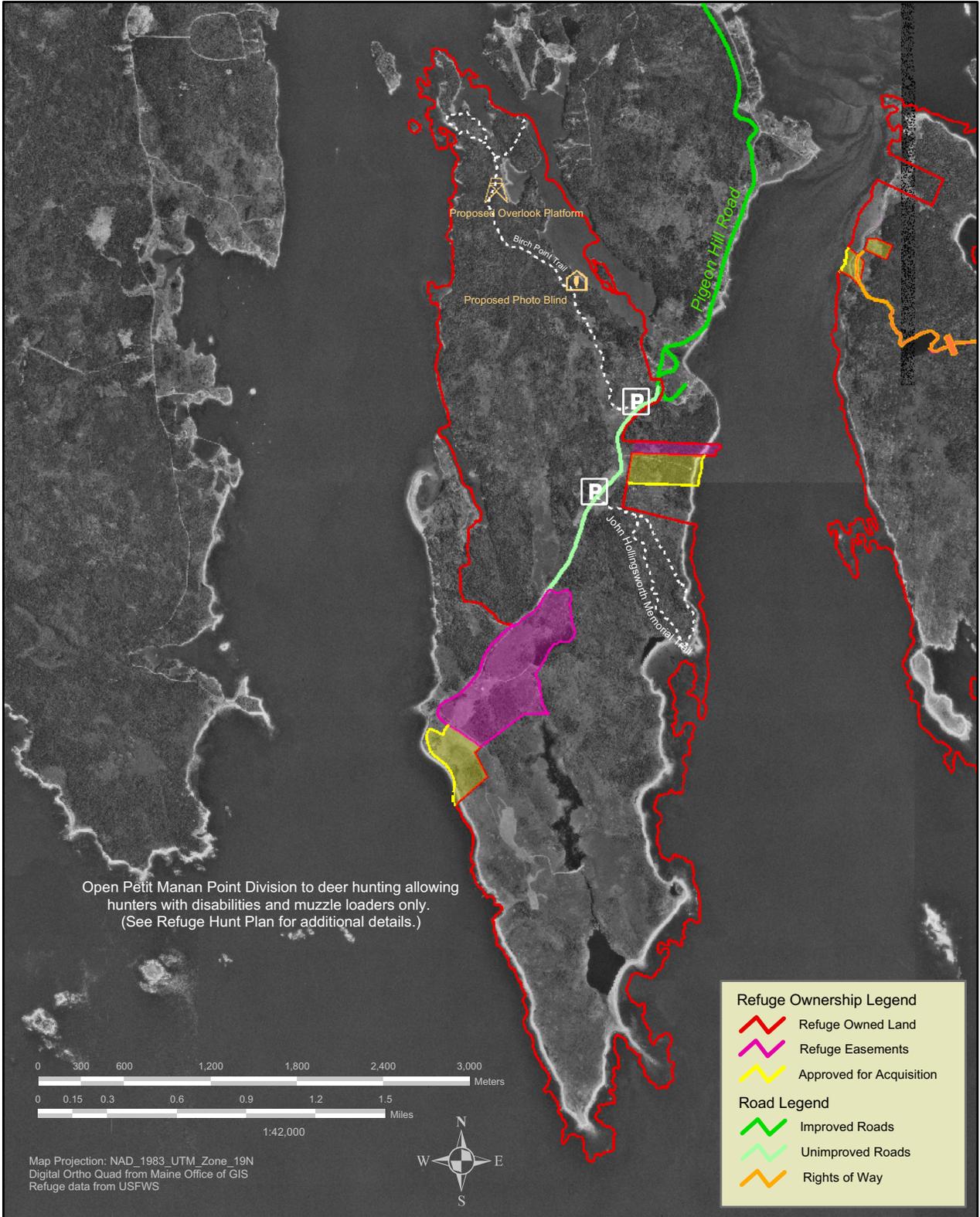


MAINE COASTAL ISLANDS NATIONAL WILDLIFE REFUGE
COMPREHENSIVE CONSERVATION PLAN AND ENVIRONMENTAL IMPACT STATEMENT
Gouldsboro Bay Division Public Use





MAINE COASTAL ISLANDS NATIONAL WILDLIFE REFUGE
COMPREHENSIVE CONSERVATION PLAN AND ENVIRONMENTAL IMPACT STATEMENT
Petit Manan Point Division Public Use





MAINE COASTAL ISLANDS NATIONAL WILDLIFE REFUGE
COMPREHENSIVE CONSERVATION PLAN AND ENVIRONMENTAL IMPACT STATEMENT
Sawyers Marsh Division Public Use

