

**ISLAND-NESTING TERN
MANAGEMENT SYSTEM AND DATA BASE**

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**MAINE DEPARTMENT OF INLAND FISHERIES AND
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PART I: ISLAND-NESTING TERN MANAGEMENT SYSTEM

INTRODUCTION

This document describes the system by which the Maine Department of Inland Fisheries and Wildlife (MDIFW) makes decisions concerning management and habitat protection for three species of Endangered, Threatened or rare terns nesting on Maine's coastal islands. Part I outlines the decision-making process by which biological information is used to make management and habitat protection decisions. Part II details techniques for measuring biological and habitat parameters used as inputs for decision-making and documents databases for storage of biological and habitat information. Goals and objectives for island-nesting tern management are restated here. However, supporting documentation of these species' natural history and status can be found in the Island-nesting Tern Assessment (MDIFW 2006). The updated goals and objectives were established by a public working group in November, 2006.

Maine's island-nesting terns include the Common Tern (*Sterna hirundo*), the Arctic Tern (*S. paradisaea*), and the Roseate Tern (*S. dougalii*). Maine is near the southern limit of the breeding range for Arctic Tern, the northern limit for the breeding range for Roseate Terns, and central in the breeding range of the Common Tern. Arctic and Roseate Terns nest exclusively on coastal islands. Common Terns nest primarily on coastal islands but a small fraction of the population nests on islands on a few inland lakes. This management system deals only with the coastal island-nesting tern population. All three species exhibit important differences in their distribution and habitat needs. Arctic Terns feed off-shore and tend to nest on the outer coastal islands. Common Terns tend to feed inshore and historically their nesting islands were located closer to the mainland. Roseate Terns sometimes feed in shallow water over sand bars and seem

to favor dense beach pea clumps or other rank vegetation for nesting. The availability of Roseate Tern feeding areas may limit the number of suitable nesting islands for this species. The Roseate Tern is federally listed as Endangered by the U. S. Fish and Wildlife Service (USFWS) and by MDIFW under provisions of the Maine Endangered Species Act as State-Endangered. Arctic and Common Terns are not listed by the USFWS. However, the Arctic Tern is classified as State-Threatened and the Common Tern is classified as a “Species of Special Concern” on MDIFW’s list of rare and endangered wildlife (Appendix 1). For these reasons, Common and Arctic Terns do not receive the stringent protection afforded endangered species, but still require management programs to enhance their populations.

Beginning in the 1960s, coast wide censuses of island-nesting terns in Maine were conducted by Dr. William Drury and others. The USFWS conducted a coast wide colonial waterbird survey in the mid 1970s (Korschgen 1979). Since this period, a collaboration of private organizations and state and federal government agencies referred to as the Gulf of Maine Tern Working Group (GOMTWG) began to census terns in the 1980s until today. More recently the acronym GOMTWG was modified to reflect a greater-encompassing species representation of seabirds and is now called the Gulf of Maine Seabird Working Group (GOMSWG).

Intensive “hands-on” tern management began in the 1980s when USFWS and National Audubon Society (NAS) controlled gulls to reestablish Arctic, Common, and Roseate Tern colonies on Petit Manan, Eastern Egg Rock, Matinicus Rock, Seal Island, and Stratton Island. More recently, tern restoration sites have been established on Ship, Outer Green, Jenny, Pond, East Brothers and Metinic Islands.

MDIFW currently manages 301 state-owned coastal islands and ledges, including 70 historic or current tern-nesting islands, within its Coast of Maine Wildlife Management Area. The Department also maintains a database on seabird nesting islands, participates in tern surveys, and plays a major role in protecting habitat for terns and other coastal wildlife. Since 1990, MDIFW and its partners have continued to work together to update and develop strategies to achieve the established goal and subsequent objectives. MDIFW management goals and objectives remain consistent with the original Gulf of Maine Tern Management Plan (Drury and Melvin 1990) and the USFWS Roseate Tern Recovery Plan.

REGULATIONS

All three species of island-nesting terns are protected by both federal and state laws. The Migratory Bird Treaty Act of 1918 protects all three species from take and harassment. The Roseate Tern is federally listed as Endangered by the USFWS and thus is also protected from take and harassment under provisions of the U.S. Endangered Species Act of 1973. The Endangered Species Act also prohibits activities of federal agencies, or activities funded or permitted by federal agencies, from adversely impacting Roseate Terns or their habitats. Authorization for capture, banding, or other activities that are directed at Roseate Terns and controlled by the U. S. Endangered Species Act must be granted by the Regional Director of the USFWS. Research or management activities directed at federally Endangered or Threatened birds must also be authorized by the MDIFW.

The Roseate Tern is also classified as Endangered by the Maine Department of Inland Fisheries and Wildlife (MDIFW) under provisions of the Maine Endangered Species Act of 1975. The Act protects state Threatened or Endangered species, such as the Roseate Tern, from take and harassment. It also authorizes MDIFW to designate Essential Habitat that is critical to the conservation of Endangered or Threatened species, and to promulgate and enforce guidelines for the protection of Essential Habitat (Appendix 6). State agencies and municipal governments may not permit, license, fund, or carry out projects that significantly alter habitats identified as essential or that violate protection guidelines. Finally, the Act requires that a permit be obtained from MDIFW in order to use bait, decoys, or recordings to attract, move, or otherwise manipulate populations of Roseate Terns or other state-listed species. Common Terns, a Species of Special Concern (an administrative category used by MDIFW) are not protected by Maine's Endangered Species Act.

Habitats of Roseate, Common, and Arctic Terns also receive regulatory oversight by the Maine Department of Environmental Protection (DEP) as "Significant Wildlife Habitat" under provisions of the Natural Resources Protection Act of 1988 (Appendix 4). The Land Use Regulatory Commission has jurisdiction over islands in unorganized towns and has zoned several seabird nesting islands as fish and wildlife protection districts (P-FW). Also, Maine's Comprehensive Planning and Land Use Regulation mandates MDIFW to provide information on rare species habitats, including tern nesting islands, to the Department of Economic and Community Development for use by towns for comprehensive planning purposes. A Scientific Collecting Permit (with banding and marking authorization) from MDIFW is required before terns, their young, or eggs can be captured, collected, or handled.

MDIFW's Coast of Maine Wildlife Management Area comprises several tern-nesting islands. By rule, MDIFW closes these islands to public access from April 15th – August 31st each year. A letter of permission from MDIFW is required to land during the nesting season on these islands. Day-use (no pets, no fires) is permitted outside of these dates.

MANAGEMENT GOAL AND OBJECTIVES

Updated goal and objectives for island-nesting terns in Maine were established through recommendations made to MDIFW by a Public Working Group in November, 2006. The original goal and objectives were adopted by MDIFW's Commissioner and Advisory Council in 1990.

MANAGEMENT GOAL

Increase the abundance, expand the distribution, and ensure the long-term viability of all three island-nesting tern species (Common, Arctic, and Roseate Terns) in Maine.

MANAGEMENT OBJECTIVES

POPULATION

Objective #1: By 2021, increase the five-year average populations of all island-nesting tern species to at least 10,000 pairs of Common Terns; 6,000 pairs of Arctic Terns; and 300 pairs of Roseate Terns.

PRODUCTIVITY

Objective #1: By 2011, increase or maintain productivity of Roseate Tern colonies to sustain a five-year productivity average of ≥ 1 fledged chick/pair at three core colonies, each of which support more than 50 pairs of Roseate Terns.

Objective #2: By 2016, increase or maintain productivity of Arctic Tern colonies to sustain a five-year productivity average of ≥ 1 fledged chick/pair at three core colonies, each of which support more than 1,000 pairs of Arctic Terns, and three other core colonies, each of which support more than 400 pairs of Arctic Terns.

Objective #3: By 2016, increase or maintain productivity of Common Tern colonies to sustain a five-year productivity average of ≥ 1 fledged chick/pair at four core colonies, each of which support more than 1,500 pairs of Common Terns, and six other core colonies, each of which support more than 500 pairs of Common Terns.

Objective #4: By 2016, increase the number of minimally managed tern-nesting islands to at least 20 islands, each of which sustain a five-year productivity average of ≥ 0.5 fledged chick/pair.

DISTRIBUTION

Objective #1: By 2011, maintain the current core of nine managed tern colonies, while increasing the number and distribution of productive colonies, to ensure that there is at least one productive colony in each of Maine's eight coastal regions that supports at least 200 pairs of terns.

HABITAT

Objective #1: By 2011, identify and conserve a suite of islands in each of Maine's eight coastal regions that have at least a short term potential of supporting nesting terns.

Objective #2: By 2011, document and conserve principal island-nesting tern staging and foraging areas.

MANAGEMENT ASSUMPTIONS

The management goal and objectives address a 5-15 year target for abundance, distribution, and productivity that, if achieved, would contribute to each species' long term viability. These are short-term goals and objectives and should be considered minimum goals and objectives that will contribute to the long-term recovery of these species. The goal and objectives are based on several assumptions.

Management Goal Assumptions

- Competition and predation by Herring and Great Black-backed Gulls are the primary factors limiting the abundance and distribution of island-nesting terns in Maine. Predators and human disturbance limit abundance and productivity at some nesting islands.
- Abundance is gauged by the number of nesting pairs of terns each year.
- Previous management efforts (e.g. acquisitions of islands, gull removal programs, habitat enhancement) have contributed significantly to the initial stages of species recovery.

Management Objective's Assumptions

- Adequate food resources exist to support 1930s-level tern populations. The abundance and distribution of tern nesting islands in 1930 is assumed to approximate pre-exploitation conditions.
- The quality and quantity of wintering habitat is adequate to support 1930s-level tern populations.
- All 3 species must reach abundance, distribution, and productivity objectives before the management goal will have been achieved.
- Abundance, distribution and productivity objectives include terns nesting on Machias Seal Island on the Maine/New Brunswick border. Dynamics of tern populations on Machias Seal often have a profound effect on terns on other islands along the Maine coast.
- Productivity refers to number of young fledged/territorial nesting pairs.
- The Public Working Group defined productive tern colonies as those having an average productivity of ≥ 1 chick(s) fledged/adult pair. This level of productivity is ambitious,

even for Maine's best tern colonies. Furthermore, annual tern productivity fluctuates greatly, and there can be a great amount of sampling error inherent in obtaining productivity estimates at managed colonies. Because of these factors, it is likely more realistic to assume a productive colony should average ≥ 0.8 chicks fledged/pair. This will be the productivity objective used by MDIFW for evaluating the tern management program.

- Gull management, which includes reducing or eliminating gull populations by lethal methods, and island use restrictions (i.e. no trespassing during the nesting season) may be viewed as undesirable by some people and must be managed and handled accordingly.
- The future of Maine's tern populations is dependent on human intervention (i.e. gull control and tern wardens during the nesting season with on-going gull control over many years). If current levels of management are maintained, tern populations would be expected to remain at, or near, the current level. If existing management programs are reduced or eliminated, tern populations would be expected to decline. Expanded management efforts are expected to result in increased tern populations.
- Recreational use of these islands by unsupervised people, recreational camping and associated pets during the nesting season will compromise nesting success and reduce the probability of achieving population and distribution goals.

Population Objective Assumptions

- Technically and biologically, achievement of these objectives is entirely dependent on the Department's ability to work with partners (especially the USFWS and NAS) to

continue to maintain or establish new restoration sites with intensive management programs.

- Acquisition of an annual source of funding for these programs by the Department is essential for the desired outcomes.
- Habitat is not a limiting factor due to sufficient numbers of islands that exist in Maine with suitable habitat. These islands have potential habitat that is capable of supporting populations of terns equal to or greater than the goals and objectives. Adequate potential nesting habitat can be maintained in each of the 8 coastal regions.
- Success of the terns in many of these existing suitable habitats must factor in the obstructive presence of predatory gulls and be managed accordingly.

Productivity Objective #1 Assumptions

- An objective to increase the number of productive Roseate Tern colonies is compatible with the Federal Roseate Tern Recovery goal of 5,000 breeding pairs nesting at a minimum of 6 large, productive colonies from New York to Maine.
- Abundance and productivity can be measured accurately and uniformly in managed Roseate Tern colonies.
- Roseate Tern nesting viability is highly dependent on the success of nesting pairs at a few core colonies. Increasing the number of birds at these few core colonies will enhance the stability of the state's breeding population.
- Intense habitat management, which includes a long-term presence of researchers, nearly annual maintenance, predator control (reducing or eliminating gull populations) and restricted human use of the Roseate Tern breeding area is essential for Roseate Terns nesting success.

Productivity Objective #2 Assumptions

- Arctic Tern nesting viability is highly dependent on the success of relatively small numbers of nesting pairs at a few core colonies. Increasing the number of birds at these few core colonies will enhance the stability of the state's breeding population.
- Primary causes of breeding failure for Arctic Terns are predation, weather, flooding, food shortages, and disease. Recent studies show that their populations have not shown significant improvements despite intensive management.
- Habitat conditions at three important Arctic Tern nesting sites can support this objective, but a long-term presence of researchers and nearly annual maintenance of the habitat will be required.
- Expending additional resources on some of the more offshore sites which Arctic Terns prefer will facilitate the development of the three additional core colonies that support more than 400 pairs. Unless this happens, the long-term productivity objective (as stated in the objective) of ≥ 1 fledged chick/pair may not be as feasible.

Productivity Objective #3 Assumptions

- Common Tern nesting viability is highly dependent on the success of a significant portion of the state's pairs nesting at a few core colonies. Increasing the number of birds at these few core colonies will enhance the stability of the state's breeding population.
- Despite surpassing the previous goal for this species, Common Terns face numerous threats which affect their breeding success, including predation, human disturbance, weather, flooding, food shortage, and contaminants.

Island-nesting Tern Management System

- Islands on which little or no management occurs habitually experience low numbers of nesting pairs and reduced productivity.
- Habitat conditions at four important Common Tern nesting sites can support this objective, but a long-term presence of researchers, and nearly annual maintenance of the habitat, will be required.

Productivity Objective #4 Assumptions

- Many of the sites with small tern populations are owned or are under the management authority of MDIFW. However, several important islands are privately owned, and cooperative management relationships would need to be developed.
- In 2006, terns nested on 13 islands that are not currently core seabird restoration sites. Displacement by predators and human-related activities are the primary factors limiting terns' use of dozens of small islands historically known to support nesting terns. The habitat is capable of supporting this objective.
- Financial responsibilities for predator control and reduction of human-related disturbance on these islands (signage and site visits) should be borne by the Department.

Distribution Objective Assumptions

- Increasing the number and distribution of nesting colonies of terns in Maine will decrease the vulnerability of these populations to catastrophic events.
- Establishing new tern colonies requires predator control, attraction techniques, with on-site presence of researchers throughout the summer.

- These intensive, long-term management approaches involve great cost and must have a stable financial commitment by the Department, and consideration of this is pertinent to the project's success in times of the financial strain currently occurring.

Habitat Objective #1 Assumptions

- The Department will work with landowners and conservation partners to acquire a fee title, conservation easement, management agreement, or other protection strategies over the planning period.
- Acquisition of seabird nesting islands is highly desirable and an effective way in which to protect breeding colonies which will increase the stability of Maine's tern breeding populations by reducing their vulnerability to decline from catastrophic events.
- There are potential tern-nesting islands in private ownership within the eight coastal regions which are eligible for acquisition consideration.
- The transfer of ownership of a privately owned island to MDIFW will result in a loss of property taxes to some towns.

Habitat Objective #2 Assumptions

- If habitats beyond the nesting islands are not also managed accordingly, efforts on the nesting islands will have little value, and management must act accordingly.
- This effort requires effective cooperation, support, and funding from conservation partners, landowners, and the general public.
- These habitats beyond the nesting islands exist, but the identification and conservation of them should benefit a wide range of marine resources for them to be effective.

ISLAND-NESTING TERN DECISION-MAKING PROCESS

This management system provides a systematic framework for island-nesting tern management by MDIFW until the year 2021. The Department's goal of increasing the population and distribution of Maine's island-nesting terns drives the management decisions. Management decisions are outlined as a series of yes or no answers to questions related to island-nesting tern abundance, distribution and productivity (Figure 1), and habitat protection (Figure 2).

Responses to questions are based on evaluation of all input criteria and the flow charts guide the manager to the appropriate management options.

INPUT CRITERIA FOR ISLAND-NESTING TERN POPULATION MANAGEMENT

The following criteria are used to guide management decisions concerning the population, distribution, and productivity for Common, Arctic, and Roseate Terns in Maine. Criteria are dictated by the goals and objectives of the island-nesting tern assessment and the assumptions listed in this management system. Special decision-making criteria are instituted for Roseate Terns because of their unique federal and state endangered species status.

FIG. 1. Population management decision-making for island-nesting terns.

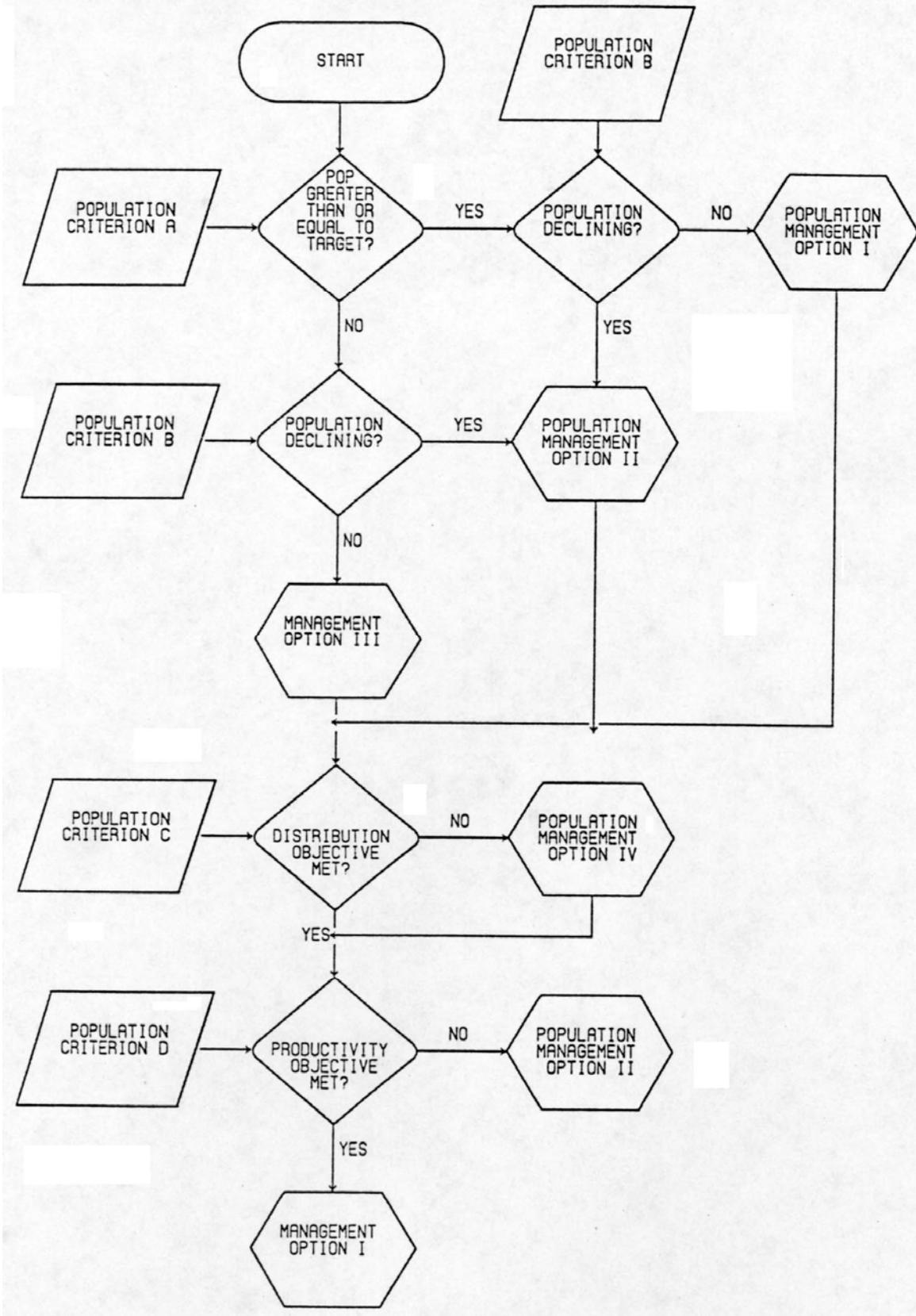
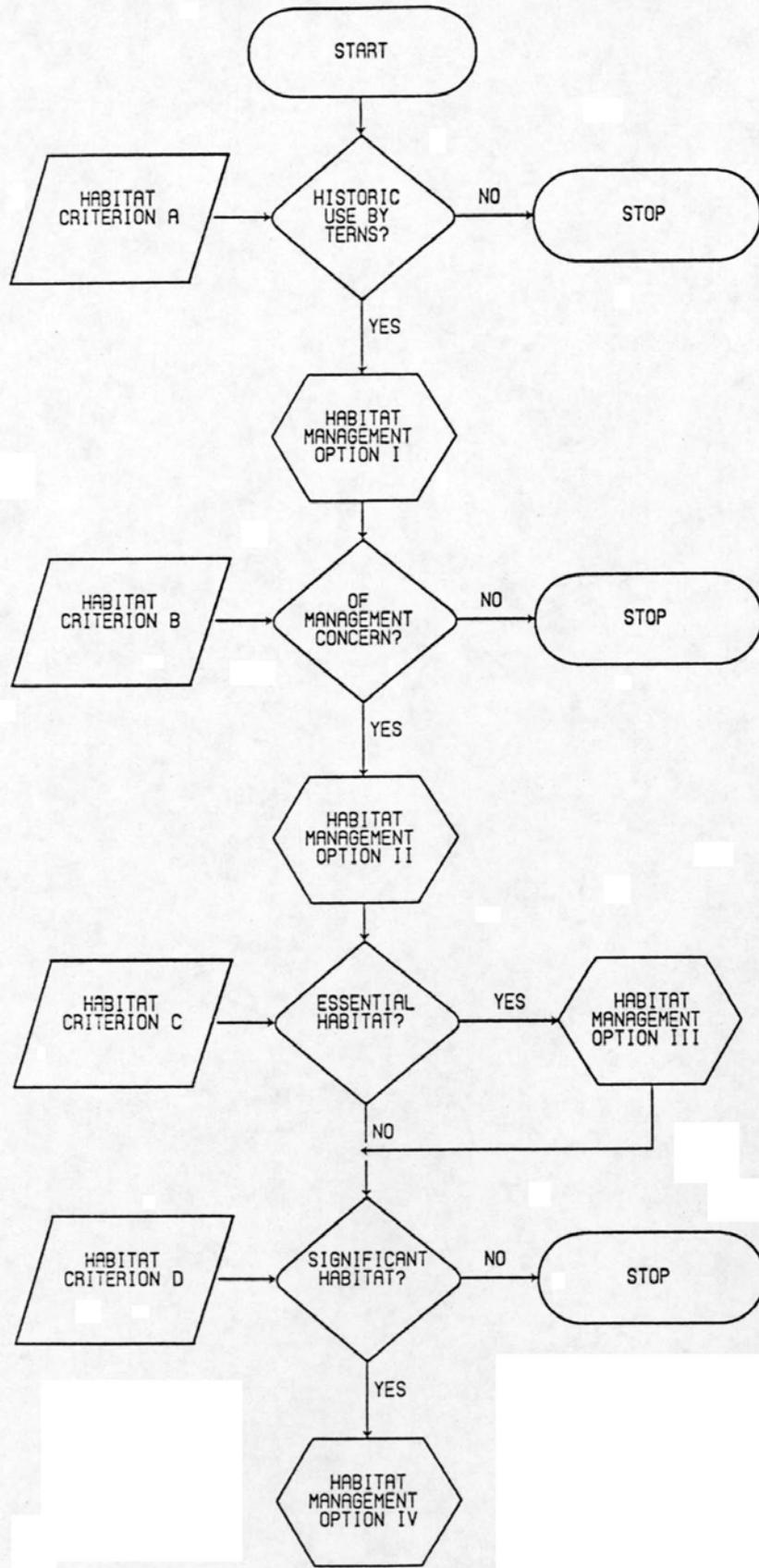


Fig. 2 Habitat protection decision-making for island-nesting terns.



Population Criterion A – Breeding Population Size

This input addresses the population abundance goal. It answers the question: “Has the population goal for all three species been met or exceeded for a minimum of 5 out of the 7 most recent years as measured by annual coastwide surveys?”

The population goals are 10,000 pairs of Common Terns, 6,000 pairs of Arctic Terns, and 300 pairs of Roseate Terns. If population goals are not achieved for any of the three species, the island-nesting tern population is judged below target.

Abundance is measured by the number of nesting pairs and is expressed as the total number of nesting pairs/species, as determined by a coast-wide survey conducted annually. The survey is conducted following procedures described in Appendix 2, which were adopted from GOMTWG (Drury and Melvin 1990). MDIFW, working with conservation partners, facilitates survey assignments and participates in the survey each year. The list of historic nesting islands, maintained in MDIFW’s databases, provides the basis for the list of islands to be surveyed annually. MDIFW’s ICENSUS Database (See Part II: Database) serves as the final repository and reference source for census data. The 1977, 1984, 1987-91 GOMTWG survey data serve as the baseline data to assess population objectives.

Population Criterion B – Breeding Population Decline

This input addresses the question: “Is Maine’s breeding population of Roseate, Common, and Arctic Terns declining?” The numbers of breeding pairs of Roseate, Common, and Arctic terns from annual coast-wide censuses (Appendix 2) are used to answer these questions. An answer of

“yes” to either of the two following questions indicates population decline in the state. 1) Has the count of breeding pairs of any of the three species declined by 20% or more since the previous year’s count? 2) Does any one of the simple linear regression lines fitted to the 5 most recent years’ population estimates for each species, have a negative slope equal to or in excess of 5%? If any one of the 3 species is decreasing (i.e. a negative slope equal to or in excess of 5%) the answer is “yes”.

Population Criterion C – Island-nesting Tern Distribution

This input addresses the population distribution objective. It answers the question: “Has the population distribution objective for each of the three species been met for a minimum of 5 of 7 preceding years as measured by annual coast wide surveys?”

The population distribution objective is one productive (see Criteria D for a definition of “productive”) colony of greater than 200 collective pairs (sum of all 3 species) in each of 8 coastal regions by the year 2000. MDIFW’s island-nesting tern assessment identifies the 8 coastal regions. A complete list of the 8 coastal regions for tern restoration is as follows:

- 1) The Down East coast between Machias Seal Island and Petit Manan (Winter Harbor to Cutler)
- 2) Blue Hill Bay (Brooklin to Southwest Harbor)
- 3) Inner Penobscot Bay (Camden to Deer Isle)
- 4) The Southwest approaches to Penobscot Bay (Port Clyde to Criehaven)
- 5) Mouth of the Kennebec River (Cundy’s Harbor to Georgetown)
- 6) Casco Bay (Cape Elizabeth to Cundy’s Harbor)
- 7) Saco Bay (Kittery to Cape Elizabeth)

- 8) Muscongus Bay (Bristol to Port Clyde) should be considered an eighth coastal region.
Tern restoration is ongoing at Eastern Egg Rock.

The short-term distribution objective for the endangered Roseate Tern is at least 3 productive colonies with > 50 pairs be established on the Maine Coast.

Distribution is assessed annually by enumerating productive tern colonies greater than 200 pairs in each of 8 coastal regions from annual coastwide tern surveys. The 1977, 1984, 1987-91 GOMTWG census data in MDIFW's Coastal Island Database serve as base data to assess distribution objectives.

Since annual tern numbers fluctuate widely, the distribution objective will be met for a coastal region if tern colonies > 200 pairs are present in at least 5 of the last 7 consecutive years.

Population Criterion D – Island-nesting Tern Productivity

This input addresses the population productivity objective. It answers the question: “Have the population productivity objectives for the 3 species been met for 4 of the 7 preceding years as measured on at least 4 managed tern nesting islands?”

The answer is “yes” if the coast-wide productivity for all three species is ≥ 0.8 fledged chick/pair for 4 of the preceding 7 years as measured on at least 4 managed tern nesting islands. The population productivity objective is that productive colonies, i.e. >200 nesting pairs, should produce ≥ 0.8 fledged chick(s)/pair. Tern productivity is measured on managed islands

according to standard guidelines originally developed by the GOMTWG (Drury and Melvin 1990; Appendix 2). Tern productivity currently is measured by the USFWS, NAS, and the GOMSWG partners annually at 6 colonies with more than 200 pairs.

POPULATION MANAGEMENT OPTIONS

Population Management Option I

- 1) Revise, if necessary, the Island-nesting Tern Assessment, Goals and Objectives, Problems and Strategies, and Management System.
- 2) Maintain current levels of management, colony monitoring, and habitat protection (Figure 2).
- 3) Determine recovery criteria for tern species listed as Endangered or Threatened.

Population Management Option II

- 1) Initiate studies to determine factors causing population decline, and identify colonies where declines are occurring.
- 2) Develop new management techniques to address limiting factors, including habitat protection (Figure 2).
- 3) Intensify management directed at limiting factor(s), as appropriate. Management options include:
 - Controlling resident gull population on managed islands
 - Managing vegetation and mineral soil to create suitable nesting sites.
 - Minimizing human disturbance by posting islands, public education, and increased enforcement presence during nesting season.
 - Promoting management to increase marine fisheries stocks utilized by terns.

- Initiating habitat protection programs including zoning and acquisition (Figure 2).

Population Management Option III

- 1) Devise strategies to counter factors negatively affecting tern numbers, as required.
- 2) Maintain management to encourage population growth.
- 3) Maintain habitat protection programs (Figure 2).

Population Management Option IV

- 1) Initiate habitat protection (e.g. Significant Wildlife Habitat and Essential Habitat, conservation, and acquisition) to maintain the integrity of historic and currently used tern nesting islands (Figure 2).
- 2) Expand intensive management to new nesting islands. Develop a priority ranking of islands for tern restoration in each of 8 regions. New islands will be chosen according to the following guidelines:
 - a. Terns are currently nesting;
 - b. Mammalian and avian predation is not a concern, or it can be controlled;
 - c. Location is consistent with objectives for geographic distribution;
 - d. Adequate food resources are likely available;
 - e. Suitable nesting substrate is present;
 - f. The island's location and topography make it practical to camp and to maintain a field crew from mid-May to the first of August;
 - g. Owners are interested and will allow a field crew;
 - h. Present or potential levels of pollution are not considered prohibitive;
 - i. The affect of tern restoration on other nesting seabirds.

- 3) Increase the number of productive Roseate Tern colonies by prioritizing restoration efforts to historic nesting islands with appropriate habitat, or islands that are near the mainland and adjacent to shallow sand or gravel bars to optimize feeding opportunities.

INPUT CRITERIA FOR ISLAND-NESTING TERN HABITAT MANAGEMENT

The following criteria are used to guide management decisions concerning habitat monitoring and protection for Common, Arctic, and Roseate Terns in Maine. Habitat protection is dictated by Population Management Options I, II, III, and IV.

Habitat Criterion A – Historic Use by Terns?

This input answers the question: “Is this an island that has been used historically as a nesting site by Roseate, Common, or Arctic terns?”

The answer to this question is “yes” if there is any record of one of the three species of terns nesting on the island, including historic and current records. Nesting is defined as the presence of one or more nests, eggs, chicks, or territorial adults. MDIFW’s databases and literature on seabirds nesting in Maine are the reference sources in answering this question.

Habitat Criterion B – Of Management Concern?

This input answers the question: “Is use of the island by terns recent enough for the island to be of management concern to MDIFW?”

The answer is “yes” if nesting terns have been recorded on the island since 1930, the base year for MDIFW’s recovery goal and objectives for the Roseate, Common, and Arctic Terns of if the island is state-owned and has been historically used by terns. Nesting is defined as the presence of one or more nests, eggs, chicks, or territorial adults. MDIFW’s Coastal Islands Databases and historic literature are referenced to answer this question.

Habitat Criterion C – Essential Habitat?

This input answers the question: “Does the site qualify as a candidate Essential Wildlife Habitat for the Roseate Tern?”

The answer is “yes” if one or more pairs of Roseate Terns have nested on the island since 1930, and the island still has suitable habitat as indicated by the presence of nesting common, arctic, or roseate terns in at least any three years since 1976. Nesting is defined as the presence of one or more nests, eggs, chicks, or territorial adults. According to MDIFW’s Coastal Island Database, 23 islands have been used by nesting Roseate Terns since 1930. As of 1991, twenty-two still have suitable habitat and qualify as Essential Habitat.

Habitat Criterion D – Significant Wildlife Habitat?

This input answers the question: “Does the site qualify as a candidate Significant Wildlife Habitat for Nesting Seabirds?”

In 1994, 234 islands were identified, mapped and adopted as Significant Wildlife Habitat under NRPA. Protection guidelines were developed in support of the Natural Resource Protection Act in consultation with the Department of Environmental Protection (DEP).

HABITAT MANAGEMENT OPTIONS

Habitat Management Option I

Include this island on MDIFW's list of tern nesting sites maintained in the Endangered and Threatened Wildlife species files.

These historic records are used to write species assessments, status reports, environmental review and consultation, and serve as the basis for the list of islands to be surveyed annually.

Habitat Management Option II

- 1) Evaluate habitat suitability of islands. Prioritize sites for protection via acquisition, land use planning, conservation easement, voluntary management agreement, landowner notification, or other means.
- 2) Track this island in MDIFW's Coastal Island Database (ICENSUS) and the new ET/SC Database.

Habitat Management Option III

- 1) Develop protection guidelines and review standards for application under “Essential Habitat” (Appendix 6).
- 2) Designate the island Essential Habitat and adopt protection guidelines under the Maine Endangered Species Act, through MDIFW rulemaking.
- 3) Implement the rule.
- 4) Work with the landowner(s) to bring the site under any additional conservation protection as determined through MDIFW’s habitat protection planning.

Habitat Management Option IV

- 1) Develop protection guidelines and review standards for application under Significant Wildlife Habitat and LURC P-FW designation as appropriate.
- 2) Recommend the island and guidelines to DEP for rulemaking under Significant Wildlife Habitat of the Natural Resources Protection Act or to LURC as a P-FW Seabird Nesting Island. Decisions on Significant Wildlife Habitat designation for Common and Arctic Terns will be referred to in the Seabird Nesting Island Management System.
- 3) Implement the rule and protection guidelines.
- 4) Include the island in the notification list to towns for the DECD or other town planning initiatives.

MANAGEMENT SYSTEM OUTPUTS

Management of gulls, predators, and human disturbance and protection of tern nesting islands are essential to the recovery of island nesting terns. Without active management programs, island-nesting tern populations are expected to decline.

Past protection of tern nesting islands has relied upon zoning (P-FW in unorganized towns), acquisition, conservation easements, environmental permit review, and management leases and options. Regulatory authority for habitat management (i.e. designations of Essential Habitat for Roseate Terns and Significant Wildlife Habitat for island nesting seabirds which includes all 3 tern species) is tied to species nesting status and status listings of the species as endangered (from Essential Habitat). These two approaches overlap considerably, but may provide complimentary protection by influencing different activities or unique area designations. Essential Habitat (Appendix 3) offers immediate prohibitions to insure that state and municipal functions do not cause habitat losses which jeopardize recovery of the Roseate Tern from endangered status. Protection of nesting islands via Significant Wildlife Habitat (Appendix 4) and LURC P-FW subdistricts (Appendix 5) mandates permitting of most land uses within mapped habitat under NRPA and designated zones in LURC jurisdiction, thus achieving more comprehensive yet flexible site protection.

Tern nesting island management concerns do not cease with achieving population, productivity, and distribution goals. As long as gull populations remain high they will potentially slow the recovery of island-nesting tern populations. Likewise, development and human disturbance are expected to increase in the future. Long-term recovery and maintenance of large, productive tern colonies will likely depend on human intervention, vigilance, and intensive management of nesting islands.

Therefore, a major emphasis of island-nesting tern management is to promote cooperative management of nesting islands by groups like MDIFW, USFWS, the Canadian Wildlife Service (CWS), NAS, Maine Audubon Society, and other participants in GOMSWG. MDIFW will play a lead role in coordinating, permitting, facilitating, and assisting in these activities and monitoring the success of site management. Zoning of Roseate Tern nesting islands as Essential Habitat insures MDIFW review of environmental permit applications. Case-by-case permitting and customizing management prescriptions to specific nesting islands are accomplished via designations of Significant Wildlife Habitat and LURC P-FW subdistricts. The effectiveness of these measures should be tracked and modified if observed to be either inadequate or excessive.

CHRONOLOGY OF ISLAND-NESTING TERN MANAGEMENT ACTIVITIES

Island-nesting tern population, productivity, distribution and site management decisions are conducted on an annual cycle. An island-nesting tern inventory is conducted annually and provides the basic input to this management system. Population estimates and measures of productivity are made annually on major tern nesting islands. Information updates (mapping, computer, and manual site files) begin immediately with the completion of annual surveys. Environmental permit review occurs year-round.

The GOMSWG serves as a vehicle to exchange information, coordinate management and surveys, and standardize census methodologies. The predecessor to GOMSWG (GOMTWG) published an independent island-nesting tern management plan that is incorporated into several appendices of this document. MDIFW or USFWS generally hosts a pre-season meeting in

Island-nesting Tern Management System

March to coordinate plans for tern surveys and discuss island management. A post-nesting season meeting is held in August (and hosted by NAS) to compile census results and review findings of the effectiveness of management. An annual chronology of management activities is presented in Table 1.

Table 1. Schedule of primary island-nesting tern management activities.

Activity	Start	Finish
Breeding population assessment		
- Nesting inventory	6/12	6/22
- Production survey	6/25	7/31
Gull and predator management		
- Gull poisoning/removal	5/1	7/31
- Limit public/visitor access	5/15	8/15
Tern nesting island management		
- compile inventory data, input site files, and update map locations to Natural Heritage Data Base and Coastal Island Database	8/15	9/15
- Regional summaries of sites and locations	9/15	10/1
- Information outputs for site management (landowners, municipalities, LURC, DEP, DECD, as warranted)	10/1	10/15
- Submit nominations for essential/significant habitat or P-FW designation	10/15	10/30
Coordination		
- Meet with Gulf of Maine Tern Working Group	2/1 8/1	3/31 8/31
- Review site protection priorities within the Wildlife Division	1/1	2/28

PART II: ISLAND-NESTING TERN MANAGEMENT DATABASE

STATEWIDE ISLAND-NESTING TERN SURVEY

Recent statewide censuses of island-nesting terns in Maine were conducted in 1977 by Korschgen (1979) and in 1984 and 1987-91 by members of the Gulf of Maine Tern Working Group (GOMTWG, now referred to as GOMSWG). A statewide census should be conducted annually. A tern nesting island is any island or ledge that has historically supported at least one pair of nesting terns. At least 168 different islands in the Gulf of Maine have been used by nesting terns from the late 1800s. Post-1976 site records and nesting histories of terns breeding in Maine are maintained in MDIFW's Coastal Island Databases, primarily ICENSUS. Much of the pre-1976 historic records of island-nesting terns were compiled by Lovett (1984) and the GOMTWG partners (Drury and Melvin 1990).

During a statewide census, each island historically used by terns should be censused between June 12 and 22. Because of the large geographic region to be covered, census assignments should be designated at the March GOMSWG meeting. Each census should be conducted by estimating the number and species composition of birds flying over the island or systematic nest counts. For colonies over 50 nests, "mark and recapture" estimates are often used to calculate a correction multiplier. Census techniques are standardized by the GOMTWG (Appendix 2). Census data provide input for Criteria A in the decision-making matrix (Figure 1).

MDIFW may serve as census coordinator and compiler and final repository for statewide seabird census data. Census data are submitted only by GOMSWG biologists and cooperators. Census data are screened for accuracy and extend into the database by MDIFW. Roseate Tern census

data are now compiled into ICENSUS and the new ET/SC database. Other GOMSWG partners maintain island nesting seabirds data as well.

All tern survey data are updated annually in ICENSUS. These data are used as input for Criteria B and C in the decision-making matrix and provide baseline information from which to assess changes in population (Figure 1 and 2).

ESTIMATING TERN PRODUCTIVITY

The productivity of most tern nesting islands having >200 pairs are currently surveyed annually by the USFWS (Petit Manan) or National Audubon Society (Matinicus Rock, Eastern Egg Rock, Stratton Island, Seal Island, Pond Island and Outer Green Island.). Researchers estimate productivity by counting chicks on sample plots from a blind or by fencing nests and counting chicks just prior to fledging in July (Appendix 2). Productivity is expressed as “number of young fledged/pair” and is used as an input for Criteria C to assess productivity goals.

COASTAL ISLAND DATABASE

ICENSUS is now maintained the Bird Group at MDIFW’s Bangor office. This database contains information from surveys of nesting populations of 21 species of colonial nesting birds on Maine’s coastal islands. The base year of information entered in the database is 1976 (Pre-1976 nesting information is stored manually in Site Files), the most recent comprehensive, coastwide survey of all islands (Korschgen 1978). New census data are derived annually for

island surveys conducted by MDIFW staff or GOMSWG cooperators. The Coastal Island Registry Number is the unique identifier for each island. There are ancillary, computerized, support files tied into this database containing information on: 1) Coastal island registry number, island name, and registry map number; 2) Species data (common and scientific name and AOU #); and 3) An incomplete file on ownership and geographic descriptor information (town, county, etc.). The completed inventory forms are stored in each island file after the data is entered into ICENSUS. A copy of the Rare Animal Form for tracked species (data repository ET/SC dztabase) is included in Appendix 7.

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- Korschgen, C. E. 1979. Coastal waterbird colonies: Maine. U. S. Fish and Wildlife Service, Biological Services Program. FWS/OBS-79/09. 83pp.

Island-nesting Tern Management System

Maine Department of Inland Fisheries and Wildlife. 1991. Island-nesting tern assessment.

Unpubl. Document, Resource Assessment Section, Bangor, ME. 33pp.

LIST OF APPENDICES

- Appendix 1 Maine State listing of endangered and threatened species, 2006.
- Appendix 2 Standardized methodology for censusing terns and measuring breeding success.
- Appendix 3 Statute that includes the Maine Endangered Species Act, 1973.
- Appendix 4 Reference for the Natural Resources Protection Act of 1988.
- Appendix 5 Reference for Chapter 10, LURC Land Use Districts and Standards
- Appendix 6 Protection guidelines and Species Issue Profile for designating Essential Habitat for Roseate Terns
- Appendix 7 Examples of seabird census field forms and Rare Animal Form for the ET/SC database.

APPENDIX 1

MAINE'S ENDANGERED SPECIES¹

Birds

American Pipit (*Anthus rubescens*) (breeding population only)
Black Tern (*Chlidonias niger*)
Golden Eagle (*Aquila chrysaetos*)
Grasshopper Sparrow (*Ammodramus savannarum*)
Least Bittern (*Ixobrychus exilis*)
Least Tern (*Sterna antillarum*)
Peregrine Falcon (*Falco peregrinus*) (breeding population only)
Piping Plover (*Charadrius melodus*)**
Roseate Tern (*Sterna dougallii*)*
Sedge Wren (*Cistothorus platensis*)

Fish

Redfin Pickerel (*Esox americanus americanus*)

Invertebrates

Butterflies and Skippers

Clayton's Copper (*Lycaena dorcas claytoni*)
Edwards' Hairstreak (*Satyrium edwardsii*)
Hessel's Hairstreak (*Callophrys hesseli*)
Juniper Hairstreak (*Callophrys gryneus*)
Katahdin Arctic (*Oenis polixenes katahdin*)

Dragonflies and Damselflies

Rapids Clubtail (*Gomphus quadricolor*)

Mayflies

Flat-headed mayfly (Roaring Brook mayfly)(*Epeorus frisoni*)

Mammals

New England Cottontail (*Sylvilagus transitionalis*)

Reptiles

Snakes

Black Racer (*Coluber constrictor*)

Turtles

Blanding's Turtle (*Emydoidea blandingii*)
Box Turtle (*Terrapene carolina*)

1. Species listed through the Maine Department of Inland Fisheries and Wildlife under Title 12 § 12803. Marine species listed separately through the Maine Department of Marine Resources under Title 12 § 6975, and federally listed species not listed under Maine's Endangered Species Act, are not included in this list.

* Federally listed as Endangered

** Federally listed as Threatened

MAINE'S THREATENED SPECIES¹

September 20, 2007

Birds

Arctic Tern (*Sterna paradisaea*)
Atlantic Puffin (*Fratercula arctica*)
Bald Eagle (*Haliaeetus leucocephalus*)
Barrow's Goldeneye (*Bucephala islandica*)
Black-crowned Night Heron (*Nycticorax nycticorax*)
Common Moorhen (*Gallinula chloropus*)
Great Cormorant (*Phalacrocorax carbo*) (Breeding population only)
Harlequin Duck (*Histrionicus histrionicus*)
Razorbill (*Alca torda*)
Upland Sandpiper (*Bartramia longicauda*)
Short-eared Owl (*Asio flammeus*) (Breeding population only)

Fish

Swamp Darter (*Etheostoma fusiforme*)

Invertebrates

Butterflies and Skippers

Purple Lesser Fritillary (*Boloria chariclea grandis*)

Sleepy Duskywing (*Erynnis brizo*)

Moths

Pine Barrens Zanclognatha (*Zanclognatha martha*)

Twilight Moth (*Lucia rachelae*)

Dragonflies and Damselflies

Boreal Snaketail (*Ophiogomphus colubrinus*)

Ringed Boghaunter (*Williamsonia lintneri*)

Freshwater Mussels

Brook Floater (*Alasmidonta varicosa*)

Tidewater Mucket (*Leptodea ochracea*)

Yellow Lampmussel (*Lampsilis cariosa*)

Mayflies

Tomah Mayfly (*Siphonisca aerodromia*)

Mammals

Northern Bog Lemming (*Synaptomys borealis*)

Reptiles

Turtles

Spotted Turtle (*Clemmys guttata*)

Island-nesting Tern Management System

- 1 Species listed through the Maine Department of Inland Fisheries and Wildlife under Title 12 § 12803. Marine species listed separately through the Maine Department of Marine Resources under Title 12 § 6975, and federally listed species not listed under Maine's Endangered Species Act, are not included in this list.
- * Federally listed as Endangered
 - ** Federally listed as Threatened (*longicauda*)

APPENDIX 2

SUGGESTIONS FOR FIELD CREWS

STANDARDIZED TECHNIQUES FOR CENSUSING AND MEASURING BREEDING SUCCESS

The Management System has objectives to annually measure the abundance, distribution, and productivity of Common, Arctic, and Roseate Tern Colonies. The following census guidelines were originally developed by GOMTWG and modified for MDIFW's Management System.

Census Methods

Unless observers intend to make repeated visits to individually marked nests, they should make only one, careful complete count. Subsequent counts may confuse the issue as during the course of the season, some pairs abandon when their nests fail. In addition:

- a. new nests will appear belong to inexperienced birds breeding for the first time, and
- b. if the tern colony has been disturbed, renesting may appear through most of June and into July. If the new nests are counted as they appear, they will tally up to a very impressive, but not very helpful total.

Suggested Procedures for Counting Nests

1. Estimate the numbers of birds flying over the nesting area (see techniques proposed below) and conduct a complete nest count.
2. Nest counts are best made by at least two people walking abreast at arms length systematically making swaths through the nesting area. Plan routes ahead of time so that you avoid duplication and gaps. The census team should make as many passes as necessary to cover all nesting habitat completely. One person should record data while the others count. Avoid making counts on rainy or cold days, which would have negative effects on nesting success.
3. Make counts just before eggs hatch, during a period between June 12 and 22. Counts conducted after this period are likely to be inflated. If birds start at one island, but are disturbed, they may move to another in late June (as they apparently did at Metinic in 1987 and Large Green in 1988).

4. For colonies over 50 nests, conduct a “mark and recapture” sample of the nests. The technique adds only a little extra work, and can provide a check on the accuracy of both the nest counts and the estimates of birds in the air.

Mark each nest as it is counted (to avoid counting a nest more than once). Use substantial markers, like tongue depressors or flower pot markers. Don't worry about possible subtle effects of having your eye drawn to marked nests, and do worry about putting small objects in the nests as markers. Terns will remove some “foreign objects”, such as your inconspicuous markers, and you will get an inflated count.

After you have completed a count-and-mark survey, search a swath or transect running diagonally across the nesting area, recording the number of nests found marked and the number found unmarked (missing in the first search). Use these numbers to calculate an index for the total number of nests, called a Peterson or Lincoln index, as follows:

Say you found 86 nests on the main search, and 18 marked nests and 4 unmarked on the transect. Divide 22 (the total) by 18 (the number marked); this gives you 1.2. Multiply 86 by 1.2 giving the index total of 103. Remember that because you missed some, the correction is upwards and the correct multiplier will be more than 1.

Estimated Reproductive Success

Nisbet and Drury (1972). “Measuring Breeding Success in Common and Roseate Terns.” *Bird Banding* 43 (2):97-106 found that the number of chicks per nest could be determined by:

- a. Putting up a blind and counting the chicks visible at each of several samples of nests.
- b. Setting up fences around several samples of about twenty nests each, marking and counting the nests within the fences and later banding chicks, or
 - a. USING BLINDS – Good data on reproductive success can be obtained with relatively little disturbance, by setting up a blind at each of several places from which 10-20 nests can be seen clearly. Nests can be marked with tall stakes during the incubation stage and then each nest site repeatedly check from the blind for the number of chicks loitering at it. Twenty to forty well-monitored nests will give good data on chicks produced per nest.
 - b. USING FENCED PLOTS – Fence selected areas; count and mark the nests. When the eggs have hatched search the area very carefully, banding chicks (record the band numbers). A couple of days later repeat the search, recording band-numbers of all banded chicks and band and record any chicks found unbanded. Again a “Peterson/Lincoln Index” gives a total of the chicks surviving to the time of the first banding trip.

Comments

Fences can be constructed prior to nesting if one knows the general location that terns will nest. Otherwise, set up fences after incubation has begun. Make sure that the wire mesh will not allow a chick to get part way through and not be able to get back. Be sure that the bottom of the fence is free of places for tiny chicks to slip through and not be able to get back. The parents may not have sense enough to feed them outside the fence. Avoid having the fences run through dense vegetation, because chicks press themselves under the “thatch”. These chicks are very hard to find and it is distressing to step on one that you haven’t seen.

Another more detailed body of information can be got by marking chicks as they hatch (banding or putting a small, biodegradable tag on one wing and banding them later). Then at regular intervals (twice weekly is adequate) weigh and measure the chicks – the length of the “hand-plus-primary-feathers”. These measurements give a growth-rate, which provides a high-grade measure of quality of the local feeding grounds – or the parents’ competence.

We need to have banded, known-aged adults for this study.

Censusing the Many Islands not Subject to Detailed Studies

In any year in which we run a coastwide census, we must estimate numbers on all occupied islands to follow trends in the tern population, because the birds move around so much. As shown by models tested by biometrician William Bossert of Harvard, we can use data with as much as 30% “error” to identify population trends over several decades. We can gather data comparable in accuracy to nest counts by making careful estimates of the numbers of birds flying up over a nesting area.

Estimating the numbers of birds in the air over a nesting area is the most practical way of keeping track of numbers over a large portion of the coast. Observers should record the details of their methods.

Estimating the Number of Birds over a Ternery

In mid-June, (when most of the birds are incubating), observers should go in to the nesting area as soon as they land, and put the birds up; almost all will fly up. Once they are up, set about estimating the numbers of birds flying carefully and quickly, counting by groups of “tens” or “fifties”. It is important to avoid dallying, because those that go up soon begin to settle and drift away. Don’t let someone distract you by calling your attention to some rare species.

You should estimate the numbers of birds loafing in flocks on the shore separately. These are non-breeders and failed breeders.

Observers should test themselves to establish whether their estimates of birds in the air are equal to the number of nests, higher or lower – and by how much. Observers can calibrate their estimates by comparing the percentage of the air estimates with the estimates of nests on the island. It is also helpful to spread differing numbers of grains of rice on a black piece of paper and “fix” the number (gestalt) in your mind’s eye. Many people can learn this trade easily while others can’t.

Experience, which is primarily paying attention, and practice will help to refine accuracy and consistency. Most important, consider what it is that you are trying to learn and what level of precision is necessary to learn that. The difference between 15 and 25 is important, but that between 75 and 95 is much less important, as is the difference between 650 and 675. that is one meaning of logarithmic function.

A quick way to measure breeding success requires two visits, one in mid-June to estimate birds over the nesting area (approximate number of nests), and one in late July to see whether the terns are still present and to count fledging chicks. Chicks gather at the shore soon after fledging. The number of terns over the island on the second visit reflect the number of pairs that have chicks, as failed birds leave.

These data allow you to estimate whether the breeding season was a disaster (no chicks), poor (maybe 10-20% success), or good. This is useful, because breeding attempts at most unsupervised islands in Maine have run from 9 to 20% success.

Tern Management

The following management activities are intended to improve conditions for successful breeding at the colonies chosen for intensive management.

1. Breaking eggs and shooting generally will not be effective in driving gulls from a nesting island once they have bred there for several years. This depends on the size of the island and number of pairs of gulls. Larger islands with large gull populations may require 3 treatments/year for several consecutive years. Small islands with less than 50 pairs of gulls may require only a single treatment. Managers must poison adults and if gulls are to be poisoned, they should not be disturbed beforehand.

Remove nesting Herring and Great Black-backed Gulls from the island by poisoning using the avicide DRC 1339. Success may require 2 poisonings per year for two years.

Support the poisoning program by shooting adults and breaking eggs in nests found after the poisoning to prevent resettling.

As many as 3 excursions per week may be needed during nesting season to shoot gulls and break eggs.

2. Remove any mammalian predators such as rats and feral cats. If mink repeatedly gain access to the island, the island may not be suitable for management.
3. Maintain a field crew camping on the island wherever possible and post the nesting area to limit visitor access. No access for visitors with dogs even on a leash can be allowed during the nesting season, May 15 to August 15. Other visitors must be supervised and stay on marked access routes.
4. If the island has been overgrown by bushes (Bayberry, Cherry, and Raspberry) or grass, it may be necessary to mow, burn repeatedly and apply herbicides to create openings. Chicks

need some cover for shelter from sun and rain, but no shelter will provide protection from predation.

5. Use of decoys and recordings of calls has been successful in attracting terns to empty islands, but these are probably superfluous where a few terns have settled.
6. For the long term, it will be helpful to take political action to keep “second-home” housing development off existing or potential tern nesting islands. This involves seeing that all tern-nesting islands receive special consideration during the environmental reviews by state agencies such as the Department of Environmental Protection (DEP) and the Department of Inland Fisheries and Wildlife (DIFW). Citizens can insure that local municipal governments and planning boards are aware of the nesting sites of seabirds and waterfowl within their jurisdiction.
7. The most effective protection is provided by owning or obtaining conservation easements or management agreements for nesting islands.

APPENDIX 3

STATE OF MAINE
INLAND FISHERIES AND
WILDLIFE LAWS

12 MRSA PART 10
CHAPTERS 701-721
AS ENACTED BY PUBLIC LAW,
CHAPTER 420, SECTION 1
AND AS AMENDED

[EFFECTIVE SEPTEMBER 30, 1989
UNLESS OTHERWISE NOTED]

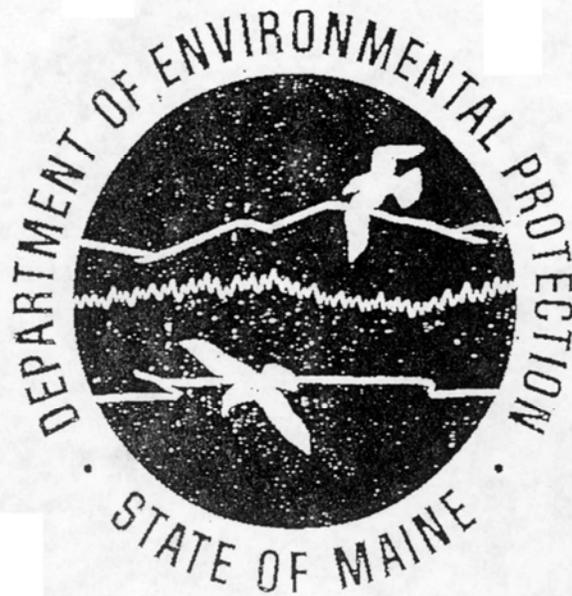
APPENDIX 4

STATE OF MAINE

DEPARTMENT OF ENVIRONMENTAL PROTECTION

NATURAL RESOURCES PROTECTION ACT

TITLE 38 M.R.S.A. SECTIONS 480-A THROUGH 480-S



THIS PACKET CONTAINS
STATUTE AND APPLICATION FORM

STATUTE:

EFFECTIVE DATE: AUGUST 4, 1988

REVISED: SEPTEMBER 30, 1989

APPLICATION:

REVISED: SEPTEMBER 30, 1989

APPENDIX 5



Land Use Districts and Standards

For Areas Within the
Jurisdiction of the
Maine Land Use
Regulation Commission

Chapter 10 of the Commission's Rules and Standards

Initially Adopted January 12, 1977
Latest Revision August 15, 1991

Land Use Regulation Commission
MAINE DEPARTMENT OF CONSERVATION

APPENDIX 6

STATE OF MAINE
INLAND FISHERIES AND WILDLIFE RULES

Chapter 8.03 Essential Habitat for Species Designated as Endangered or Threatened.

B. Roseate Tern Nesting Area

1. Purpose

To provide special protection to maintain breeding habitat and to prevent disturbance which may cause nesting failure of roseate terns. Protection is focused on the nesting area.

2. Definitions

When used in this section, the following words and terms shall have the following meaning:

- a. **Nesting area.** "Nesting area" means a locality encompassing an island or portion of an island used by at least one pair of nesting roseate terns.
- b. **Nesting.** "Nesting" means the presence of one or more nests, eggs, chicks, or pairs of territorial adult terns between May 15 - August 15.
- c. **Project.** "Project" means a planned undertaking, newly initiated or reinitiated.

3. Designation Criteria

Roseate tern nesting areas identified and mapped by the Commissioner of Inland Fisheries and Wildlife as Essential Habitat must:

- a. Have a record of at least one pair of nesting roseate terns since 1930,
- b. Have suitable habitat as indicated by the presence of nesting common, arctic, or roseate terns in at least any 3 years since 1976, and
- c. Be considered essential to the achievement of the Department's management goals and objectives for roseate terns.

Roseate tern nesting areas designated as Essential Habitat will be deleted if:

- a. The nesting area has not been occupied by any nesting pairs of common terns, arctic terns, or roseate terns during the most recent 10 years, and the lack of occupancy is not related to predation or competition from other species, or to any human-related activity, or
- b. The nesting area is no longer considered essential to the achievement of the Department's management goals and objectives for roseate terns.

4. Protection Guidelines

- a. **Projects Prohibited Without the Commissioner's Approval**

Any project requiring a permit or license from, or to be funded or carried out by, a state agency or municipal government partly or wholly within a roseate tern nesting area designated as Essential Habitat shall not be permitted, licensed, funded, or carried out unless the Commissioner determines that the activity will not significantly alter or unreasonably harm the Essential Habitat. Projects that may be affected include, but are not limited to: Subdivision of land or buildings; construction, installation, expansion, alteration or repair of permanent structures; agricultural management; mineral exploration and extraction; forest management; road projects and construction; shoreland alteration; utility construction; water crossing; water impoundment; dredging; aquaculture; conversion of seasonal dwelling; installation of subsurface wastewater disposal system; and issuance of an exemption of the minimum lot size requirement.

- b. **Exemptions**

The following activities are exempted from the requirements of this paragraph.

- 1) Projects limited to repairs, maintenance and alterations to the interior of an existing structure.
- 2) Emergency repairs to existing structures and utilities which due to unforeseen circumstances require immediate action.

- 3) Emergency activities which due to unforeseen circumstances require immediate action for public health or safety.
- 4) Licenses and permits to operate or occupy a completed project.
- 5) Projects that address the protection of the Essential Habitat and the Endangered and Threatened Species and are conducted as part of a Department Wildlife Management Area Plan or Species Management Plan, or a Land Use Regulation Commission Resource Protection Plan (P-RP) to which the Department is a party, provided that the parties of the agreement perform according to its terms.

5. Significant Alteration of Habitat

In determining whether a project significantly alters or unreasonably harms essential nesting habitat, the following factors will be considered:

- a. Magnitude and time of year of noise and human activity generated by the project.
- b. Physical alteration to the landscape of the uplands, waters, and submerged lands.
- c. Destruction of or alteration to key habitat components such as island vegetation, nesting and roosting substrate, and foraging areas.
- d. Increase in disturbance by humans, and in predation or competition by other species.
- e. Demonstrated tolerance of terns at the site to human activity and disturbance.
- f. Reduction in the future suitability of the nesting area to nesting roseate terns.

AUTHORITY: Sections 7035 and 7754

Effective Date:



ISSUE PROFILE

ESSENTIAL HABITAT: ROSEATE TERN NESTING ISLANDS

December 1992

BACKGROUND

Maine's fish and wildlife are a valuable public resource, yet some species are in danger of becoming extinct within the State. The Legislature recognized this by passing the Maine Endangered Species Act in 1975 (MRSA Title 12, chapter 713, subchapter V).

In 1988, the Legislature amended the Act by adding habitat protection provisions in recognition of two issues: 1) the effect habitat loss has on endangered and threatened species in Maine; and 2) the confusion and sometimes costly problems that arise in the absence of consistent, predictable land use decision-making processes for endangered and threatened species. As a result, the Commissioner of the Maine Department of Inland Fisheries and Wildlife (MDIFW) is now authorized to designate areas as "Essential Habitat" and to develop protection guidelines and review standards for these Essential Habitats.

WHAT ARE ESSENTIAL HABITATS?

Essential Habitats are areas currently or historically providing physical or biological features essential to the conservation of an endangered or threatened species in Maine and which may require special management considerations. Essential Habitats must be identified and mapped by MDIFW. Examples of areas that could qualify for designation are nest sites or important feeding areas. For some species, protection of these kinds of habitats is vital to preventing further declines or achieving recovery goals.

WHY DOES THE ROSEATE TERN NEED THIS LEVEL OF PROTECTION?

Roseate terns are small, graceful seabirds that return each spring to nest and raise their young on a few traditionally used islands along the eastern coast of North America. Although exact historic figures are unknown, it is likely that several hundred pairs once nested in Maine. During the late 1800s, however, roseate tern numbers declined drastically as human-related habitat degradation and unrestricted shooting nearly eliminated the species throughout its range.

Around the turn of the century, state and federal laws were passed to prohibit indiscriminate killing of terns and other migratory birds. At the same time, human influences on coastal islands were decreasing. As a result, roseate tern numbers increased. By the early 1930s, Maine's population had grown to about 275 pairs. Unfortunately, this recovery was not to last. Renewed pressures from habitat loss and human disturbance, combined with predation and competition from a growing gull population, initiated a second decline. By 1987, as few as 52 pairs of roseate terns nested in Maine.

In 1986, the roseate tern was listed as an endangered species under both the United States and Maine Endangered Species Acts. As a result of intensive management efforts, Maine's population has grown to approximately 125 pairs. Roseate terns in Maine nest on just a small handful of islands. After more than 100 years of record-keeping, they have been found on only 21 of the more than 3,500 islands off our coast. These few islands, providing the unique combination of features necessary for successful nesting, are essential to the restoration of roseate terns in Maine. Disturbances or land use changes at these

traditional sites can cause nesting failure and consequently prevent the overall population from maintaining its numbers or increasing to recovery levels. For this reason, they are the focus of Essential Habitat designation for roseate terns.

WHAT DOES ESSENTIAL HABITAT DESIGNATION MEAN TO A LANDOWNER?

Activities of private landowners are not affected by Essential Habitat designation unless projects require a permit or license from, or are funded or carried out by, a state agency or municipality. In these cases, MDIFW must review and give approval before project activities can take place. No new permits or fees required. Designation simply establishes a standardized review process within existing state and municipal permitting processes. It ensures landowners of consistent reviews on land use permit applications where endangered and threatened species are involved, and eliminates the confusion, delays, and sometimes costly problems that can arise in the absence of standardized, predictable decision-making.

When projects are proposed within Essential Habitats, landowners should initiate early consultations with the appropriate MDIFW Regional Wildlife Biologist so that concerns for endangered and threatened species can be incorporated into preliminary project planning and design. MDIFW also offers technical assistance to property owners who wish to manage their lands to enhance wildlife habitat.

WHAT DOES ESSENTIAL HABITAT DESIGNATION MEAN TO STATE AGENCIES AND MUNICIPALITIES?

State agencies and municipalities cannot permit, license, fund, or carry out projects within areas designated as Essential Habitat without approval from MDIFW. Early consultations with MDIFW Regional Wildlife Biologists will facilitate identification of incompatible projects or appropriate modifications to proposals within an Essential Habitat. Concerns for endangered and threatened species should be addressed during preliminary planning and existing agency or municipal review procedures and before seeking MDIFW final approval. Failure to do so may result in unnecessary conflicts, delays, or project denials during MDIFW reviews. MDIFW also offers guidance to municipalities when concerns for endangered and threatened species and other wildlife are being addressed in comprehensive plans and town ordinances.

WHAT TYPES OF PROJECTS REQUIRE MDIFW REVIEW AND APPROVAL?

According to the Maine Endangered Species Act, any project that is wholly or partly within an Essential Habitat and is permitted, licensed, funded, or carried out by a state agency or municipal government, requires approval from the Commissioner of MDIFW. Some examples of projects that require MDIFW review and approval are those involving:

- subdivision of land
- construction or alteration of buildings, waste-water systems, or utilities
- conversion of seasonal dwellings to year round
- exemption to minimum lot size requirements
- construction or relocation of roads
- exploration or extraction of minerals
- alteration to wetlands, submerged bottomlands, or shoreland zones
- installation of docks, moorings, or aquaculture facilities

Landowners, project planners, municipalities or state agencies considering a project proposal in or near an Essential Habitat should immediately contact an MDIFW Regional Wildlife Biologist for assistance. Early consultations will help to resolve avoidable conflicts and prevent unnecessary delays, frustrations, and economic pitfalls that might otherwise arise during the final project review.

ARE THERE PROJECTS EXEMPT FROM REVIEW?

Yes. The following are examples of projects which are exempt from review:

- emergency repairs to existing structures and utilities
- emergency activities necessary for public health and safety
- interior repairs and construction
- any project not carried out by, funded by, or requiring a permit or license from a state agency or municipality

WHAT ARE THE REVIEW STANDARDS FOR PROJECTS WITHIN ESSENTIAL HABITATS?

Projects must not significantly alter or unreasonably harm an Essential Habitat. If they do, projects may be denied by MDIFW. The following factors are considered when reviewing a project proposal to determine if significant alteration of habitat or unreasonable harm will occur at roseate tern nesting areas:

- seasonal timing of project
- noise and human activity generated by project before, during, or after completion
- physical alteration to uplands, waters, or submerged lands
- impact on key habitat components such as island vegetation, nesting and roosting substrate, and foraging areas
- increase in human disturbance, predation, or competition with other species
- demonstrated tolerance of terns at the site to human activity and disturbance
- reduction in the future suitability of the nesting area for roseate terns

IS THE SEASONAL TIMING OF PROJECTS A MAJOR CONCERN?

Yes! Roseate terns are very sensitive to disturbance during their nesting season. Generally, this is between May 15 and August 31 but may vary slightly from year to year. Seasonal timing of activities will often be a determining factor in project reviews and should always be addressed in a project's design before seeking final MDIFW evaluation. Contact an MDIFW Regional Wildlife Biologist for assistance in determining seasonal timing concerns. Examples of projects often acceptable outside of the critical nesting season are:

- expansion, alteration, or repair of existing structures
- construction, if all other review standards are met

ONCE AN AREA IS DESIGNATED AS ESSENTIAL HABITAT, WILL IT ALWAYS BE SO?

No. The law allows Essential Habitat designation only for Endangered and Threatened Species. Designating roseate tern nesting islands as Essential Habitat will allow Maine's roseate tern population to grow. If the species recovers to the point where it is no longer endangered or threatened, all Essential Habitat designations for roseate terns will be eliminated. Also, if a nesting area is no longer considered essential to achieving recovery goals for roseate terns, Essential Habitat designation would be removed.

WHO CAN YOU CONTACT FOR MORE INFORMATION?

The Maine Department of Inland Fisheries and Wildlife. There are seven regional offices to assist you. Please contact a Regional Wildlife Biologist at the nearest regional headquarters.

Gray: 358 Shaker Rd., Gray, ME 04039
phone: (207) 657-2345

Sidney: 270 Lyons Rd., Sidney, ME 04330
phone: (207) 547-5318

Jonesboro: P.O. Box 220, Jonesboro, ME 04648-0220
phone: (207) 434-5927

Strong: 689 Farmington Rd., Strong, ME 04983
phone: (207) 778-3324

Greenville: P.O. Box 551, Greenville, ME 04441-0551
phone: (207) 695-3756

Enfield: 73 Cobb Road, Enfield, ME 04493
phone: (207) 732-4132

Ashland: P.O. Box 447, Ashland, ME 04732-0447
phone: (207) 435-3231

APPENDIX 7

Key to Abbreviations for Census Methods

AVE Aerial Visual Estimate

BE Boat Visual Estimate

CNC Complete Nest Count

FC Flush Count

PC Photo Count

PNC Partial Nest Count

TAC Total Adults On-Site Count

VE Visual Estimate

MAINE DEPARTMENT OF INLAND FISHERIES AND WILDLIFE
 COLONIAL-NESTING SEABIRD UPDATE
 1976-1985

Date: 07/14/87

Colony No. ¹ Year	Island No. ² Date	Island Name Species	NstPrs ³	Method ⁴	TotalPop ⁵	Method
000 001	59137	CONARY'S NUB I				
1984	7/03	Common Tern	146	CNC	80 ⁶	FC
	6/07	Unidentified Terns	-0-	-0-	8888	AVE
1985	6/26	Common Tern	65	CNC	65	VE
	7/28	Common Tern	8888	-0-	7	VE
000 002	73178	HEN I				
1980	6/16	Common Tern	10	CNC	20	VE
1984	7/06	Common Tern	44	VE	100	VE
	6/08	Unidentified Terns	-0-	-0-	8888	AVE
1985	7/27	Common Tern	41	CNC	68	VE
000 003	0055A	ELM LDG				
1980	6/16	Great Black-backed Gull	5	CNC	-0-	-0-
	6/16	Herring Gull	9	CNC	-0-	-0-

¹USFWS colony number; numbers prefixed by "000" are temporary codes assigned by Maine Inland Fish and Wildlife

²Coastal Island Registry number; numbers prefixed by "00" are temporary codes assigned by Maine Inland Fish and Wildlife

³nesting pairs

⁴see attached key to method abbreviations

⁵total population

⁶no estimate

⁷unknown date value

rev. 12/15/2005

RARE ANIMAL SURVEY FORM

Page 1
MDIFW
650 State St.
Bangor, ME 04401

Reviewed by MDIFW Date: _____ Initials: _____

INSTRUCTIONS: Complete 1 form per visit. Grayed sections are for Heritage office use only.

SURVEYSITE:	TOWNSHIP:
NEW EO (check): _____ UPDATE (check): _____ (EO NUM: _____)	DELORME PAGE & GRID (e.g. 04B2):
FILE QUADCODE:	FILE QUADNAME:

ELEMENT INFORMATION

Common Name:	Scientific Name:
--------------	------------------

SURVEYOR INFORMATION

Survey date: ____ - ____ - ____ (yyyy - mm - dd)	Time from: _____ to: _____ am or pm	Sourcecode: F _____
Surveyors (principal surveyor first, include first & last name): _____		
Weather conditions: _____		
Revisit to this occurrence needed? <input type="checkbox"/> yes <input type="checkbox"/> no Why?: _____		

IDENTIFICATION

Photograph/slide taken? <input type="checkbox"/> yes <input type="checkbox"/> no	Notes & repository: _____
Specimen collected? <input type="checkbox"/> yes <input type="checkbox"/> no	Specimen # and repository: _____
Identification problems? <input type="checkbox"/> yes <input type="checkbox"/> no	Explain: _____

ELEMENT OCCURRENCE INFORMATION

- Type of Observation: sight vocalization handled collected other (explain): _____
- Observed Abundance (incl. age and sex): _____
- Estimated Abundance (and basis for estimate): _____
- Evidence of Reproduction and/or Other Behaviors: _____
- Misc. Notes: _____

LOCATION

GPS Source Data 1 (NAD ____): _____ (UTM or Lat/Long) ACCURACY: _____

GPS FEATURE NOTES: _____

GPS Source Data 2 (NAD ____): _____ (UTM or Lat/Long) ACCURACY: _____

GPS FEATURE NOTES: _____

DIRECTIONS: Provide detailed directions to this element occurrence (versus the survey site) using a readily locatable and relatively permanent landmark as a starting point. Refer to nearby landmarks, roads and villages. Include distances, compass directions (North, South etc.).

OWNER: (If known, indicate name of owner(s), address and phone number) _____

HABITAT DESCRIPTION: Describe the specific habitat or micro-habitats where this animal occurs. Convey a mental image of the habitat and its features including: land forms, aquatic features, vegetation, slope, aspect, soils, associated plant and animal species, natural disturbances.

THREATS AND/OR MANAGEMENT CONCERNS: _____

EO RANKING

1. SIZE / QUALITY:

How large is this population relative to typical populations of the species? Does it appear to be viable, i.e. capable of maintaining itself if its habitat remains basically intact?

- **Size / Quality Rank:** **A** excellent **B** good **C** fair **D** poor **U** unknown
- **Explain Basis:**

2. CURRENT CONDITION of the animal habitat:

Note any natural and anthropogenic disturbance within the animal habitat (check off, then describe extent and how recent below):

- | | |
|-------------------------------------------------------------------|----------------------------------------------------|
| <input type="checkbox"/> Logging – most recently c. _____ yrs ago | <input type="checkbox"/> Partial Development |
| <input type="checkbox"/> Agriculture / pasture | <input type="checkbox"/> Erosion |
| <input type="checkbox"/> Fire | <input type="checkbox"/> Dumping or Mining |
| <input type="checkbox"/> Wind or ice damage | <input type="checkbox"/> ORV / vehicle disturbance |
| <input type="checkbox"/> Impoundment | <input type="checkbox"/> Trails / roads |
| <input type="checkbox"/> Exotic plants | <input type="checkbox"/> Other |

Describe the disturbance(s): to what degree have these altered natural processes, or had negative or positive effects on the population?

• **Condition Rank:**

- 1 No signs of human disturbance (human use may have occurred, but long enough ago that effects are no longer visible or are extremely minor).
- 2 Some signs of human disturbance or degradation, but habitat generally intact.
- 3 Highly disturbed.

3. LANDSCAPE CONTEXT of the area surrounding the animal habitat:

What land uses and/or natural communities surround the observed area? To what degree can the population be protected from effects of adjacent land uses?

• **Landscape Rank:**

- Population surrounded by >= 1000 acres of undisturbed landscape.
- Population surrounded by fairly intact landscape, though there may be cuts nearby.
- Population surrounded by fragmented forest or rural landscape.
- Surrounding area developed.

4. OVERALL RANK for EO based on your experience: **A** excellent **B** good **C** fair **D** poor **E** extant **H** historical

5. MDIFW reviewed/verified rank: **A** excellent **B** good **C** fair **D** poor **E** extant **H** historical

Describe rationale (consult global EO rank specifications and/or explain statewide ranking criteria of your own):
