USA: Maine: Multi-species Seabird Colony Restoration

Overview

Nesting herring and great black-backed gulls (Larus argentatus and Larus marinus) were removed from a recently abandoned tern (Sterna sp.) colony through a combination of poisoning and shooting. Following gull control, all three species of tern that had nested in the colony prior to the arrival of the gulls returned and nested in increasing numbers. In addition to the restoration of the terns, removal of the gulls led to colonization and/or significant increases in populations of four other seabirds. Gull numbers were greatly reduced by initial poisoning efforts, but continued immigration from surrounding colonies has required an on-going program of shooting to eliminate territorial birds nesting in areas utilized by terns and other species. In situations calling for active management it is reasonable to advocate rapid, focused intervention, and stress the importance of inter-organizational cooperation, and an active program of public education.

Project Details

Lead entity types:

- Other

Adaptive management

Describe adaptive management processes and mid-course corrections taken to address unforeseen challenges and improve outcomes in each of the following categories:

State of Progress:

- Closed/completed, no further follow-up

Project Start:

1984-01-01

Project End:

1996-12-31

Global Regions:

- Northern America
- Americas
- World

Countries:

- United States of America

Ecosystem Functional Groups / Biomes:

- Shorelines biome

Extent of project:

- Other

Extent of restoration:

- Other

Degradations:

- Invasive species
- Other

Description:

In the late 19th century a combination of hunting pressure and extensive use of coastal and outer islands by fisher-folk led to the almost complete disappearance of most seabirds including gulls and terns. Changes in land-use practices and the elimination of plume hunting resulting in a widespread recovery of most species that lasted into the mid-1940s. By the 1950s it was apparent that populations of the herring gull and the great black-backed gull had continued to expand, populations of other seabirds were once more in decline. The suspected primary cause of

the decline was predation and/or territorial behavior by the large larids. The population of herring and great black-backed gulls was supported by the presence of large open landfills along the entire New England coast as well as the disposal of fisheries by-catch. By the 1960s the bulk of the remaining arctic, common and roseate terns were concentrated on islands containing manned light-stations. Coast Guard personnel, concerned about he impact of bird droppings on their water sources, tended to shoot or otherwise discourage herring and great black-backed gulls from nesting on with light-stations. Terns and other seabirds, which were likely to roots near human-occupied structures, were largely ignored, with the result that the lighthouse islands became de facto refuges. Automation of the light stations in the 1960s and early 1970s was followed by the colonization of the lighthouse islands by large gulls and the collapse of tern colonies.

Planning and Review

Goals and Objectives

Was a baseline assessment conducted:

unsure

Was a reference model used:

RM5

were_goals_identified:

YES

Goals and objectives:

- Other

Goals Description::

The impact of increasing number of large gulls, particularly herring gulls, and greater black backed gulls has been of concern in Britain, Europe, and the eastern United States for much of the latter part of this century. Gulls have been implicated in the spread of disease, collisions with aircraft, and predation on other species of waterfowl. In the present project, it is this latter effect and its remediation that was most relevant.

Stakeholder Engagement

Were Stakeholders engaged?:

unsure

Description of Stakeholder Involvement:

Discussion among private, federal and state organizations during the 1970s and early 1980s led to a general agreement on the need to reestablish populations of terns and other seabirds at a variety of sites along the north-eastern seaboard of the United States. Following an initial success, gull removal programs have been initiated on nine islands in the Gulf of Maine. This project evaluated the effect of gull control on an island cooperatively managed by the US Fish and Wildlife Service and the Island Research Center at the College of the Atlantic in the state of Maine. Results from this island are compared to changes in nesting numbers on other seabird nesting islands in the Gulf of Maine.

Ecosystem Activities and Approaches

General Activities: In 1984 the US Fish and Wildlife Service initiated a gull-control program. The avicide DRC1339 was placed in gull nests on both Petit Manan and Green Islands. Poisoning on Petit Manan ceased after 1984; however it continued yearly on Green Island through 1987 and a final poisoning was conducted on Green Island in 1990. No further management activity has been conducted on Green Island except for periodic censusing. Every year, since 1985, one to four pairs of herring or great black-backed gull pairs have attempted to nest on Petit Manan. Birds attempting to nest or seen actively harassing terns, black guillemots (Cepphus grylle) or laughing gulls (Larus atricilla) have been killed with a 0.22 rifle. Gulls loafng on the lower intertidal of Petit Manan have been left undisturbed. Since 1985 Petit Manan Island has been searched thoroughly for nesting terns during the peak laying time period. The search is conducted by four to six researchers walking in line at arms' length apart. Each nest is marked with a numbered 10 cm wooden stake. At the conclusion of the count, one researcher walks back through the colony in a zigzag pattern at right angles to the route of the original count. This individual records the number of marked and unmarked nests encountered. The resulting ratio (typically between 0.05 and 0.07) is applied to the initial total as a `correction factor' for missed nests. Laughing gulls have nested on Petit Manan at least since the early 1960s. Prior to 1989, counts of laughing gulls consisted of transects taken through

areas of presumed maximal density, with extrapolations providing an estimate for the island as a whole. Since 1989, all areas of the island have been searched for nests. With the exception of six black guillemot nests located in 1995, Green Island has only provided nesting sites for common eiders (Somateria mollissima), herring gulls and great black-backed gulls. Data for eiders on the two islands has traditionally been combined in reports, but the majority of eiders seem to have always nested on Green Island. Common eider duck nests were counted on Petit Manan Island in mid-June as part of the laughing gull census. Green Island was censused in late May approximately every 3 years. Total nests are reported as the sum of the number of nests found on both islands. Nesting burrows of black guillemots and Atlantic puffins (Fratercula arctica) were located through intensive searches of the rocky berm surrounding the island. The number of herring and great black-backed gulls nesting on Petit Manan and Green Islands was recorded in the course of poisoning sweeps and/or censuses of each island in late May or early June. Comparative data of seabird colonies on other islands in the Gulf of Maine were obtained from Erwin and Korschgen (1979) and the State of Maine Department of Inland Fisheries and Wildlife.

Project Outcomes

Eliminate existing threats to the ecosystem: Gull control has been used as a management technique on many seabird colonies on both sides of the Atlantic. On Petit Manan Island the initial applications of DRC1339 in 1984 coupled with an on-going human presence each summer has essentially eliminated nesting herring and great black-backed gulls. Gull control on nearby Green Island has stabilized the number of nesting gulls but has failed to rid the island of a base population of approximately 120Â±150 pairs. During years in which active gull control occurred on Green Island very few gull chicks fledged, thus the continued settlement of gulls on Green Island and the limited nesting attempts on Petit Manan must be due to immigration from other colonies. Only the continued presence of the research team has kept Petit Manan relatively free of large gulls. In terms of its primary goal of the restoration of a viable tern colony on Petit Manan Island, the gull control project has been an unqualified success. From near collapse in 1983 total tern numbers in the colony have increased to a record high of over 2000 pairs in 1995. In the early 1970s, prior to the arrival of herring and great black-backed gulls on the island, common tern numbers increased and arctic tern numbers declined leading to equal proportions of the two species by the mid-1970s. In the first few years of management, arctic terns outnumbered common terns, but by 1988 the common tern had become dominant, a status they retain through the present day. This change in relative proportion may be part of a general northward shift in the arctic tern's nesting range. One reason for the decline in nesting arctic terns on Petit Manan may be the establishment of another tern colony in more suitable arctic tern habitat. In 1984 the National Audubon Society and the US Fish and Wildlife Service removed gulls from a large segment of Seal Island in Penobscot Bay, approximately 90 km west of Petit Manan and 32 km offshore as part of a project to attract Atlantic puffins and other seabird species to the area. In 1989 arctic terns first nested on Seal Island, and numbers increased to a high of approximately 500 pairs in 1995. Arctic terns are known to favor outer islands, and the initial development of this colony, which had not been active since the early 1950s, could only come at the expense of other nearby colonies such as Petit Manan. The roseate tern's status as both a state and US federally listed endangered species has been a significant component of management concern. Roseate tern numbers on Petit Manan Island increased through 1993. In 1994 and 1995 nesting pairs of herring gulls were found in the dense vegetation at two sites used in previous seasons by small clusters of six to nine pairs of roseate terns. Although the gull nests were destroyed upon discovery, the gulls were present during the peak nesting period for terns, and no birds settled in the areas. This example illustrates the potential impact of small numbers of territorial gulls on the restoration effort. Some of the increase in laughing gulls may be due to recruitment from expanding colonies in southern New England, but it is also likely that local fledging success has benefited from reduced predation. Prior to the removal of herring and great black-backed gulls, the laughing gulls on Petit Manan nested in the densest vegetation on the island. As the number of laughing gulls has increased over the course of the management program the laughing gulls have spread into less densely vegetated areas. Part of this change in distribution may be due to vegetation changes, but it seems likely that the elimination of large territorial gulls has freed the laughing gulls to make greater use of more of the island. Laughing gulls in Maine nest only on managed islands. Common eider ducks appear to have benefited from the reduction in predatory gulls on Petit Manan and Green Islands. It should be noted, however, that although eiders suffer severe chick predation from large gulls, evidence from Finland suggests that it may be beneficial for eiders to nest on islands that have at least some gulls capable of driving away crows and ravens (Corvus sp). Corvids are extremely effective predators on eider eggs, and it is possible that the loss of some chicks to gulls is preferable to the loss of an entire clutch of eggs to a raven. Ravens have attempted to nest on four occasions on Petit Manan since the gulls were removed, and have preyed on eider nests, but they have not nested on Green Island. Eider ducks appear to use small coves along the eastern and southern edge of Petit Manan as relatively gull-free nurseries' prior to dispersal to the mainland bays. Creches of 5Â±15 eider chicks are regularly observed around Petit Manan, these are seldom seen near Green Island. Although small numbers of black guillemots had been known to nest on Petit Manan prior to the collapse of the tern colony, their numbers have increased substantially under the management program. The lack of deep crevices or suitable soil for burrowing makes these birds vulnerable to predation by loafing gulls. It is worth suggesting that black guillemots are willing to nest in less suitable substrate on the island, where protection is provided by the management team, in preference to suffering higher levels of interference and predation on unmanaged islands. The establishment of nesting Atlantic puffins on Petit Manan may be part of a larger southward expansion of this species' range. Some banded birds from the Audubon Society's reintroduction program in Penobscot Bay have been seen on the island, however the proportion of these birds has declined significantly in recent years. A number of islands with apparently more suitable habitat exist between the nearest naturally occurring Atlantic puffin colony on Machias Seal Island, Canada and Petit Manan, yet only Petit Manan has been selected as breeding site. As with the black guillemots, the elimination of predatory gulls seems to be a benefit that outweighs the advantage of better nesting substrate. Factors limiting recovery of the ecosystem: It is important to differentiate between changes directly caused by management activities and changes that are part of larger regional trends that may mimic, amplify, or mask presumed management outcomes. Islands vary significantly in area, history, vegetation, topography, and distance from shore and other islands. A precise control for any management treatment is impossible. Populations of all these species have changed during the course of the management program, with some of these changes are doubtless occurring independently of management efforts. Economic vitality and local livelihoods: Perhaps the most heartening aspect of this project has been the level of collaboration achieved between federal, state and private organizations. Representatives

of a wide variety of groups involved in seabird conservation in the Northeastern US meet twice each year under the aegis of the Gulf of Maine Seabird Working Group to pool data, compare techniques, and to plan future strategies. Management and research decisions are usually reached by consensus among the interested parties. A Gulf of Maine Tern Management Plan was developed as a result of the on-going dialog among members, and large portions of the Plan have been adopted into the State of Maine official planning guide. This sort of collaboration is of increasing importance as we recognize the trans-boundary nature of most conservation issues.

Monitoring and Data Sharing

Does the project have a defined monitoring plan?:

NO

Open Access URL:

()

Long Term Management

STAPER