A Strategic Plan To Protect Island Ecosystems In Alaska
From The Introduction of Rodents

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Introduction

Rats (Rattus norvegicus, R. rattus, and R. exulans) are commensal with humans and are opportunistic predators on a variety of birds and mammals. Rats have been introduced to more than 85 percent of the world's island ecosystems with generally disastrous consequences to endemic wildlife. The resulting extinctions and reductions in populations of numerous native species can best be characterized as ecological catastrophes. Rats continue to spread to additional islands around the world, primarily through moored vessels and shipwrecks. Twenty-seven species of seabirds are known prey of rats.

Background and Justification

Norway rats (R. norvegicus) have become established on at least 22 islands in the Alaska Maritime National Wildlife Refuge, beginning with a shipwreck on Rat Island in the western Aleutian chain in 1910. Establishment of rats on most other islands within the refuge occurred during World War II. The introduction of rats to Little Alaska Island may have occurred as recently as 1980. Norway rats also occur on many other islands in Alaska, primarily in the Alexander Archipelago in Southeast Alaska. Roof or black rats (R. rattus) are not known to exist in Alaska but they probably could exist in the more temperate areas of the state. Roof rats are known from the Queen Charlotte Islands in British Columbia.

In the Aleutian Islands, rats undoubtedly prey heavily on burrow and crevice nesting seabirds such as auklets, murrelets, and storm-petrels; however, examples of the extirpation of seabirds in Alaska by rats are unknown. This may be the result of the more obvious effects of predation of those same seabird species on the same islands by introduced red (Volucella vulgo) and arctic foxes (Alomys lagopus), and lack of baseline data on indigenous wildlife populations prior to rat and fox introductions. On Langara Island in British Columbia, however, introduced rats have either extirpated or nearly extirpated large populations of six burrow nesting seabird species. Only a telflit and declining population of Ancient Murrelets (Synthematorus antiquus) persists on this island because its life history strategy of precocial sea-going chicks reduces their annual window of vulnerability.

Unlike countries such as New Zealand, which have contingency plans to deal with the grounding of vessels on rat-free islands, Alaska currently has no such protection. On many islands in Alaska, once rats are established they may be impossible to eradicate.

Two related issues highlight the need for greater vigilance on the part of the Fish and Wildlife Service (Service) to counter the threat rats pose to endemic wildlife populations on islands in Alaska: 1) rapid and intense developments associated with commercial fish processing in the Pribilof Islands; and 2) increased probabilities of shipwrecks on islands as a result of commercial fishing activity and shipping, and the proximity of the great circle shipping route between the west coast of North America and Asia to seabird nesting islands in the Aleutian Islands and western Gulf of Alaska.
In response to the increased threat of rats to seabirds in Alaska, the Service has launched an effort to prevent further introductions and to begin to eradicate rats from infested islands.

This plan is designed to provide an overall framework for Service activities related to preventing the introduction of rats to islands from ships and harbor activities, responding to shipwrecks, and eradicating rats from islands in Alaska. The plan is organized into three parts: 1) goals and objectives; 2) a step-down outline and narrative which describes various tasks that need to be completed in order to meet the goals and objectives; and 3) an implementation table which lists each task along with related information on lead and cooperating agencies and organizations, priority, and estimated costs.

Goals and Objectives

Goal:

To protect and enhance island ecosystems in Alaska that are threatened or already affected by introduced populations of Norway rats.

Objectives:

1. To prevent the introduction of rats to the Pribilof Islands where increasing development, shipping and commercial fishing activity have elevated the potential for introductions.
2. To respond, as necessary, to shipwrecks to prevent the introduction of rats to additional islands in Alaska.
3. To eradicate rats from certain islands in Alaska.

Step-Down Outline and Narrative

1.0 Prevent the introduction of rats to islands in Alaska with important wildlife resources that are affected by increasing development, shipping or commercial fishing activity.

1.1 Continue ongoing prevention efforts in the Pribilof Islands.

1.1.1 In cooperation with the cities of St. Paul and St. George, establish bait and trap stations at the St. Paul and St. George harbors.

In 1993, the communities of St. George and St. Paul, assisted by Alaska Maritime National Wildlife Refuge staff, established bait and trap stations in their harbors to eliminate rats that may disperse from infested commercial fishing and cargo vessels. The
Service goal is to assist the Pribilovians in becoming self-sufficient in checking and maintaining the station networks.

1.1.2 Assist the cities of St. Paul and St. George in developing and implementing effective city ordinances requiring that commercial fishing vessels and processors be rat-free and that they establish bait and trap monitoring stations.

Success in keeping rats off of the Pribilof islands ultimately depends on the local communities and industries. The cities of St. Paul and St. George recognize the threats rats pose to their island ecosystems and have developed city ordinances with the assistance of the Service.

1.1.3 Work with commercial fish processors and the shipping industry in the Pribilofs to establish and maintain rodent preventative measures.

Alaska Maritime National Wildlife Refuge staff have joined with the Pribilovians and industry to conduct training and inspection of vessels and commercial facilities.

1.2 Develop a training video on the threat rats pose to island faunas in Alaska, how to inspect ships for rodents, and how to set up a prevention program.

The Service received a Challenge Cost Share Grant to produce a training video on the rat threat with the Alaska Department of Environmental Conservation and Pribilof School District as partners.

1.3 Develop and distribute information to the fishing and shipping industries encouraging rat-free operations.

Without cooperation of the fishing and shipping industries, maintaining the Pribilof Islands as rat-free is likely to fail. Education and outreach targeted at these industries could be very effective. As part of these efforts, posters and brochures being developed by the Alaska Maritime National Wildlife Refuge should be completed and distributed.

2.0 Respond, as necessary, to shipracks to prevent the introduction of rats to additional islands in Alaska.

2.1 Establish a cross-program Service team (rat pack) to prevent rats from being introduced to additional islands in Alaska.

In fall 1993, the Service established such a team consisting of Art Sowls of the Alaska Maritime National Wildlife Refuge, Laurie Fairchild of the Western Alaska Ecological Services field office, and Tony DeGange of the Division of Migratory Conservation in the Regional Office. The Alaska Maritime National Wildlife Refuge is an important stakeholder in this issue, and staff in the Homer and Adak offices have
a long-standing interest in the eradication of introduced predators from refuge lands. Ed Bailey, Vernon Byrd, John Martin and Dan Boone have contributed substantially to this project to date.

2.2 Develop a plan that outlines how the Service will respond in the event of a shipwreck on an important seabird nesting island.

2.2.1 Conduct a risk analysis on type of vessel and status of island that will guide the type of response to a ship grounding.

Whether the Service responds to a particular ship grounding may depend on whether the island is part of the refuge system, has nesting populations of seabirds or has other high resource values that could be threatened by rats (indigenous small mammals, plants, etc.), and the probability that the particular type of vessel has rats aboard.

2.2.2 With the National Marine Fisheries Service (NMFS), develop a profile on the probability of a ship being infested with rats based on vessel type. The NMFS has an observer program for commercial fishing vessels. With the cooperation of NMFS, we will establish a mechanism for observers to report on the status of rodent infestations on individual ships.

2.3 Stockpile traps and rodenticides at field stations and on the M/V Tigris for rapid response. Preventing rats from coming ashore from a grounded vessel may necessitate an immediate response. Such a rapid response may be facilitated by stockpiling equipment at sites as close to potential grounding sites as possible.

2.4 Incorporate rat response plans and documents into Region 7’s Oil and Hazardous Substances Spill Contingency Plan (Plan).

The Region’s Plan provides the framework for guiding how the Service will respond to releases of hazardous chemicals and other catastrophes.

2.5 Educate and coordinate with the Regional Response Team (RRT) on the threat of rats to endemic wildlife.

The multi-agency RRT coordinates Federal and State responses to environmental perturbations. Educating this group on the threats rats pose to endemic wildlife could be very beneficial.

2.6 Train Service personnel and cooperators on the threat of rats to wildlife and obtain State certification for Service personnel and cooperators on the use of rodenticides.
The State of Alaska requires individuals to be certified to use rodenticides. To be effective, the service needs a corps of trained individuals located in coastal Southeast, Southcentral and Southwestern Alaska who can respond to shipwrecks in their area. Training should occur as soon as possible to be ready in the event of a shipwreck.

2.7 If necessary, develop a Memorandum of Agreement with the U.S. Coast Guard that defines roles of each agency in responding to shipwrecks in Alaska.

The U.S. Coast Guard has a major role in responding to oil spills, shipwrecks and other calamities in coastal regions in Alaska. In some cases, only the U.S. Coast Guard has the ability to get people and supplies to remote coastal areas. The service may have to rely on the U.S. Coast Guard for transportation and access to shipwreck sites.

1.0 Eradicate rats from select islands in Alaska.

1.1 Eradicate rats from Shemya Island.

The Service and the U.S. Air Force have recently initiated a program to eradicate rats from Shemya Island. The planning effort for the 3-year project will begin in 1995.

3.1.1 Develop an Environmental Assessment for the use of rodenticides to eradicate rats from Shemya Island.

3.2 Cooperate with eradication of rats on Langara Island in British Columbia.

The Canadian Wildlife Service has proposed the eradication of rats from Langara Island. Their schedule calls for establishing a trail network on the island in 1994 with baiting and trapping to commence in 1995. This could be an ideal testing to train Service personnel for similar operations in Alaska.

3.3 Evaluate other islands, develop a plan and schedule, and find a funding source for eradication of rats from other islands within the Alaska Maritime National Wildlife Refuge.

4.0 Conduct other activities in support of prevention, response and eradication.

4.1 Develop an Environmental Assessment for the use of bromethalin and brodifacoum on remote islands in Alaska to prevent raccoon introductions (completed).

Bromethalin and brodifacoum are second generation anticoagulants (rodenticides) commonly used on rats throughout the world. They have been successfully used to eradicate rats from islands in New Zealand.
However, in the United States, use in Alaska, especially on wildlife refuge lands, may be controversial and warrants compliance with the National Environmental Policy Act.

4.2 Obtain a Section 18 Federal Insecticide, Fungicide, and Rodenticide Act exemption from the Environmental Protection Agency (EPA) for use of rodenticides on remote islands.

Use of second generation anticoagulants on remote islands requires an exemption from specifications on the labels of these products that specify where and how these compounds are used. This exemption was obtained in January 1995.

4.3 Obtain a 26C Alaska State Registration for use of second generation anticoagulants.

Although a Section 18 exemption has been obtained from EPA allowing emergency use of second generation anticoagulants, registration with the State of Alaska has been requested for long-term authorization.

4.4 If necessary, obtain permission from the Alaska Board of Game to poison rats in Alaska on non-Service lands.

Alaska State regulation may require the Service to obtain permission from the Board of Game to use rodenticides to kill rats on non-Service lands.

4.5 Continue and expand education and outreach activities.

4.5.1 Through the Region’s Public Affairs Office, continue to provide materials to the media highlighting this issue.

Not many people are aware of the threats rats pose to island faunas, particularly in Alaska, where most people do not know that rats exist. Continued media support is an essential part of the education process.

4.5.2 Continue education programs in schools and assist with development of seabird curriculum.

Often, the best way to get information into local communities is through the children in that community. Refuge and other Service staff will provide programs to school children on this issue on an opportunistic and programmed basis. The Service effort to develop a school curriculum on seabirds will include the rat issue.

4.6 Conduct research on Alaskan rats and their effects on seabird populations.

4.6.1 Study the effects of rat predation on nesting auklets at Kiska Island.
Rats are known predators of seabirds at Kiska Island in the western Aleutian Islands. Elimination of foxes from this island in the mid-1980's may have inadvertently resulted in an increase in the rat population. Kiska Island would be an ideal setting to study the effects of rats on seabirds and to study the life history characteristics of an insular rat population. Work may be accomplished by contract, research work order, or by Service staff.

4.6.2 Study the life history characteristics of rats on Adak Island.

Adak is a good location to study an insular population of rats in order to contrast a "wild" subpopulation and one commensal on humans.

4.6.3 Compile data on the biology and present distribution of rats in Alaska.

Rats are widespread in Alaska and are found as far north as Nome; yet, little is known of their biology and how they have adapted to high latitudes. Such information could be useful when designing control and prevention methodologies.

4.6.4 Investigate other methods to control or eradicate rats.

An orally administered immuno-contraceptive is a new control technique in the development phase. Early tests on rats have shown promise. The feasibility for field application of this technique in Alaska, when it becomes available, needs to be assessed.

Implementation

The following table lists each task identified in the step-down outline, provides a priority ranking, and lists the lead agency or organization and cooperating agencies and organizations. Wherever possible, the level of funding needed to complete each task is provided for the current fiscal year and the next four fiscal years. Currently, there are few dollars available in the Service's budget that are devoted to prevention, response and eradication of rats. This document provides the necessary information for filling those funding gaps in the future.

This document will be reviewed and updated annually.
<table>
<thead>
<tr>
<th>Brief Task Description</th>
<th>#</th>
<th>Priority</th>
<th>Duration</th>
<th>Lead</th>
<th>Crop</th>
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<th>FY96</th>
<th>FY97</th>
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<td>Train Service personnel and obtain ADEC red tide crisis HAZWOPER certification</td>
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<td>0.5 yr</td>
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<td>Develop MDA with Coast Guard</td>
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<td>Eradicate rats from islands in Alaska</td>
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<td>Eradicate rats from Shemya Island</td>
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<td>Develop EA for rat eradication on Shemya</td>
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<td>Cooperate with eradication efforts on Langara Island in British Columbia</td>
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<td>Evaluate other islands for rat eradication and find funding sources</td>
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<td>1 yr</td>
<td>FWS</td>
<td>3K</td>
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<td>Conduct activities related to prevention, response and eradication</td>
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<td>Develop EA for use of brodifacoum and bromidrin</td>
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<td>Obtain Section 18 exemption for use of rodenticides</td>
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<td>Obtain and Registration from State of Alaska</td>
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<td>ADEC, FWS</td>
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<td>If necessary, obtain authorization from Alaska Board of Game to use rodenticides</td>
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<td>0.5 yr</td>
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<td>Expand outreach and education activities</td>
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<td>FWS, St. Paul</td>
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<td>Provide materials to media</td>
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<td>Ongoing</td>
<td>FWS, ADEC, St. Paul</td>
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<td>Continue education programs in schools</td>
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<td>Conduct research on rats</td>
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<td>Study the effects of predation by rats on seabirds at Kiska</td>
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<td>Study Rife Hunting of rats on Adak</td>
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¹ Base funds; ² Challenge cost share; ³ Source not identified; ⁴ Department of Defense Legacy Program; ⁵ FWS Ecosystem Management Funds

Acronyms used in table:

ADAG  Alaska Department of Fish and Game
ADEC  Alaska Department of Environmental Conservation
ADCC  Animal Damage Control Division of U.S. Department of Agriculture
CWS  Canadian Wildlife Service
DWRC  Denver Wildlife Research Center of U.S. Department of Agriculture
EPA  U.S. Environmental Protection Agency
FWS  U.S. Fish and Wildlife Service
NBS  National Biological Survey
NMFS  National Marine Fisheries Service
UAF  University of Alaska at Fairbanks
USAF  U.S. Air Force
USCG  U.S. Coast Guard
USN  U.S. Navy

Industry refers in general to the fishing industry operating in the Bering Sea.
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