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Frequently Asked Questions Rat Island Habitat Restoration Project

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(updated 10/8/08)

What is happening?

A conservation partnership is restoring the native ecosystem of Rat Island in the Alaska Maritime National Wildlife Refuge by eliminating introduced rats. The ecosystem, especially the bird population, was decimated by the introduction of Norway rats via a shipwreck in the 1780's. There are virtually no seabirds and few other birds left on Rat Island. Successful rat eradication would restore habitat and allow birds to re-colonize the island. The first step in island restoration, applying rodenticide to the island, was completed in early October. Biological monitoring in the summer of 2009 and 2010 will determine if all the rats have been eliminated.

Tell me more about Rat Island

Rat Island is uninhabited and is located about 1300 miles west of Anchorage in the Aleutian Islands. The 6,861 acre island became part of the Alaska Maritime National Wildlife Refuge (formerly the Aleutian Islands National Wildlife Refuge) in 1913. The island is part of the National Wilderness Preservation System. Topography of the tree-less island is characterized by steep coastal cliffs, a small central mountain range and a broad, rolling plateau of maritime tundra.

Who is sponsoring this project?

The Alaska Maritime National Wildlife Refuge, part of the U.S. Fish & Wildlife Service, The Nature Conservancy and Island Conservation, a science based non-profit organization, are sponsoring the project.

How does this fit with the Refuge's purpose?

One of the purposes of the Alaska Maritime Refuge is to conserve seabirds, other migratory birds, marine mammals and the habitats on which they rely. Seabirds flourish on rat-free Refuge islands with colonies sometimes numbering in the millions. Most of North America's seabirds nest on the Refuge. To support this purpose, the Refuge's goal for this project is to restore the native habitats through removal of an introduced predator, allowing birds to re-colonize Rat Island.

How can I learn more?

A website has been established to keep the public and media updated on the action. Visit www.seabirdrestoration.org. An Environmental Assessment providing details on the proposed action and a no action alternative was released on December 12, 2007, for a 30-day public comment period. The Environmental Assessment can be found online at http://alaskamaritime.fws.gov/news.htm. Paper copies can be requested by e-mailing rat_island@fws.gov or calling (907)235-6546.

How did the public react to the Environmental Assessment?

Thirty seven public comments, nearly all supportive, were received during the comment period. More can be read about the comments and the Fish & Wildlife Service's response to the comments in the "Finding of No Significant Impact" released on April 15, 2008. It can be found online at http://alaskamaritime.fws.gov/news.htm. Paper copies can be requested by e-mailing rat_island@fws.gov or calling (907)235-6546.

What impact did rats have on Rat Island?

Rats are voracious predators on birds, chicks and eggs. Introduced non-native rats have been responsible for about half of all recorded bird extinctions globally. On Rat Island, they have eliminated virtually all seabirds and many other birds. There are no native land mammals on Rat Island so the birds had no natural defenses against these aggressive predators. Also, on the treeless Aleutians, birds must nest on the ground, in burrows or on cliffs and most of these nesting sites are easily accessible to rats. Because rats are omnivores that will feed on almost anything, they have also affected other components of the island's ecosystem such as plants and intertidal organisms.

Do the Partners have any experience at restoring island habitat?

The Refuge has over 50 years of experience restoring island habitats by removing introduced species. Introduced foxes have been removed from over 40 refuge islands restoring over one million acres of habitat. Seabirds on some of these islands have increased four and five fold since foxes were removed. Waterfowl, including loons and eiders, have increased dramatically on many of these islands. The Aleutian cackling goose was saved from near extinction; whiskered auklets which were once rare are now locally common; and the Evermann's rock ptarmigan has been successfully reintroduced to fox-free habitat. The Refuge plans to repeat this success with rat eradication.

Refuge partners in the project, Island Conservation and The Nature Conservancy, have had extensive experience with restoring island habitats by removing introduced predators including rat eradications on other islands in the U.S. and internationally. The Refuge and its partners have also cooperatively conducted pilot studies in the Aleutian Islands examining bait effectiveness, risk to non-target species and logistics of an eradication.

What birds will benefit from eradicating rats, and how long will it take to bring them back?

Over time, all ground and burrow nesting birds should benefit from this action. Tufted puffins, ancient murrelets, storm petrels, song sparrows, glaucous-winged gulls, and possibly whiskered auklets and Cassin's auklets are likely to re-colonize the island. Bird species already nesting on rat-free, nearby, off-shore islets will re-establish populations on Rat Island quicker than those not present in the immediate area. Populations of winter wrens, Lapland longspurs, Aleutian cackling geese and other waterfowl currently nesting on the island will also increase after eradication.

The rats have been there so long why aren't they considered part of the ecosystem?

Rats are not native to Alaska or even North America. Each native species evolves over thousands of years in the presence of other species, and develops a natural pattern of relationships with other native species – as competitors, predators, disease organisms, and so on. Most often species are also limited by physical or other barriers. For example, land is a barrier to the spread of aquatic species just as water can be a barrier to the spread of many land animals. Within these barriers, natural systems (ecosystems) begin to form.

Because the plants, invertebrates and wildlife of Rat Island did not evolve with rats or any mammalian predators, the introduced rats disrupted the natural ecosystem so fast that native species were unable to adapt. The rats have eliminated most seabirds, greatly diminished the land birds and altered other parts of Rat Island's natural ecosystem. The affected bird species cannot nest successfully on this island until the rats are eliminated. This island is part of a National Wildlife Refuge whose purpose is to conserve natural biodiversity and native wildlife. The Aleutian Islands are home for Alaskan seabirds. Five auklet species nest only on islands in the North Pacific and Bering Sea. Norway rats are not Alaskan wildlife; they have a severe, negative impact on native Alaskan wildlife.

How did you remove the rats?

Rats are extremely prolific with one pair capable of producing thousands of descendents in just a year. Every rat must be eliminated from the island to prevent the population from building up again. The only known, feasible way to remove rats from large, rugged islands is with the use of bait containing a rodenticide. Brodifacoum is the rodenticide chosen for this project because it has the highest probability of eradicating rats - it acts relatively quickly, degrades to base components of water and carbon dioxide, and has been used successfully on other large island projects around the world. Brodifacoum is the active ingredient in many household rodenticides. Helicopters were used to apply the bait to insure all parts of the rugged island were covered. Hand baiting was also done in sensitive areas. Biological monitoring over the next two summers will determine if we were successful in removing all the rats. Many more details can be found in the Environmental Assessment.

Have projects like this succeeded elsewhere?

Rats and other rodents have been successfully removed from more than 300 islands worldwide frequently resulting in rapid recovery in the native bird populations. Some large island rat eradications used the same method proposed here, aerial application of brodifacoum. The most recent similar project in North America was on Anacapa Island in the Channel Islands National Park, California.

Why didn't you just introduce predators on the rats?

There are no native land predators in the central and western Aleutians. Any introduced predators would further disrupt the natural ecosystem and could cause even greater threats to native species than the rats are already causing. Introducing predators has been tried repeatedly in other parts of the world ending in miserable failures such as the mongoose in Hawaii. The predator becomes a new kind of problem and is never capable of killing off all the rats. Cats are particularly harsh predators on birds. The Alaska Maritime Refuge is charged with restoring and maintaining native biodiversity. Further introductions would work counter to this mission.

Why didn't you use rat birth control?

There are no rat birth control methods that can guarantee 100% success even in the highly unlikely event that all rats could be captured to administer the birth control measure. Because rats reproduce so quickly, all rats must be eliminated at once from the island or the problem would not be solved. It is also extremely expensive and difficult to work in the remote, storm-tossed Aleutians, more than 1300 miles west of Anchorage. This is no environment for experimenting with unproven techniques.

Can birds be harmed by the rodenticide?

A limited number of birds are at risk, as there are few birds on the island. The rodenticide was applied in October when less birds are present. Some omnivorous birds that overwinter on the island were likely exposed to the rodenticide, and we anticipate there will have been some unintentional loss of grey-crowned rosy finches, snow buntings, rock ptarmigan and winter wrens. The Refuge considers this an unfortunate but acceptable risk because these birds' numbers will likely rebound, far beyond their current levels, once the predatory rats are gone. The populations of most breeding birds on the island are suppressed by rat predation. Populations of these species flourish on neighboring islands. More details can be found in the Environmental Assessment.

Aren't there predators or scavengers that were exposed to the rodenticide by eating dead rats?

There are no land mammals on Rat Island. Eagles occasionally take rats. However, during a 2006 bait trial conducted on islets near the Aleutian island of Adak in preparation for this project, 88% of the rats exposed to the rodenticide died in their underground burrows and were thus inaccessible to eagles. An eagle, being a fairly large bird, would have to eat many rat carcasses in order to consume a lethal dose of the rodenticide . It is unlikely that any eagles will suffer noticeable effects from eating rats. In the 2006 bait trial, no eagles were found sick or dead. More details can be found in the Environmental Assessment.

What mammals could be affected by the rodenticide?

There are no land mammals on Rat Island. A Steller sea lion rookery is located on an off-shore islet and sea otter and harbor seals can be found in the area. These are all large, carnivorous animals so it is extremely unlikely that they would eat a grain based bait pellet should a stray piece of bait end up in their vicinity. It is unlikely that they would be adversely affected by the proposed action. More details can be found in the Environmental Assessment.

How long will the rodenticide persist in the environment?

Most bait will be consumed by the rats. Some pellets will remain on the surface where molds and microbial degradation will break them down. Although brodifacoum is persistent in soils with a half-life of 157 days, it is closely bound to soil particles where it is unavailable to vertebrate scavengers. Invertebrates are not generally affected by brodifacoum. It is relatively immobile in soil and the potential for groundwater and surface water contamination is low. It eventually breaks down into carbon dioxide and water. More details can be found in the Environmental Assessment.

How will fish and the marine environment be affected?

Some bait pellets may have entered the nearshore waters although bait application techniques were designed to limit bait entry into the water. Brodifacoum's low water solubility and strong affinity to the bait pellet's grain matrix largely prevents brodifacoum from going into solution. On Anacapa Island where identical application measures were used, analysis of water samples from the intertidal zone taken 24 and 48 hours after aerial bait application did not detect any brodifacoum residue. In the 2006 bait trail on the Adak islets, no residue was found in fresh water. In that same bait trial, no fish were observed eating the bait pellets. Fish are not attracted to the grain based pellets. There is no reasonable likelihood that water bodies on or surrounding Rat Island will register biologically harmful, or even detectable, levels of brodifacoum as a result of bait application to the island. Samples will be collected before and after bait application and tested for brodifacoum. More details can be found in the Environmental Assessment.

Will people be affected by this project either on the island or elsewhere?

Rat Island, 1300 miles west of Anchorage, is uninhabited and, because of its remote location and harsh environment, is very rarely visited. The nearest community, Adak, is about 200 miles away. No fishing boats approached the island while the rodenticide application was occuring. The expected increase in birds may benefit wildlife watchers on cruise ships in the Aleutians and hunters on inhabited islands or elsewhere on the migratory path of waterfowl.

What happens next?

The island will be monitored over the next two summers to determine if all the rats were eliminated. Further monitoring will evaluate how the native ecosystem is recovering now that the rats are gone. If the Rat Island eradication proves successful, we will continue to evaluate other refuge islands for restoration work.

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