

# Who let the Rats out?

This is not about the pop song or the pied piper's charm. No. Its about rats on the small offshore islands of Aleipata district! These islands contain a special range of biodiversity, in particular the islands of Nuutele and Nuulua which have the most significant remaining turtle nesting area in Samoa, the last nesting sea bird colony in Samoa, and also provide a refuge for the rare ground dove, bats and other land birds. Its marine habitats provide a rich recruitment area for reef fish and shellfish, and appear to support marine species which are over harvested elsewhere. Such species include giant clams and the turbo shell. The red footed and brown boobies, black and white terns, frigate bird, and other seabirds comprise the last significant nesting sea bird colonies in Samoa.

These island ranked 30 in an international review of the conservation value of a total of 226 South Pacific islands in 1986. Nuutele island has been identified 26 years ago as a national park because of its importance to biodiversity conservation with the special emphasis on birds protection and conservation.

The Aleipata Marine Protected Area Management Plan has identified these offshore islands (Nuutele and Nuulua) as a special and high priority component of the Aleipata Marine Protected Area. In the plan's goals for 2002-2006 its states that '...by the end of 2006 ... offshore islands (Nuutele, Nualua, Fanuatapu and Namua) will have had a restoration programme designed and begun implementation...'

So what have rats to do with all these islands? Although at times fishermen have targeted the young of some of the seabirds nesting there and sea turtle nesting grounds, it is now rats that appear to have the most significant threat to these islands biodiversity especially on sea and land bird species.

SPREP supported feasibility studies are underway to assess the potential of several options of eradicating rats from the islands. These studies are being conducted by a team of international scientists and local experts of the Ministry of Natural Resources and Environment. A third phase of the studies is taking place this week and next week. The results from these studies will determine the best options for removing rats completely off these islands before the end of the decade.



**Nuutele Island & its location:** The offshore island of Nuutele as the main basis of this study and biodiversity restoration project.

And just how bad the rat problem is to warrant their ejections once and for all from the islands. A review of the impacts of rats on biodiversity worldwide have shown that their adverse effects on native plants and animals and habitats, are nowhere more apparent than on islands. Many different kinds of birds have been affected by rats, including surface-nesting and burrow nesting seabirds, shorebirds, wetland birds and forest birds. Eggs, juveniles and adults can all be eaten by rats. On a few islands rat invasion has had a catastrophic effect on the avifauna, Lord Howe Island being a dramatic example. On other islands, extinction apparently caused by rats occurred before the fauna were known to Europeans, for example, the loss of several species of wren and a snipe from mainland New Zealand. In addition, the extinction of the greater short-tailed bat from Big South Cape after 1965 in New Zealand has been attributed to the invasion of rats.

Other small mammals are vulnerable to rats, such as the native rats of the Galapagos Islands which have become extinct on several islands invaded by the foreign rats. In the West Indies, the post Columbian spread of *Rattus rattus* probably explains the extinction of a number of small non-flying mammals. Many island reptiles and amphibians have also suffered heavily from rats. There is also strong evidence for *Rattus exulans* causing local extinction of several species of gecko in New Zealand, and similar evidence suggesting that *Rattus rattus* has eliminated a large skink from some islands in the Seychelles.



Rats eat many parts of plants, including flowers, fruits, stems, bark, leaves, roots, and seeds. When *Rattus rattus* established on Lord Howe Island, regeneration of the palm *Howea forsteriana* was curtailed by the rats eating the seeds. Regeneration is now possible only when rats number are controlled.

"Where rats cause declines and extinction of a significant proportion of an islands fauna, the whole island is permanently changed. The loss of particular species of birds or mammals is obvious, but other types of change also occur which are less spectacular but just as damaging. For example, some of the animals lost, whether vertebrates or invertebrates, may be critical links in major food chains on the island, or the rats may bring with them new diseases and parasites which infect the native animals. Also, rats often

feed on the nutritious reproductive parts of plants, thereby reducing dispersal and regeneration. Habitat composition and structure are then affected, and the whole biological community of the island is likely to suffer. Thus the total effect of introducing rats to an island is far reaching, with consequences that are difficult to predict.

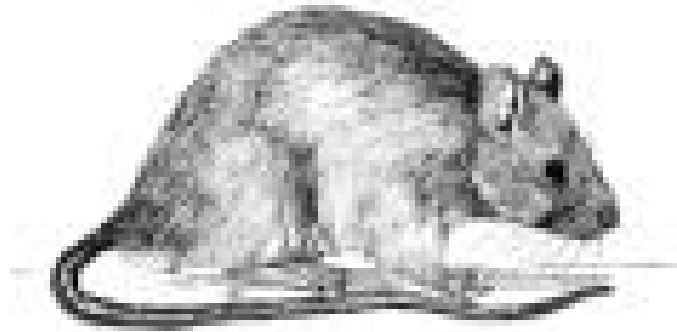
No detailed studies were conducted in Samoa to investigate the impact of rats ecologically to the indigenous ecosystems of the Samoa islands including Nuutele. Like many islands of the Pacific, our islands were rat free before humans discovered and colonized them thousands of years ago. Rats were accidentally then introduced and spread throughout the main islands of Upolu and Savaii. No one had ever concerned about it until rats began to destroy the nations economy by devastating the cocoa industry as a major export of Samoa in the 1970s. Damages by rats were only discovered and regularly seen with agricultural crops and stored food during this time but little knowledge was available with regard to the ecological impact of rats to plants and animals, particularly birds.

The adverse effects of the three rat species on island faunas differ, particularly their effects on birds. Birds nesting on or near the ground or in burrows are at greatest risk from *Rattus norvegicus*, whereas tree nesting birds area at greatest risk from *Rattus rattus*. *Rattus exulans* takes birds on or near the ground as well, but less is known about its

predatory behaviour than for the other two species. On oceanic islands *Rattus rattus* has caused greater losses of forest birds in European times than any other rat, while in the same period *Rattus norvegicus* has caused greater losses among seabirds. Thus the core of our problem is to prevent either of these two old-world rats from reaching more islands, even those where on rat species or mice are already present.

Although some island faunas are more vulnerable to a rat invasion than others, the circumstances that allow rats or mice to reach an island are all human induced: settlements, construction of wharves, boat slip ways and airstrips, importation of food stuffs, exploitation of the natural resources of the island and its surrounding waters (e.g fishing, mining, oil drilling), establishment of military bases or weather and research stations, shipwrecks, and sometimes boating associated with tourism and recreation.

The wildlife management approaches for remote islands with acceptable distance (usually more than 200m) from mainland and rodent invaded islands as internationally recommended is the 'Eradication Method'. The eradication of an island can be sanctioned once a single rat is sighted because its difficult to control a small number of rats down to a zero level using the normal trapping method. The protocol emphasizes here the importance of totally eliminating all rats and their reproductive mechanisms so that the population of rats is brought down to zero.



Eradicating rats using massive application of toxin by aerial or ground based operation requires substantial resources. These resources in terms of funds, human, and many more are highly required from the beginning of this operation. A substantial effort and commitment of these resources begins right from the planning process. The most difficult

part as usual in the planning of such project is the extraction of raw data and information to help decision-making. Usually such wildlife management project takes 90% of the time for planning and only 10% for the actual implementation of the planned activities. It may takes weeks, months and years to perform studies and researches to collect required information but it only takes one week or month to implement such operation.

Eradication can be carried out by aerial spraying of toxic baits using helicopters on ground or by ground based operations where toxic baits are evenly and systematically distributed to designed stations by hand. The designed station exposes only the target species to the bait while the non-target ones are restricted from accessing it. Therefore, the method of aerial spraying is more efficient and cheaper but too risky for the non target species that potentially exposed and attracted to the toxic baits. The ground based operation on the other hand is time consuming, expensive, labour intensive and sometime too risky for the people involved particularly with rugged and steep topography.

Poisoning is the most cost effective means of killing rats in large numbers or isolated places. Rodenticides are of two general types: chronic poisons requiring several doses before a lethal concentration accumulates and taking 3-7 days to cause death, and acute poisons which act within a few hours of a single dose. Chronic anticoagulant rodenticides are the first choice for island conservation campaigns. When selecting a poison careful considerations should be made for the cost, toxicity and palatability to rats, the type of operation being mounted, whether a single dose poison is needed, toxicity to other animals and the chances of accidentally poisoning them, and the types of bait being offered.

For example the chemical warfarin is cheap and readily available. It is also much less toxic to birds than to rats and so reduces the dangers of accidental poisoning. It is therefore suited to many situations where only a reduction in rat numbers is required. Recent eradication campaigns in New Zealand, however, have relied on brodifacoum and bromadiolone particularly because of their single dose effectiveness. However the greater toxicity of these rodenticides brings increased dangers of killing non target animals, especially birds of prey feeding on carcasses of poisoned rats.

These different eradication approaches are being examined carefully to ensure that the best methods will be used to eradicate rats from Aleipata islands. As with all other modern approaches to a problem there are no short cuts and no single solution to resolve it. No piper with a magic chant to blow away our blues. We have to rely on good science and proven experience, hence is the painstaking trials that were started from last year, and may well continue through this year until the most effective means are applied to free Nu'utele, Nu'ulua, Namu'a, and Fanuatapu islands of rats for all times.

# Childrens Corner



- 1) There are \_ small islands off Aleipata coast.  
[a] 1  
[b] 2  
[c] 3  
[d] 4
- 2) Aleipata island rank \_ in conservation value in a 1986 ranking of Pacific islands  
[a] 10  
[b] 20  
[c] 30  
[d] 40
- 3) The best way to deal with rats in a small island is to  
[a] control their numbers  
[b] introduce cats to catch them  
[c] eradicate them  
[d] transport them to a big island
- 4) Which agriculture crop was severely affected by rats in Samoa?  
[a] taro  
[b] banana  
[c] cocoa  
[d] coffee
- 5) Which of the following terms does not relate to rats?

- [a] rodent
- [b] mice
- [c] mouse
- [d] miles

- 6) Why is it important to wipe off rats from Aleipata islands so important?
- [a] contain major nesting areas for sea turtles
  - [b] more seabirds live and breed there
  - [c] rats are destroying their biodiversity
  - [d] rats can not live anywhere except in those islands
- 7) Besides eating plants and attacking animals what are other problems with rats?
- [a] destroy bird nests
  - [b] spread diseases
  - [c] attack humans
  - [d] can live anywhere
- 8) Which of the following chemicals are usually used to kill rats?
- [a] DDT
  - [b] parafin
  - [c] warfarin
  - [d] benzene
- 9) The term for chemicals to kill rats is:
- [a] rodenticides
  - [b] pesticides
  - [c] insecticides
  - [d] weedicides
- 10) Which of the following animals does not prey on rats:
- [a] owl
  - [b] cat
  - [c] pigeon
  - [d] snake (boa)

# Word Find

Find the following words

Nuutele  
Rattus exulans  
Eradication  
Landbird  
Rats

Nuulua  
Nesting  
Extinction  
Avifauna  
Toxic

Fanuatapu  
Namua  
Poison  
Rattus rattus  
Dose

N	A	S	N	A	L	U	X	E	S	U	T	T	A	R
D	U	C	B	P	Y	G	H	B	V	X	G	R	T	S
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U U T T J A P Q W S P F S B I  
T I O Y S L W I Y I C H V I O  
T E X T I N C T I O N C J R N  
A R I T S E L T T P R B U D K  
R J C M I R U P A T A U N A F