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## Pacific Invasives Initiative

This summary of invasive species management activities by people and agencies that the Pacific Invasives Initiative (PII) works with is collated and circulated by the PII Team. Contributions are welcome. Thanks to all those who contributed to this one! Feedback is also welcomed – contact either the PII Team [PII@auckland.ac.nz](mailto:PII@auckland.ac.nz) or the people directly involved in projects. Visit our website <http://www.issg.org/cii/PII> or find us on Facebook for further information.

## PII ACTIVITIES

### **PII Resource Kit for rodent and cat eradication**—from Souad Boudjelas PII

PII has been preparing for the upcoming “How to eradicate rodents and cats” training course in Fiji in April. A training workshop was held to upskill the training team in delivery of the course. PII is delighted that Elenoa Seniloli, a Conservation Officer with Birdlife Fiji (see below), and Derek Brown a New Zealand eradication specialist will be part of the training team in Fiji.

### **SKILL SHARING: Restoration of Monuriki Island**—from Bill Nagle PII

A component of the [National Trust of the Fiji Island's](#) (NTF) project to conserve and restore the Fijian crested iguana (described below) is eradicating goats from Monuriki Island. The owner of the goats and the land-owning community of Yanuya support the project and have undertaken five months of mustering for live-capture by using village dogs and a large net positioned at different locations. The animals were taken to a buyer in Lautoka who will provide a boat for the goat owner in exchange for the goats.

As part of the support provided to NTF, PII organised and led a skill-sharing programme in New Zealand in December 2010 for Milika Ratu, NTF Project Officer. Milika presented the project to members of the NZDOC IEAG and discussed the feasibility of eradicating goats with them (see PII News, December 2010). The IEAG agreed with the findings of the feasibility study (see PII News, September 2010) and in January made recommendations to NTF about the use of professional hunters and trained dogs for the eradication.

As part of the skill-sharing, Milika visited [Ark in the Park](#), a community volunteer based project in the Waitakere Ranges Regional Park. The project is carried out by Forest and Bird and Auckland Council and has the support of local Maori iwi Kawerau a Maki. The area is a fence-less “Mainland Island” designed to restore functioning native ecosystems through intensive pest control and reintroduction of native animals and plants lost from the Waitakere Ranges.

The Park has endemic and native plants and animals, including translocations of birds from other sanctuaries. Translocated birds are fitted with a transmitter and an antenna and receiver

is used to track the birds so that nest sites can be protected from predators. Milika practiced with the telemetry equipment as this technique could be used to monitor translocated iguana after they have been released back into the wild.



**Milika Ratu using telemetry equipment with an Ark in the Park volunteer. (Photo: Bill Nagle)**

Much to Milika’s amazement, she discovered that most of the work in the Park (about 8,000 hours/year) is done by a wide range of volunteers from different communities living near the area. Volunteer activities include; clearing the walking trails, marking and setting up of traps for invasives such as cats, rats, stoats and possums, surveillance and monitoring outcomes.

The [Department of Conservation](#) regional office in Whangarei was visited on day four. A DOC team led by Glen Coulston (NZDOC and PII adviser) presented the goat control operations in Pukenui Forest, a 2,200ha area that belongs to the District Council. The presentation was followed by discussion with the DOC hunting team on the best time to carry out an eradication, field recording methods, use of GPS/GIS and databases.

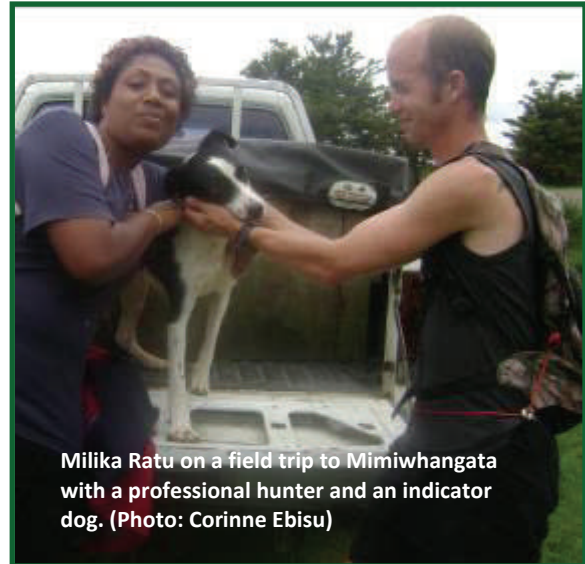
Milika then went out with the hunters to Mt Tiger/Pataua where 6000ha is under goat control. After nearly 2.5 hours of walking through the forest, six goats had been shot with the carcasses left to decompose to recycle nutrients back to the forest. The next day, Mimiwhangata (currently 1600ha being controlled but being built into a larger area of 6,000ha) was visited with a hunter and trained indicator dog and Milika was able to see the close teamwork between hunter and dog. The indicator dog was only interested in smelling out goats for the hunter to shoot.

Among the lessons learned from the PII skill sharing programme, Milika listed the following:

- Proper planning and recording is critical.
- Networking and sharing of ideas and information is vital particularly with those who have expertise in the field.
- Know your species; population, habitat, ecology, breeding season, life history, best time to carry out goat eradication, weather effects, etc.
- Record GPS data with a template ready to download to GIS systems.
- Hunters use different types of dogs and firearms for eradicating goats depending on the situation.
- Ongoing consultation with the communities you work with is critical and they should be kept advised of the processes.

- Monitoring and evaluating is critical to any project. Changes are visible in terms of island restoration; increase in numbers of endemic and native plants and animals.
- As part of the monitoring on Monuriki, photos should be taken at the photopoint positions set up during the feasibility study visit on every visit to the island

PII would like to thank the following for their cooperation and assistance: Keith Broome and DOC IEAG members; Ark in the Park volun-



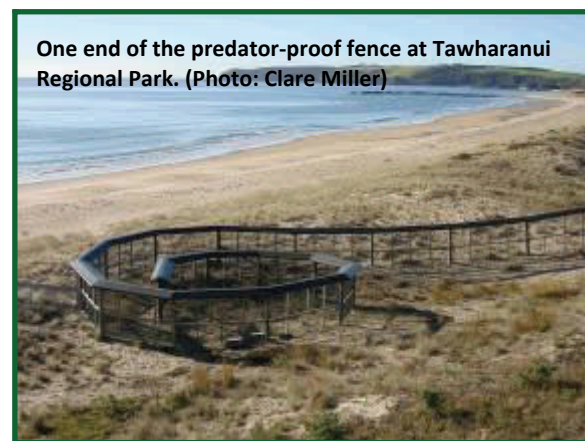
Milika Ratu on a field trip to Mimiwhangata with a professional hunter and an indicator dog. (Photo: Corinne Ebisu)

## SKILLS SHARING: Conservation of Tahiti and Fatu Hiva monarchs—from Marleen Baling PII

The PII Skill Sharing Programme for 2011 started off when Laurent Yan, a field technician from the [Ornithological Society of French Polynesia](#) (Manu), visited New Zealand to learn more about control operations for rats and cats. Manu identified this need for the protection and restoration of the Tahiti and Fatu Hiva monarchs (*Pomarea nigra* and *P. whitneyi*) as predators in the management area have to be controlled because eradication is not feasible. Laurent's 3-week trip in January was successful and he said that he learned much from his New Zealand visit about predator control, surveillance and biosecurity and on his field sites he has already started implementing some of the knowledge he gained from the PII Skills Sharing Programme.

PII worked with Tim Lovegrove of the Auckland Council to select two field sites, Tawharanui and Hunua Ranges Regional Parks, to best meet Manu's training requirements. Matt Maitland, the Auckland Council Open Sanctuary Coordinator, hosted Laurent at [Tawharanui Open Sanctuary](#) (TOS, a predator-proof fenced area) for two weeks. During this time, Laurent was able to discuss and experience both the principles of predator control and the restoration work following the control. TOS is frequently accessed by the community and has an agriculture and recreational component in the park; so several key issues are incorporated into the biosecurity work.

Laurent accompanied the TOS rangers on their routine surveillance and learned the daily logistics, safety procedures, and TOS's control grid/line designs and protocols for using kill-traps, toxic bait stations and tracking tunnels (targeting at least 10 introduced mammal species). He was also able to observe the interaction and collaboration between TOS staff, community volunteers and scientific researchers at the park.



One end of the predator-proof fence at Tawharanui Regional Park. (Photo: Clare Miller)

In addition to the predator control work, PII ensured that Laurent was given the opportunity to take part in several wildlife monitoring activities at TOS. These included a survey for tui (*Prosthemadera novaeseelandiae*) nests (with Massey University); survey for self-reintroduced grey-faced petrel (*Pterodroma gouldi*) (with TOS volunteers); nest monitoring for the translocated North Island robin (*Petroica australis longipes*) and radio-tracking translocated pateke (*Anas chlorotis*) (with NZ Department of Conservation).

In the [Hunua Ranges](#), one of Auckland's largest forested landscapes, Laurent worked with Rosemary Gatland, who maintains the predator control lines in the Kokako Management Area (KMA) for the endangered North Island kokako (*Callaeas cinerea*). Hazel Speed, who works on the [Kokako Project](#) for the Department of Conservation (DOC), explained DOC's coordination of the conservation



and restoration of the species throughout New Zealand and the management approach in the Hunua Ranges. Rosemary explained the logistics and practicality of setting station lines in steep, forested areas similar to the monarch management areas in Tahiti and Fatu Hiva. Several days were then spent checking and maintaining trap and bait station lines in the KMA to give Laurent an idea of the routine safety and monitoring protocols in New Zealand dense, damp forested sites.

In between his fieldwork, Laurent updated PII on the monarch project, and continued discussions on Manu's invasive species management concerns with possible options to address the issues. PII also arranged for Laurent to give a presentation about Manu's projects at the University of Auckland. The talk was attended by conservationists from the Biodiversity, Biosecurity and Conservation Research Group of the University of Auckland, the New Zealand Forest and Bird Society, and the [Ornithological Society of New Zealand](#) (see p4 of OSNZ Auckland Region February newsletter). Feedback from the audience was very positive and they were very interested to learn about avian conservation projects in French Polynesia.

*PII would like to thank the Auckland Council and Department of Conservation staff for generously giving their time to meet and ac-*

*commodate a participant of PII Skill Exchange Programme at their field sites. PII's contribution to Laurent's visit was funded by NZAID. His visit was also funded by CEPF, Forest & Bird with a David Gordon's Fund, French Polynesia Government and BirdLife International with a Prins Bernhard Natuurfund.*



A trap used in the predator control programme in the Hunua Ranges Regional Park. (Photo: Bill Nagle)

## PROJECT UPDATES

### **FII:** Restoration and conservation of the Fijian crested iguana—from Elizabeth Erasito, Director, National Trust of the Fiji Islands

As part of the work to save the rapidly declining southern-most populations of the Fijian crested iguana (*Brachylophus vitiensis*), the [National Trust of Fiji Islands](#) (NTF), local landowners Mataqali Vunavi and Kula Environmental Centre signed a Memorandum of Understanding (MOU) in 2010 that included;

- Capture of 10 males and 10 female iguanas from Monuriki for captive breeding on [Kula Eco Park](#).
- Removal of goats and other unwanted species from the island.
- Restoration of the endangered tropical dry forest vegetation.

The Yanuya community fully support the iguana conservation work of NTF. A total of 17 wild-caught Monuriki crested iguanas (8 females and 9 males) have been housed at Kula Eco Park, in a custom built breeding facility away from public access. Five eggs were laid on 28<sup>th</sup> of April 2010. Kula Eco Park was very proud to have 100% hatching success of all five eggs in December. One newborn iguana was lost two weeks after hatching whilst the remaining four are doing very well. All hatchling iguanas were examined by Dr. Peter Harlow, Taronga Zoo and Dr. Robert Fisher, USGS.



Fijian crested iguana. (Photo: Marleen Baling)

In addition to collecting crested iguanas for the captive breeding program, NTF have worked closely with the local landowners and PII to remove goats from Monuriki. Goats are one of the major threats to crested iguanas on the island as they eat iguana food, crush their eggs, cause soil erosion and degrade the island vegetation. Community mustering efforts in 2010 have seen 150 goats removed from the island. PII assisted NTF in determining whether the eradication of goat on Monuriki would be feasible. The feasibility proved positive and the final stages of the goat eradication are planned for 2011.

NTF staff visit Monuriki Island landowners (based at Yanuya Island) every 6 months to provide progress updates on the project to the community. Partnership efforts provided by the Nadroga/Navosa Provincial Office, BirdLife International and PII have been important in supporting NTF's role and enabling us to meet the challenges of this project and effect success.



Taukei Yanuya signing the MOU with NTF. (Photo: Bill Nagle)

## FRENCH POLYNESIA: Update on the Polynesian Ground dove conservation programme—from Guillaume Albar, Ornithological Society of French Polynesia

The Polynesian ground-dove (PGD), *Gallicolumba erythroptera*, is critically endangered (IUCN Red List CR), with no more than 120 individuals distributed across four islands of French Polynesia. Rats, and to a lesser extent cats, pigs and dogs are considered as major threats for the species.

As part of the PGD conservation programme, an [Ornithological Society of French Polynesia](#) (Manu) team recently undertook a field trip to the atoll of Rangiroa. Nine PGDs were counted, which is considered low but stable compared to previous field trips. Three of the nine birds were unbanded so these were caught and colour-banded to enable Manu to keep track of individual movements and population demography.

This field trip also detected the presence of rats on two previously rat-free islets in the atoll. The islet east of the first two was also re-invaded in 2009 (all three islets underwent rat eradication in 2008). These events confirmed that the islets in this zone are too connected to one other to allow a step-by-step rat eradication approach. Therefore Manu is now considering rat eradications at islets at the western part of the atoll that would offer more suitable habitat to PGDs.

During their stay, the Manu team made presentations at the primary and the junior high schools at Rangiroa to ensure that the children are aware of their rich avifauna. This included information

on the species present on the island (including PGDs), the bird's biology and ecology, the different threats and methods of protecting them. Manu's team leader was also interviewed on a local radio to talk about PGDs and the conservation actions undertaken for the species on Rangiroa so far. The interview was translated into *Pau-motu* (Tuamotu's local language).

Another field trip to three islands in Morane is scheduled within the next few months. This trip will determine the PGD population status at this remote, uninhabited atoll, and also provide an opportunity to assess the situation of another species of interest, the endangered (IUCN Red List EN) Tuamotu Sandpiper *Prosobonia cancellata*.

Concurrently, Manu is developing a Species Action Plan to identify conservation actions for PGD over the next five years. A first draft has been reviewed by Mark O'Brien (BirdLife Pacific) and Manu is currently adapting the Plan accordingly. A Steering Group is also being set up and will contribute to Species Action Plan.

PII is playing an important role in Manu's work by providing skill sharing opportunities for Manu staff. The PGD conservation programme manager will receive training in rat and cat eradication planning in Fiji in April.

*Manu would like to thank the French Polynesia Government, CEPF and the US Fish and Wildlife Service for financing this programme.*

## FRENCH POLYNESIA: Regional cooperation for bird conservation programmes—from Anne Gouni, Executive and Programme Director for the Ornithological Society of French Polynesia

An opportunity to re-assess the management of Manu's projects, especially the restoration programmes for the islets of Gambier Archipelago (Manui, Makaroa and Kamaka) and the Vahanga Atoll, was provided when Anne Gouni, Executive and Programmes Director of the [Ornithological Society of French Polynesia](#) (Manu), travelled to New-Zealand and Fiji in October 2010. Anne benefitted from a PII skill-sharing programme and, along with the partners of Manu, discussion on the conservation programmes for the birds of French Polynesia (see PII News, December 2010).

The three islets of Gambier Archipelago are very small (approximately 70 hectares in total). Kamaka and Makaroa have Polynesian rat, *Rattus exulans*, and Manui has rabbits (*Oryctolagus cuniculus*). There is also a small population of goats (*Capra hircus*) on Makaroa. Only one (Kamaka) of the three islets is inhabited, by only one person. The native birds of significance on these islets (and their IUCN Red List status) are; Murphy's petrel *Pterodroma ultima* (NT), Herald petrel *Pterodroma heraldica* (LC), wedge-tailed shearwater *Puffinus pacificus* (LC), Christmas Island shearwater *Puffinus nativitatis* (LC) or Audubon's shearwater *Puffinus lherminieri* (LC).

Vahanga Atoll has an area of 400 hectares and has been considered as a potential habitat site for the Polynesian ground-dove *Gallicolumba erythroptera* (CR) and Tuamotu Sandpiper *Prosobonia cancellata* (EN); both are found in Tenararo Atoll (7 km from Vahanga and a mammal-free site). There is also Murphy's petrel, bristle-thighed curlew *Numenius tahitiensis* (VU), Atoll fruit-dove *Ptilinopus coralensis* (NT) and Tuamotu reed-warbler *Acrocephalus atypus* (LC). Abandoned coconut plantation dominates much of the island although a few small remnants of unmodified vegetation, largely pandanus and mikimiki, remain. There is only one invasive mammal, the Polynesian rat and approximately two hectares of *Lantana camara*, an invasive plant, at the atoll.

The eradication of invasive species from these sites will benefit not only the biodiversity but also the local communities. Indeed, there is an opportunity for the communities to play an active part in the conservation programmes and apply biosecurity measures once the sites in this part of French Polynesia (Tenararo, Morane, Vahanga, islets of Gambier Archipelago) are rat-free sites.

During the trip to Fiji and New Zealand, Anne explored the possibilities of lowering the costs of and technical cooperation for the projects for 2011 by sharing logistical and technical capacities with three other island restoration projects in the Pacific (Palmyra, Phoenix and Henderson). This initiative to coordinate Manu's projects with other region's restoration projects came about after the proposal from different experts ([BirdLife International](#) (BLI), PII, New Zealand [Department of Conservation](#) (DOC)) to use aerial techniques to spread the toxic bait. The important part of this project is the organisation and logistics in obtaining administrative authorisations for boats and helicopters to enter and work in the French Territory.

The next mission for Anne Gouni (who drives the Vahanga project and coordinates the two projects) and Julie Champeau (who drives the Gambier project) is to work through the planning for the eradications with the NZDOC Island Eradication Advisory Group (IEAG) at the April 2011 meeting in New Zealand.

*Manu would like to thank PII, BLI, Keith Brome (NZDOC), Derek Brown (NZ Eradication Consultant), Monique Richeton (Mayor, Managerava district), John Reasin, Father Joël Aumeran and the local communities for their help. Manu also wants to thank all donors who have supported these projects; David and Lucile Packard Foundation, French Polynesia Government, Te Me Um, French Government, Critical Ecosystem Partnership Fund, European Union.*



## REGIONAL INTEREST

### King Myna

Professor Chris Feare, one of the world's leading researchers on invasive and pest birds, is looking for information on common mynas with totally bald, bright yellow, heads. He came across them occasionally while working in the Seychelles Islands. They are well known there and are called "king mynas". He has found a number of pictures of them on the internet but no significant information. As there is no mention of them in standard texts he has access to, he has asked for information on where else they have been recorded and, if possible, suggestions of publications where he might find information. He will be grateful for any help and can be contacted through PII ([PII@auckland.ac.nz](mailto:PII@auckland.ac.nz)).



A distinctive "king" myna in the Seychelles. (Photo: Chris Feare)

### Climate change and invasive species

Is there a climate change component to your invasive species management project? If so, send the story to the Climate & Biodiversity Nexus ([CB Nex](#)) team. Their first goal for the year is to "Showcase the story of 2,000 climate change projects and initiatives in 100 days" And they want to showcase your work on CB Nex. Learn more about [your role in this goal](#) and the benefits for you and the climate change community!

## EXPERT OPINION

### Following on from the article on rat surveillance in our last newsletter, we look at cheap methods for determining the presence or absence of rats and cats - compiled by Marleen Baling PII

In a perfect world, you will have enough project funding to buy the best equipment for all your monitoring and surveillance needs. But in reality, you're lucky to get enough material to last until the next funding round for your project! So how do you make the best of what you have and not compromise the success of your project? In this issue we focus on two cheap (home-made) surveillance methods; chew blocks and footprints/tracks.

Thanks to Araceli Samaniego (The University of Auckland), Weihong Ji (Massey University) and Fin Buchanan (Department of Conservation) for the information kindly contributed for this article.

Send us your version of a cheap/simple surveillance method (with photos) that worked best for you.

**Chew blocks** can show rat (*Rattus* sp.) presence from tooth marks on the blocks. Wax blocks or 'tags' are the most common and are cheap and easy to produce! Their high attractiveness has been tested with several rodent species and in all kinds of habitat types and climates. Minimum training is needed to distinguish between rodent bites and other animal marks. If used in a systematic way before and after control or eradication programs, they can be a very useful rodent indicator.

Paraffin wax is melted and mixed with peanut butter or coconut (either liquid or grated), then poured into baking trays with some oats/cereal at the bottom. Different tray shapes sizes can be used depending on type and abundance of potential chewers. When hardened, the tags can be put out in the field and may last several days if placed under shade. Keeping the tags off the ground may

minimise interference where land crabs are abundant and also reduces consumption by insects. This can be done by simply nailing them on tree trunks, however some land crabs are really good climbers and there are not always trees in the right place.



Nailing wax tags on trees is the most common technique but some land crabs are good climbers. (Photo: Alex Wegmann)

**Presence or absence of rats and cats** Continued from page 5

PVC tubes buried a few centimeters and filled up with local soil are an alternative for these situations (see photograph). Wax tags are placed on top and a flag through the middle of the tag serves three purposes: it stops the whole tag from being taken away; it helps to locate the spot from a distance; it provides for naming or numbering the station. A tube height of 10 cm is enough to exclude hermit crabs and small land crabs, but that depends on the size of the land crabs so preliminary testing is recommended.



Hermit crabs attracted to a wax tag (L) and use of PVC pipes to keep hermit and small land crabs away from the wax tag (R). The flag has several purposes (see text). (Photos: Araceli Samaniego (L) and José M. Barredo (R))



Chewed waxed blocks (Photo: Araceli Samaniego)

All monitoring stations should be checked daily, and tags replaced if necessary. Minor scratches or bites can be “erased” with a knife, and after the monitoring all tags can be re-melted and reused. Fresh tags stored in dry and cool conditions may last for over a year.

Unscented soap blocks (e.g. Sunlight) wired down to stop rats taking them away have been also used (but must be kept dry) as teeth marks show up. Other cheap chew block types to consider are dry coconut pieces (in areas of low crab densities) and oiled wood (see: Ji W, Veitch CR and Craig JL 1999. *An evaluation of the efficiency of rodent trapping methods: The effect of trap arrangement, cover type and bait*. New Zealand Journal of Ecology 23(1): 45-51.).



Suspending wax tags by string (circled) to avoid crabs. (Photo: Ray Pierce)

**Footprints/tracks** in dust, mud, sand or snow are probably the oldest and most widely-used method of determining animal presence. Inked tracking-tunnel cards are superior in producing identifiable footprints of small animals and they also provide a standard measure for monitoring purposes. But where tracking-tunnels are not an option, the use of sand-pads may be an option. Sand-pads are generally used for detecting large mammals like cats (*Felis catus*) and are set up along known/well-used soft-ground (e.g. sand) tracks. Smooth out an area (width equal to the track and at least 1m in length) to create the sand-pad. The sand-pads are checked either early morning or late afternoon for any footprints. The pads can be easily re-set by smoothing all prints after every check. This method is best used in dry conditions.



Sand-pad setup on Rangitoto Island, New Zealand. (Photo: Alejandra Torres)



## Transferring rodent eradication success from temperate regions into the tropical Pacific—what do we need to learn? - From Keith Broome, Department of Conservation, New Zealand

### Introduction

Most of the world's biodiversity is found in the tropics and islands hold many species not found elsewhere. Introduced rodents on islands are well recognised as having harmful and sometimes devastating effects on the native fauna of islands. The problems caused by rodents on islands are not restricted to tropical islands, many extinctions are also known from temperate regions. Over the last 25 years techniques for eradicating rodents using poison baits have been developed in New Zealand and other countries to a point where very large islands are now being attempted.

Use of this rodent eradication technology in tropical regions is increasing as more tropical island nations recognise the issue of rats on islands and access funds to allow them to tackle the problem.



**Aerial baiting on the Aleipata Islands, Samoa. (Photo: Alan Tye)**

However, transferring the technology from temperate to tropical regions with social, cultural and ecological differences needs careful consideration. Here I look at some of the issues which are different and how information sharing can lead to progress.

What do I consider the key topics for tropical eradications needing further study?

1. Achieving eradication on islands with high crab densities
2. Rats living only in the canopy of coconut palms
3. Alternative foods available for rats
4. Non-target effects and other surprises
5. Sustainable biosecurity measures that work

I'll tell you what I know about each issue, which will hopefully encourage others to correct me and share their knowledge on each subject.

### What do we know and what do we need to know?

#### 1. Crabs

##### What's the issue?

Land crabs are a feature of many tropical islands and these invertebrates appear to be both highly attracted to rat baits currently in use and completely unaffected by anticoagulant poisons. This leads to potential risks of failing to eradicate rodents because the crabs "stole" the bait before the rats could eat it.

##### What do we know?

Firstly, most biologists involved in rodent eradications either have expertise in small mammals or birds but few are experts in marine

environments or crab ecology so there is scope for inviting help from our marine science colleagues and learning from the traditional knowledge of island inhabitants. PII has done a useful review of the issue and identified the crab species of most interest ([Wegmann 2008](#)). Many people have experimented with bait stations which reduce crab take of bait although, as the design of these becomes more effective against crabs, perhaps the risk of stopping rodents from entering bait stations increases also. Another approach using broadcast baiting is to satiate the crabs by applying more bait than they can take away, thereby leaving enough for the target rats to consume. This approach requires judgement of two fundamental parameters:

- How many crabs are there? (and what species?)
- How much bait to apply?

The PII review summarises our collective state of knowledge as at 2008 and to this can be added a small number of additional data. What stands out is the number of attempts already made on crab infested islands where one or more of the parameters were not measured or reported and for those that were, the number of different methods used to calculate crab densities.

##### What do we need to know?

If we are to learn about this issue from eradication attempts, a common method for measuring crab densities together with good reporting of bait application rates and the final result of the eradication is required. The excellent [PII Eradication Resource Kit](#) is a place for people to access a crab measuring guideline and the [Island Conservation vertebrate eradication database](#) could be the common repository for reporting on eradication projects and the [ISSG Global Invasive Species Database](#) for Management Information.



**Crab attempting to access food in rodent live-capture trap nailed to tree. (Photo: Bill Nagle)**

#### 2. Tree dwelling rats

##### What's the issue?

Ship rats (*Rattus rattus*) are excellent climbers and are often seen in the crowns of coconut palms. There is concern among some eradication practitioners that it may be possible for rats to live exclusively in this habitat and never or seldom come down to the ground to feed. This could be a problem for bait broadcast by ground based methods or in bait stations, particularly when coupled with high crab densities (see above) which only allow bait to remain on the ground for a short time. Aerially applied bait is likely to be caught in the crowns of coconut palms and therefore made available.

## Transferring rodent eradication success Continued from page 7

### What do we know?

This is not an issue encountered in the sometimes dense rainforest on NZ islands although the number of ship rat eradications done using ground based techniques in these habitats is quite small. A few rats were caught in the canopy of a coconut forest on Palmyra Atoll and fitted with radio transmitters. They were all found to visit the ground at some time but some remained in the canopy for several days (Howald *et al.* 2004). One mitigation method used successfully was to connect baits with a short piece of string and throw these up into the canopy of palms. Such mitigation becomes quite time consuming if the island is large and covered in coconut palms.

### What do we need to know?

Further telemetry studies would improve the sample size but a true test of this issue is to attempt ground based eradications of ship rats in coconut forested islands using best practice techniques but without any canopy baiting and report on the results. These results could then be compared with other attempts where specific canopy baiting mitigation measures were taken. In all cases, crab surveys would be essential.



Preparing baits to be thrown into tree canopies.  
(Photo: Natasha Doherty)

### **3. Alternative foods available for rats**

#### What's the issue?

Temperate islands tend to have strong seasonal effects in their habitat such as the timing of forest fruit and breeding seasons for birds. This seasonality is often reflected in rat population dynamics with low populations in winter and little if any rat breeding until spring. Tropical islands by contrast, despite wet and dry seasons, may have abundant rodent food sources all year round and breeding may occur in every month of the year. In these conditions there is always a question around whether all rats will eat the bait or will some prefer to continue with their 'natural' food supply and thereby survive the eradication attempt?

#### What do we know?

We currently have a mixed bag of success and failure on tropical islands but often the failures could have been attributed to any one of a number of reasons including alternative food supplies or less than perfect baiting practices. I know of only one small island in French Polynesia where most of those alternative explanations for

failure can almost be ruled out to leave alternative food as a strong option for cause of failure (in this case it was the breeding of sooty terns on the island during the time of baiting).

#### What do we need to know?

More eradication projects which have good reporting on the conditions prevailing at the time of the implementation and which can demonstrate that best practice was followed throughout the project will greatly improve our learning from both successes and failures.

### **4. Non-target effects and other surprises**

#### What's the issue?

The toxic baits used for rodent eradications have reasonably well understood environmental effects in temperate regions through a long history of use coupled with monitoring or mitigation for non-target species of concern. In tropical regions this knowledge base is growing but it's hampered by the isolation of many islands treated thus far. Extending monitoring beyond the timeframe of the implementation of the eradication is often very costly for isolated islands requiring long distance travel to get there. It's important that we all learn from the experience of exposing new species to eradication methods currently in use so that risks can be understood and we develop mitigation measures that work.

#### What do we know?

We know what effects rats are having on tropical island ecosystems which gives us a good benchmark of 'benefit' from an eradication against which to evaluate the 'cost' of non-target deaths of some species. We also know that each island is different and that there is no substitute for careful inventory of what is living on the island that may be at risk and follow up evaluation of that risk on a case by case basis.

#### What do we need to know?

Longer term monitoring of the ecological changes brought about through an eradication would enhance our knowledge in two key ways: Firstly it would give us further information about how rats may have been affecting the system and what happens when they are removed, and secondly it would give us a better long term context in which to consider the short term cost of non-target risks. In order to maximise the value of such monitoring it must be reported and made publicly available.

### **5. Sustainable biosecurity measures that work**

#### What's the issue?

Fundamental to achieving eradication on an island is the ability to manage reinvasion. This aspect requires thorough evaluation during the feasibility study phase of a project. Management techniques used in temperate regions and predominantly western societies may not be the best approach for tropical islands with different cultures and different biosecurity risks.

#### What do we know?

Achieving successful biosecurity to manage reinvasion of rodents on an island is a mix of practicalities and social change in the way people visiting or living on the island view the potential consequences of their actions.



## Transferring rodent eradication success

Continued from page 8

### What do we need to know?

We need to know what works and what does not. Sharing experiences among people involved in island biosecurity is important to developing ways of achieving the goal which are both practical to undertake and respect the local culture.



Crew on the sailing canoe *Gualofa* wash fresh food in seawater as part of their biosecurity protocol during the voyage. (Photo: James Atherton)

### Summary

Common to all these issues is:

1. good practice in undertaking eradications,
2. good monitoring of results and outcomes and
3. good reporting on the whole project.

There are now mechanisms available to guide all three in the [PII Eradication Resource Kit](#) and there has long been forums for sharing information generated by projects such as learning networks (such as [PILN](#)); newsletters and websites such as [PII](#) or [islandNet](#); or global databases such as the [Island Conservation vertebrate eradication database](#) or the [ISSG Global Invasive Species Database](#) for Management Information.

## PACIFIC PRACTITIONER PROFILE

This is a series in which PII acknowledges the contribution of individual practitioners to invasive species management in the Pacific. This article is from Souad Boudjelas (PII).

Elenoa Seniloli is passionate about seabird conservation and community participation in conservation and is a leading invasive species eradication practitioner with a principal role in BirdLife International's Fiji Programme. In the five years PII has been working with Elenoa, she has grown in knowledge, skills and confidence and has, since her involvement in the Pacific rat eradication on Vatu-i-Ra Island, been leading the planning of eradication projects, leading feasibility study teams, writing project and operational plans and reporting on outcomes.

Elenoa completed a Bachelor of Science (in Biology and Chemistry) from the University of the South Pacific (USP) and followed it up with a Postgraduate Diploma in Environmental Biology, also from USP. As a Conservation Officer with the BirdLife International Fiji Programme, she works to restore internationally important seabird islands in Fiji as part of a project funded by the David and Lucile

I think it's time for everyone involved in rodent eradication projects on tropical islands to help themselves by using these excellent resources to the benefit of all. My plea to you is to report on both your successes and your failures so that we all may learn.

**NOTE:** Any comments on this article or questions or information for Keith can be sent to [PII@auckland.ac.nz](mailto:PII@auckland.ac.nz)

### References:

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Sharing the success of a rat eradication in Fiji at a rodent eradication symposium in Pohnpei, Federated States of Micronesia. (Photo: Bill Nagle)

Packard Foundation. Elenoa enjoys working with the BirdLife International Fiji Programme team namely, Steve Cranwell, Tuverea Tuamotou and Sialesi (Sia) Rasaloto who make working out in the field on remote islands much easier and fun.

She regards the Vatu-i-Ra project as a confidence booster for her as an individual and also for her organisation, as it showed that, with proper planning, consultation and advice, eradication is possible on islands. That success enabled BirdLife to get more funding and develop the Seabird programme.

Successful eradication projects on Mabualau Island in the Tailevu Province and seven islands in the Ringgold Group, Northern District have seen Elenoa's footprint. Tasks associated with her work include: community consultation; building relationships with project partners; planning, organising and implementing project activities, including monitoring and surveillance; preparing and submitting project reports; supporting educational and training activities for conservation professionals and community members.

**PACIFIC PRACTITIONER PROFILE** Continued from page 9

Although she often has to put up with discomforts such as camping out on isolated, often uninhabited, islands and being the only woman on most of the trips, Elenoa is always ready to adapt and make the most of the situation. She says that visiting restored sites (Vatu-i-Ra Mabualau and Ringgolds) on monitoring and surveillance trips and noticing positive changes on vegetation, skink activity and seabirds makes all the discomfort worthwhile.

Elenoa has participated in several PII training events and says that PII was a “lifesaver” for the Fiji projects in 2006 when there were no advisers in eradication matters. She regards the ongoing support of PII as crucial to her projects. Many technical issues/questions need to be addressed as the projects increase in size and complexity and PII has been “helpful throughout”. She also uses PII’s network of experts, practitioners and scientists to assist with her projects.

Elenoa said that the amount of time invested in the planning and operation of Mabualau Island led to a “great outcome” and was valuable. She said it is “always an achievement to see plans which you’ve spent months on unfolding right in front of your eyes” and that having a well thought out plan is crucial for any project. Of the many lessons she has learnt from her work, Elenoa said that community consultation and being respectful and following the social

and cultural customs of the area is “crucial” for any project even though it may be at times very challenging. She said she has developed a positive mental attitude and has learned to see solutions, not problems so if issues arise in a project she always looks for the solutions.



**Elenoa Seniloli explains the Mabualau project to PII and PILN Partners. (Photo: Souad Boudjelas)**

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