



# PII NEWS

SEPTEMBER 2012

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) or the people directly involved in projects. The views expressed by authors are not necessarily those of PII. Visit our website or find us on Facebook for more information.

## WHAT'S INSIDE

### PII ACTIVITIES

Island Biosecurity Training	1
BirdLife TAG meeting	2
IEAG Meeting	2
Feasibility Study in Tahiti	3
Feasibility Study in Kosrae	4
Invasive Bird Training	5
Invasives & International Trade	6
Other Technical Support	6
Invasives at the PIF Meeting	7
Invasives in Melanesia	7

### PROJECT UPDATES

Samoa: Mt Vaea	8
----------------	---

### REGIONAL UPDATES

Hawai'i	9
Guam	10
Mexico	11

## Professor Randy Thaman recognised for his outstanding services to the conservation of nature and natural resources at the 2012 IUCN World Conservation Congress, Jeju, Korea

Congratulations to Professor Randy Thaman who was awarded Honorary Membership of the IUCN at 2012 IUCN World Conservation Congress IUCN in Jeju, Korea. Professor Thaman has been with the University of the South Pacific (USP) since 1974 where he teaches Pacific Island Biogeography. Over the years Professor Thaman has inspired countless students to become conservationists; many of whom now hold important positions within government and non-government organisations in the region. He is also a strong supporter of invasive species management and is an active member of the Pacific Invasive Partnership (PIP).

## PII ACTIVITIES

### Island Biosecurity Training, 26–28 September 2012, Suva Fiji

From 26th to 28th September, PII ran a 3-day Island Biosecurity Training Course in Suva, Fiji following a request from BirdLife Pacific on behalf of their partners (i.e. Société Calédonienne d'Ornithologie; NatureFiji-MareqetiViti; Palau Conservation Society; and Te Ipukerea Society, Cook Islands). Participating in the training were staff from the above NGOs, the National Trust of Fiji, Biosecurity Authority of Fiji, Secretariat of the Pacific Community, Secretariat of the Pacific Regional Environment Programme, BirdLife Fiji Programme and BirdLife Pacific Secretariat.

The purpose of the training was to enable effective planning and implementation of biosecurity for islands.

The training course introduced participants to the PII Resource Kit for Rodent and Cat Eradication and provided them an opportunity to enhance their understanding of the principles and practices underpinning island biosecurity. The learning outcomes were how to:



Participants and training team at the Island Biosecurity Training Course, 26-28 September 12, Fiji  
(Photo: Nick Askew)

1) assess risks, 2) plan and implement surveillance, 3) plan for and implement incursion responses, and 4) communicate about biosecurity at the national and community levels. The format of the course included presentations, group activities and discussions.

Participant feedback on the course was positive and it appears that the course outcomes have been achieved. Suggestions for refining the course included: increasing the duration, reducing presentations and increasing the number of practical sessions. We will use this feedback when refining the course.

PII facilitated inputs to the training from three experts in risk analysis, surveillance and incursion from the New Zealand Ministry of Primary Industries (MPI). PII would like to thank MPI for their valuable and generous support. PII is also grateful to The David and Lucile Packard Foundation for their support.



*Reviewing examples of awareness materials  
(Photo: Souad Boudjelas)*

## BirdLife Pacific Invasive Species Programme Technical Advisory Group 2nd Meeting, 24–25 September 2012, Suva, Fiji

As a member of the Technical Advisory Group for the BirdLife Pacific Invasive Species Programme, PII provided technical support and advice to the BirdLife Pacific partners, namely, Société Calédonienne d'Ornithologie; NatureFiji-MareqetiViti; Palau Conservation Society; and Te Ipukerea Society, Cook Islands.

Discussions centred around research needs and opportunities; programme outputs; monitoring and evaluation; how to use the results from the programme to generate further support for biosecurity and invasive species management at local, national and regional levels; and identifying and addressing capacity requirements of each partner. Also discussed, were ideas for an event on

island restoration at the upcoming BirdLife World Congress in June 2013 in Toronto, Canada.

The meeting was productive and enabled good discussion between all participants (i.e. projects managers and TAG members).

PII was delighted to receive very positive feedback on the Resource Kit for Rodent and Cat Eradication and the accompanying training. It was also pleased to receive requests for training in island biosecurity and ungulate control from some of the BirdLife partners.

## Island Eradication Advisory Group Meeting, 18 September 2012, Wellington, New Zealand

PII participated in a one-day meeting of the New Zealand Department of Conservation (NZDOC) Island Eradication Advisory Group (IEAG) on 18th September in Wellington, New Zealand. The IEAG is a group of experts that advise project managers on the planning and implementation of invasive mammal species eradications on islands. To date, the IEAG has provided significant and much valued input to several projects from the Pacific islands region. PII is very grateful to the IEAG for their continued support to us and our Pacific partners.

This time, in support of the Société d'Ornithologie de Polynésie (SOP-Manu), PII facilitated the review of the draft Operational Plan for the eradication of the Pacific rat (*Rattus exulens*) on Vahanga Atoll, Acteon Group, French Polynesia.

The eradication of Pacific rats on Vahanga Atoll will benefit threatened, or near-threatened, bird species currently present on the neighbouring Tenararo Atoll, such as the Pacific ground-dove (*Gallicolumba erythroptera*) (CR) and the Tuamotu sandpiper (*Prosobonia cancellata*) (EN). It will also provide a safe habitat for seasonal migrants and birds dispersing from Tenararo Atoll. Eradicating rats on Vahanga Atoll will also strengthen biosecurity for the neighbouring rat-free Tenararo Atoll native fauna and flora. PII has been assisting SOP-Manu on the planning of the eradication of Pacific rat on Vahanga Atoll since 2005. The eradication attempt on Vahanga Atoll is scheduled to begin in September 2013.

If you would like feedback on your project from the IEAG, please contact: Souad Boudjelas, PII Programme Manager ([s.boudjelas@auckland.ac.nz](mailto:s.boudjelas@auckland.ac.nz)).

## Protecting remnant native forest species the focus of a feasibility study: site visit, 25-31 August, 2012, Tahiti

PII has been asked by Te rau ati ati a tau e a hiti noa tu (also referred to as Te rau ati ati), a local Tahitian NGO, to complete a study to assess the feasibility of erecting an ungulate-proof fence to protect part of a 20 ha site of native forest within the Maraeti'a Plateau in the Punaruu Valley, Tahiti. In addition, the study will also be looking at the feasibility of controlling rats and invasive plants on the plateau and within the fenced area.

The Maraeti'a Plateau is between 750-800 m elevation and is characterised by unique remnants of native –almost pristine– mesic to wet forests containing the largest populations of the endangered forest species *Pouteria tahitensis* and *Ochrosia tahitensis*; important populations of *Polyscias tahitensis* and *Santalum insulare var insulare*; and also one specimen of the endangered and legally protected endemic plant *Zanthoxylum nadeaudii*.

The Punaruu Valley is the second largest watershed on Tahiti. It is 10 km long and has a surface area of 39.2 sq km. The valley rises from sea level to 800 m and contains several mid-elevation plateaus alongside the river.

The valley has huge cultural significance to Tahitian people. An annual orange gathering festival takes place each July when local people harvest fresh sweet oranges from established trees in the valley, including the Maraeti'a plateau. The orange gathering tradition has been the subject of a recent book "Les porteurs d'oranges, une tradition a Tahiti". There are many marae within the valley dating back to early Polynesian times.

Punaruu Valley's natural habitats are threatened by invasive plant species (*Tecoma stans*, *Psidium cattleianum*, *Coffea arabica*, *Spathodea campanulata*, *Miconia calvescens*), and animal species (the black rat (*Rattus rattus*) and the Pacific rat (*Rattus exulans*), the carnivorous snail (*Euglandina rosea*), the red vented Bulbul (*Pycnonotus cafer*) and the swamp-harrier (*Circus approximans*), the feral goat (*Capra hircus*) and the wild pig (*Sus scrofa*) are also in the mid and upper part of the valley. Wild pigs are shot or trapped during the pig hunting season in August and are a valued food source.

Pigs, rats and invasive plants are detrimentally affecting native vegetation in the valley where, there are now very few remaining specimens of some native and endemic plant species.

The site visit part of the feasibility study was undertaken from 25 to 31 August 2012 and involved a 4-day trek to the Maraeti'a

plateau to assess management options. Members of Te rau ati ati and the Association pour la protection de la vallee de Punaruu provided local knowledge and logistical support.

PII facilitated inputs from Andrew Styche of the New Zealand's Department of Conservation (NZDOC) on rodent control and invasive animal proof fencing. PII is grateful to the DOC for the generous in-kind contribution.

The site visit team was made up of Ravahere Taputuarai (Project Manager, Te rau ati ati), John Mather (PII), Andrew Styche (NZDOC), Arthur Medeiros, Andrea Buckman and Luke Mclean (the Auwahi and Leeward Haleakala Watershed Restoration Partnership, Hawaii), Jean Yves Meyer (Department of Research, French Polynesia), Paul Niva (Archaeologist, Tahiti) and was led by Noella Tutavae (President, Te rau ati ati).

PII congratulates Te rau ati ati for the productive site visit and the meeting with the community. Te rau ati ati received funding for this project from the Critical Ecosystem Partnership Fund (CEPF). PII's contribution to the project is also funded by CEPF.



Mature *Pouteria tahitensis* (syn. *Planchonella tahitensis*) (*Sapotaceae*) on the Maraeti'a plateau (Photo: John Mather)



The 20 hectare Maraeti'a plateau with remnant native forest in the foreground of the upper Punaruu valley. The jagged mountain to the left is Te tara o Mai'ao; to the right emerging from the clouds is Mount Aorai, the third highest mountain in Tahiti at 2066 m high (Photo: John Mather)

## Feasibility study for the management of selected invasive plants in the Olum Watershe, Kosrae

PII is completing a Feasibility Study for the Kosrae Conservation and Safety Organisation (KCSO) on the management of selected invasive plant species in the Olum Watershed in Kosrae. Kosrae is the easternmost State of the Federated States of Micronesia. It is a high volcanic island lying between Guam and Hawai'i at about 5 degrees north of the equator. It has an area of approximately 110 square kilometres and substantial areas of high quality upland forest.

KCSO is a local NGO working to ensure the preservation of the Kosrae Island resources for generations to come. It leads environmental programmes in the terrestrial, marine and education areas. The Feasibility Study is part of a wider project led by KCSO and titled "Protecting Kosrae's Upland Forest Project" for which they received funding from the Critical Ecosystem Partnership Fund (CEPF). Part of the Olum Watershed is located within the Kosrae upland forest, a Key Biodiversity Area as identified in the Ecosystem Profile for the Polynesia-Micronesia Biodiversity Hotspot.

KCSO specified a group of ten invasive plants (including, the bronze-leaved clerodendrum (*Clerodendrum quadriloculare*); Mile-a-minute (*Mikania micrantha*) and Siam weed (*Chromolaena odorata*)) that required assessment. The Feasibility Study prioritised an area of relatively undisturbed, rare lowland forest within the Olum watershed that could potentially become a formally protected area. The forest contains few invasive plants and is part of a water supply catchment for local communities. The area is historically important, containing a series of tunnels and relics dating back to Japanese occupation

during World War II. School groups visit to learn of the Kosraean forest, medicinal plants and history. An ecotourism venture also operates within the forest and wider watershed.

While undertaking the Feasibility Study, PII was alerted to other very low-incidence invasive plants such as water hyacinth (*Eichhornia crassipes*), lantana (*Lantana camara*) and Honolulu rose (*Clerodendrum chinense*). PII was also asked to provide management advice for these species.

The site visit was undertaken from 16th to 28th July. Andy George, Jacob Sanney and Dison Kephass from KCSO assisted with all aspects of the visit. Landowner Hamilton Phillip assisted with the visit to the proposed protection area and provided information on management of the forest and surrounding land to date. Jason Jack of the Department of Resources and Economic Affairs (DREA); Leon Sigrah and Eric Waguk of the Kosrae Island Management Authority (KIRMA) were very helpful in providing background information.

A community meeting was held at DREA on the 17th July to discuss the project's objectives and goals. This meeting provided further information including, the community's views on management tools such as the use of herbicides on Kosrae Island.

The Feasibility Study report is currently being peer reviewed and it hoped that it will help KCSO and other Kosraean agencies with prioritising invasive plant management, develop effective management techniques and protect areas of very high biodiversity value.



View from within the Olum watershed forest towards Malem municipality, Kosrae, Federated States of Micronesia (Photo: John Mather)



Jacob Sanney of the Kosrae Conservation and Safety Organisation with water hyacinth plants identified during the PII Feasibility Study on Kosrae (Photo: John Mather)

## Capacity building for invasive bird management in the Pacific - From Jamie Copsey, Durrell Wildlife Conservation Trust

Invasive birds are becoming recognised as a growing problem on Pacific islands, as well as islands globally. While their impacts may be less obvious than the extreme consequences of invasive rats or cats on islands, we are just beginning to appreciate that they can pose a significant threat to endemic wildlife as well as livelihoods on our islands.

One species which illustrates this growing concern is the common myna, *Acridotheres tristis*, and the jungle myna, *A. fuscus*. Both species are spreading across the Pacific region and are currently located in 12 Pacific Island Countries and Territories (PICTs) (Dhami and Nagle, 2009). The common myna, in particular, is being recognised as a threat to a growing number of endemic species, such as the endangered Tahitian flycatcher, *Pomarea nigra* (Blanvillain et al. 2003) and the Seychelles paradise flycatcher, *Tersiphone corvina* (Henriette & Laboudallon 2011).

In response to this looming threat, a number of countries across the Pacific and Indian Oceans have begun to implement plans to manage the species, with varying degrees of success. Until recently there has been little opportunity to pool the current global experience in managing these species and develop protocols to improve our effectiveness.

In 2012 the Durrell Wildlife Conservation Trust, in partnership with the PII and Landcare Research, initiated a one year CEPF-funded project to begin to build capacity in the Pacific for invasive bird management, with a particular focus on managing myna birds. The project consisted of three main stages:

1. Review of myna bird (and other invasive bird) management projects globally to identify lessons learnt and common themes
2. A training course to share experiences and develop skills in managing invasive bird management projects
3. Delivery of draft management plans for invasive bird problems within Pacific islands and island states

The review part of the project has been produced and will soon be circulated to anyone who is interested in finding out more about myna management projects to date (contact Jamie Copsey at [jamie.copsey@durrell.org](mailto:jamie.copsey@durrell.org) if you would like to receive an early copy).

In July this year a nine-day training course was held in Apia, Samoa, in collaboration with the Ministry of Natural Resources and Environment (MNRE) of the Government of Samoa with additional support from the Secretariat of the Pacific Regional



*Setting up myna magnet traps (Photo: Jamie Copsey)*



*Dissecting myna birds to determine sex (Photo: Jamie Copsey)*

Environment Programme (SPREP) and the Pacific Invasives Learn Network (PILN). Twenty participants from eight islands/island states attended the course that used the PII Project Process for Invasive Species Management on which to structure lectures, activities and discussions. Feedback from participants was excellent and five draft management plans began to take shape. These plans ranged from recommendations for eradicating myna birds on Tarawa Island, Kiribati through to preventing the further spread of myna birds from Fiji to other islands. While still very much in the review stage these plans do represent an important step in co-ordinating our actions across the Pacific to slow down the rate of spread of mynas and other invasive bird species.

Over the coming weeks we will be announcing a small seed grant which will be available for participants of the course. This will enable them to begin putting their plans into practice. We hope to report in a later edition of the newsletter on the progress made.

## International Trade and Invasive Species Seminar, 12–13 July 2012, Geneva, Switzerland

PII highlighted the importance of partnerships and capacity development in addressing the invasive species issue in the Pacific islands region at a seminar on “International Trade and Invasive Alien Species”. The seminar was organised by the Standard and Trade Development Facility (STDF) in collaboration with the International Plant Protection Convention (IPPC) Secretariat and the World Organisation for Animal Health (OIE) and was held from 12th to 13th July 2012 at the World Trade Organization in Geneva.

PII also highlighted its concern that biosecurity/quarantine systems in the region appear to be focussed on pests and diseases that affect agriculture sectors. These systems are not adequately addressing invasive species that can be a threat to native species and ecosystems. This means that we continue to see new invasive species threats spreading through the Pacific region.

PII has always strongly championed the strengthening of biosecurity at regional, national and inter-island levels. As part of this commitment, PII worked hard to establish the Pacific Ant Prevention Programme (PAPP) with its partners, especially the Secretariat of the Pacific Community (SPC), Biosecurity New Zealand (now the New Zealand Ministry for Primary Industries)

and the Secretariat of Pacific Regional Environment Programme (SPREP). Our commitment to biosecurity is also evidenced by our continuing efforts to strengthening the capacity for inter-island biosecurity in agencies that are actively engaged in invasive species management.

Following are a few important points from the seminar:

- The Agreement on the Application of Sanitary and Phytosanitary Measures or SPC Agreement covers invasive species introductions that are related to trade. Countries can regulate these species but measures to protect human life and health, animal life and health, plant life and health or other harm must be based on authoritative risk assessment.
- Currently there are no standards for invasive animals. OIE was asked to consider adding this to its mandate. OIE, for now, has developed guidelines for assessing the risk of non-native animals becoming invasive. The guidelines can be accessed at: ([www.oie.int/fileadmin/Home/eng/Our\\_scientific\\_expertise/docs/pdf/OIEGuidelines\\_NonNativeAnimals\\_2012.pdf](http://www.oie.int/fileadmin/Home/eng/Our_scientific_expertise/docs/pdf/OIEGuidelines_NonNativeAnimals_2012.pdf))
- The IPPC and OIE’s standards and guidelines are useful for the management invasive species. For information visit: [www.ippc.int](http://www.ippc.int) and [www.oie.int](http://www.oie.int)
- Those working on invasive species management should take into account existing national SPS capacity and infrastructure.

## Other Technical Support

- Cook Islands - **National Environment Service**: on-going support on the management of red passion fruit (*Passiflora rubra*) on the island of Mauke.
- Cook Islands - **Te Ipukerea Society**: Review of the Feasibility Study Report and Project Plan for the rodent eradication on Suvarow Atoll.
- Fiji - **National Trust of Fiji Islands**: on-going support with the planning for invasive plant management, forest restoration and biosecurity on Monuriki Island and Sigatoka Sand Dunes National Park.
- French Polynesia - **Société d'Ornithologie de Polynésie (SOP-Manu)**: Review of the draft Operational Plan for the eradication of the Pacific rat on Vahanga Atoll.
- Kiribati - **Wildlife Conservation Unit of the Ministry of Environment, Lands and Agricultural Development**: on-going support and sourcing of equipment.
- Kosrae - **Invasive Species Unit of the Kosrae Department of Resources and Economic Affairs**: provided comments on Rapid Response Plan for Agencies Responding to Land and Aquatic Invasive Species in Kosrae and the Kosrae Comprehensive Procedure on Border Control and Inspection.
  - Regional - **BirdLife Pacific Invasive Species Programme**: on-going support to BirdLife Pacific and partners.
  - Samoa - **Division of Environment and Conservation of the Ministry of Natural Resources and Environment**: support with control trials on pulu mamoe (*Castilla elastica*) and tamaligi (*Falcataria moluccana*) for the Mt Vaea Restoration Project.

## Call by Pacific Leaders for Action against Invasive Species at Pacific Islands Forum Meeting, August 2012, Cook Islands

PII and BirdLife Pacific have worked together on behalf of the Pacific Invasives Partnership (PIP) with Te Ipukere Society to gain the support of the Prime Minister of the Cook Islands, Hon. Henry Puna, for an initiative to raise the profile of invasive species as a major environmental and socio-economic issue for the Pacific islands region at the Pacific Islands Forum Meeting in Cook Islands.

We are delighted to report that Prime Minister Puna, (the Minister responsible for the Environment and a champion of environmental issues), championed the initiative and urged Pacific Leaders during the Forum Leaders' Retreat to support more action to tackle invasive species. He was successful in his endeavour as demonstrated by the inclusion of a call by Pacific leaders for action against invasive alien species in the Forum communiqué ([www.forumsec.org/pages.cfm/newsroom/press-statements/2012/43rd-pacific-islands-forum-communicue.html](http://www.forumsec.org/pages.cfm/newsroom/press-statements/2012/43rd-pacific-islands-forum-communicue.html))

Two documents were prepared to support the initiative: one entitled "Discussion flier" is aimed at Forum Leaders; the other called "Information for decision-makers" is directed at Officials who determine which topics go before the Forum. Many thanks to all who helped with the initiative and the preparation of the documents.

As a follow up to the positive outcome at the Forum, the initiative was introduced and the documents circulated by Mr Vaitoti Tupa, Director of the Cook Islands National Environment Service to delegates at the SPREP meeting in Noumea, New Caledonia in early September. Also, PII made available the two documents to delegates at the Fifth regional meeting of heads of agriculture and forestry services, 24th – 27th September, Nadi, Fiji.

## Invasive Species recognised as being harmful to Melanesian communities, their economy and natural heritage at the Melanesia Spearhead Group Environment and Climate Change Technical Advisory Committee Meeting, 23rd – 25th July 2012, Port Vila, Vanuatu

PII, the IUCN Species Survival Commission's Invasive Species Specialist Group (ISSG) and IUCN Oceania worked together on behalf of the Pacific Invasives Partnership (PIP) to raise the issue of the spread and detrimental impacts of invasive species in Melanesia, at the Melanesia Spearhead Group (MSG) Environment and Climate Change Technical Advisory Committee (ECCTAC) Meeting, 23rd – 25th July 2012, Port Vila, Vanuatu.

A presentation was made at the meeting as well as an accompanying information brief, outlining the negative impacts of IAS on Melanesian natural heritage, communities and economy. The methods used in combatting invasive species were also outlined and a set of recommendations were put forward for consideration by the meeting.

The presentation, which was made by Mr Taholo Kami, Director of IUCN Oceania, was well received by the meeting, resulting in the ECCTAC recognising the significance of the issue and endorsing the recommendations. Recommendations include:

1. Promoting a cross-sectoral approach to invasive species management;
2. Recognising the cross-cutting nature of the invasive species issue;
3. Increasing political and financial support for invasive species management;
4. Integrating invasive species management into the National Biodiversity Strategy and Action Plans and National Invasive Species Strategy, Action Plan and Policy Guidelines to facilitate progress towards achieving the Aichi Target 9; and
5. Responding to invasive species, based on prevention as the first line of defence, early detection and rapid action when prevention fails, eradication and, finally, management of established invasions.

Building on initiatives such as this and the one at the Pacific Islands Forum Meeting where the Leaders called for action against invasive species (see previous article) is essential to generate long-lasting political support for biosecurity and invasive species management in the Pacific region.

# PII SUPPORTED PROJECTS

## Samoa: Mt Vaea Restoration Project - From Parks & Reserves Section, Ministry of Natural Resources & Environment

The mini trial on pulu mamoe (Panama rubber tree - *Castilla elastica*) has reached its fourth month and eleventh phase of monitoring since its establishment on the 30th May 2012 upon completion of the PII Invasive Plant Management Training Course in May 2012, Samoa. The monitoring interval initially started being weekly (on every Friday) but has recently changed to fortnightly due to the gradual changes observed on the treated trees. Six treatment methods were implemented on the five stations of six, with certain application rates determined by the diameter at breast height (DBH) values. This is summarised in the table below.

An analysis of the results shows treatment four "Hack and squirt" and five "Gel only" as having an effect on the pulu mamoe, however, treatment one "no action" trees are also defoliating. This may be due to seasonal changes (dry season /drought in Aug-Sept) causing defoliation on some rubber trees. Another issue is the variation in scoring between different observers attending to the monitoring at certain phases.

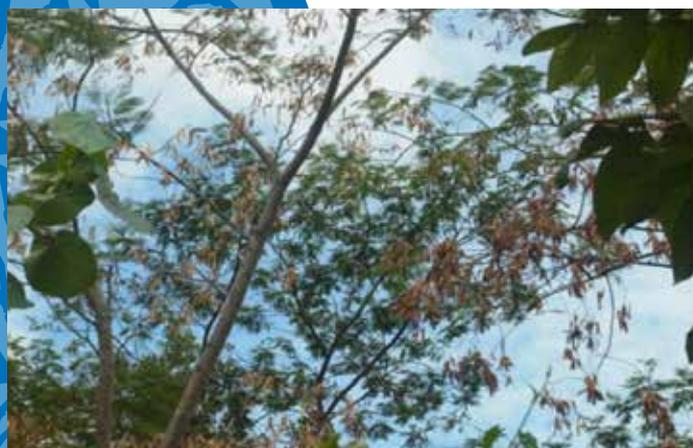
Another trial, also underway is for the control of tamaligi uliuli (Silk tree - *Albizia chinensis*) and tamaligi pa'epa'e (Kerosene tree - *Falcataria moluccana*) on Mt Vaea. Similar methodology used for pulu mamoe is being applied but using the herbicide triclopyr. A work-plan has been developed for the control of tamaligi and it is expected that all tamaligi trees on Mt Vaea will be treated by the end of October 2012. About 12 ha of land have already been treated for the control of tamaligi and 250 native seedlings have been planted in an area of approximately 0.4 ha. The monitoring is carried out on a monthly basis to determine which treatment methods are having faster and more effective results.

In addition, awareness materials, such as signs and booklets have been designed. We would like to thank PII for the time-saving back bag injector and other equipment provided to help kick start the work and for the continued mentoring following the training course. We would also like to take this opportunity to invite all interested partners and stakeholders to help in the implementation of this unique and challenging project as far as the Pacific island region is concerned.

Treatment	Treatment Method	Description	Equipment	Rate
1	No action	Find closest Panama rubber trees(PRT)	None	Nil
2	Hack only	Hack around the circumference as close to the base.	Tomahawk	Nil
3	Squirt only (basal bark)	Squirt at closest to ground surface (about 3 squirts)	100% Glyphosate, trigger spray	12ml/10cm DBH
4	Hack & Squirt	Chop close to base around circumference; apply glyphosate on the hack area	Tomahawk; 100% glyphosate;	12ml/10cm DBH
5	Gel only	Apply gel around the base of the stem; 1 band of gel apply evenly	Gel bottle, glyphosate + additional ingredients	Evenly applied around circumference
6	Hack & squirt	Hack at stem's full circumference closest to base; insert glyphosate at exposed buttress roots evenly	Tomahawk; Syringe; 100% glyphosate	3ml/10cm DBH



Treatment of tamaligi (Photo: MNRE)



<<< Monitoring and data recording >>>  
(Photo: MNRE)



# REGIONAL UPDATE

## Hawaii: Conservation Outreach: Measuring effectiveness From Keren Gundersen, Project Manager, Kauai Invasive Species Committee

Designing clear, concise, and easily understood outreach materials relating to conservation is a challenge. Not only is it important to explain the biological perspective of conservation, but how people are able to help.

The Kauai Invasive Species Committee (KISC) is a project of the Pacific Cooperative Studies Unit of the University of Hawaii. The goal of KISC is to help preserve the biodiversity, agriculture, and way of life on Kauai, which is the oldest of the main Hawaiian Islands. Targeting and removing newly introduced invasive plants, animals, insects, and pathogens are a top priority and it is accomplished by working with conservation partners and collaborating agencies. Education and outreach are key components for KISC in connecting with the community.

Finding the starting point in addressing outreach concerns is a challenge; if the public does not understand the problem, why would they care about the solution? The tendency is to use science, which often results in more confusion. Once there is an understanding of a problem, the reasons for taking an interest in it are so varied it is hard to choose the most appealing angle for maximum public support.

To avoid some of the pitfalls that outreach and education efforts result in, KISC has taken an innovative approach to outreach in recent years. "We also wanted to be able to measure our effectiveness with our message" stated Tiffani Keanini, KISC Outreach Specialist. "So we've moved to a more format-based outreach strategy that always includes an interactive display."

The first year this strategy was implemented, the creative team capitalized on the familiar tongue-in-cheek expression "Does Size Really Matter?" They created larger-than-life models of the tiny little fire ant (normally 1/16th of an inch), stinging nettle caterpillar (normally only around 1 inch), and a coqui frog (usually about the size of a small coin). The messages focused on the fact that although these creatures are small, their impact can be huge to

agriculture, human health, and biodiversity.

The children loved the display, and the adults were amused by the campaign. To tangibly measure the success or otherwise of the message, everyone was invited to put their signature on the giant frog, as a way of saying they understood the message.

<<<Close-up of coqui with signatures  
(Photo: KISC)



"Last year, we went with a construction-site theme," Keanini explained. Signage was the key element of this strategy with a "Caution: Invasive Species" sign driving home the message. Other signs were used to show the effects of invasive pests. These included messages such as "Choking Hazard" (as in plants choking out other plants), "Erosion Hazard", "Flood Hazard", etc. Signs were paired with either real examples of the pest, or photos. The most popular part of the display was the "STOP Invasive Species" sign, which was the interactive element of the theme where the community was invited to sign or add a message on the sign as a show of support.

This year, KISC made an extra effort to revamp their messaging, using a horror movie theme. Posters were designed for each Target species with a theme of "Admit None". An example of one of the posters was the early detection poster, which was headlined CREATURES FROM THE ABYSS, stating "Terror runs rampant on Kauai as new monsters strike again!" The shocking messages appealed to those with a sense of humour but the posters also provided informative information disguised as the movie credit.

"People were really intrigued and thought the posters were great," Tiffani enthused. "They also said that they were more inclined to read the species information because of the way it was formatted in the movie credit area."

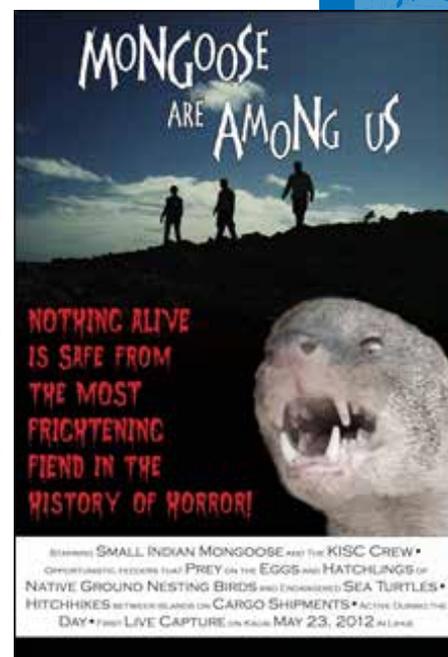
The interactive section of the display was a free-standing movie marquee with ADMIT NONE movie tickets stapled to it. The public was invited to sign a "movie" ticket as a demonstration of their support.

KISC's outreach efforts appear to have worked, with many of their partners requesting copies of posters and banners to display at their own outreach events or plant nurseries. Each new outreach theme is launched at the annual County Fair and used throughout the year at other events, lectures, and presentations. All of the items mentioned can be viewed at: <http://www.facebook.com/pages/Kauai-Invasive-Species-Committee/103663463003431?sk=photos>.

>>>Mongoose Horror Movie Poster  
(Photo: KISC)



Stop Invasive Species sign  
(Photo: KISC)



## Guam: Ko'ko' for Cocos - From Diane Vice, Guam Agriculture's Division of Aquatic & Wildlife Resources

The brown tree snake (*Boiga irregularis*: BTS) was accidentally introduced to Guam in the late 1940s and, within 30 years spread throughout the island causing the extirpation of the ko'ko', or Guam rail (*Gallirallus owstonii*), and nine other forest bird species (Savidge 1987). The ko'ko' was listed under the Federal Endangered Species Act in 1984. In the mid-1980s, with help from mainland zoos, Guam Division of Aquatic and Wildlife Resources (DAWR) collected 19 Guam rails from the wild. These original captured rails were used to develop a captive breeding program for ko'ko' reintroduction efforts.

Today, there is a captive flock of ko'ko' at DAWR's breeding facility in Mangilao, as well as another captive population on the US mainland that is distributed among 17 participating zoos. The DAWR is able to release over 100 birds annually in places like the snake-free island of Rota, located 40 miles north of Guam, and predator-controlled areas on Guam.

Although released birds on Rota are faced with predation from cats (*Felis catus*), monitor lizards (*Varanus indicus*) and the hazards of people, released ko'ko' on Guam face the ubiquitous brown tree snake and a lack of understory due to heavy grazing by Philippine deer (*Rusa marianna*) and rooting by feral pigs (*Sus scrofa domesticus*).

Pilot ko'ko' release projects on Guam have been successful with ko'ko' reproducing in intensively managed, predator-re-

duced areas. In January 1999, within six weeks of release, Guam rails were successfully reproducing within a 23-ha area in northern Guam. Eighteen nests produced 42 successful hatches and second-generation offspring were observed (DAWR 1999 Annual Reports). The Area 50 project was a landmark rail release; it was the first time rails successfully foraged, paired, bred and produced young in the wild on Guam since the 1980s. Unfortunately, the Area 50 rail population did not sustain itself. Without infusion of new releases and sustained cat and ungulate control, the population slowly declined. The decline of the Area 50 rail population was attributed to the presence of feral cats in a heavily browsed habitat; the rails were unable to escape cat predation without adequate cover.

These earlier release efforts identified the need for predator-controlled habitat without the damages caused by feral deer and pigs. Cocos Island, a 33.6-ha (83.1 acre) atoll-like island located 2.5 km southwest of Guam provided a unique opportunity to recover Guam's flora and fauna without the presence of cats, deer, pigs, or snakes. However, the high density of rodents on Cocos Island posed a risk of predation for rail eggs and would prevent the detection and removal of any incipient brown tree snake population.

In 2005 a management plan was developed to address the needs for establishing a breeding population of ko'ko' on Cocos Island. The planning for Ko'ko' for Cocos was funded by the US Department of Interior's Office of Insular Affairs Brown Tree snake Technical Assistance Grant Program, and the initial seed grant for the project was a US Fish and Wildlife Safe Harbor Agreement Grant.

The primary objectives of the Ko'ko' for Cocos management plan included 1) the development of a Safe Harbor Agreement between the US Fish & Wildlife Service and local landowners; 2) development and implementation of bio-security and response protocols to protect the island from brown tree snakes, rodents, cats, dogs, chickens, etc.; 3) rodent eradication; 4) monitor lizard reduction; 5) brown tree snake detection surveys; 6) native forest enhancement; and, 7) the release and monitoring of ko'ko' for survivorship, nesting success and habitat preference.

The development and signing of a Safe Harbor Agreement (Agreement) between the US Fish and Wildlife Service, DAWR, Guam Department of Parks and Recreation, and the Cocos Island Resort (CIR) provides protection to the private landowner against future restrictions on land use due to the presence of endangered species on their property. The Agreement outlines the responsibilities of all signature parties and includes the man-



# KO'KO' FOR COCOS

## What would Che'lu do?

1. Che'lu never packs a pest.
2. Che'lu always puts litter in its proper place.
3. Che'lu loves his island.

If you see a rat, cat or snake on Cocos Island  
please call 488-RAIL(7245)

agement tasks described in the Ko'ko' for Cocos management plan.

The Agreement and initial planning set the stage for partner development. The scope of the project interested a broad array of Federal and local partners willing to assist with the success of the project. In addition to the Department of Interior's Office of Insular Affairs and Fish and Wildlife Service, the US Department of Agriculture offered expertise and funding through Wildlife Services, the National Wildlife Research Center, Forest Service and the Natural Resource Conservation Service. Local government agency partners included Guam Agriculture's Forest and Soil Resources Division and DAWR, Department of Parks and Recreation and Guam Visitor's Bureau. In addition to the huge support of the Cocos Island.

Resort, other private entities have assisted, such as the Pacific Daily News supplying ink for rodent tracking.

Following the early planning and partnership development stages the habitat on Cocos Island was enhanced in preparation for the release of ko'ko' birds. Native forest enhancement activities included the annual removal of invasive vines, tree trimming and the planting of over 1000 native seedlings of eight native species within 16 acres on Cocos Island.

Biosecurity protocols were implemented in 2009 and include the monitoring for rodent activity on Cocos Island using inkpad coconut-baited rodent boxes, rodenticide bait blocks installed in visiting vessels, brown tree snake trapping in high-risk dispersal areas on Guam (i.e., cargo and vessel storage areas) and a large Ko'ko' for Cocos awareness campaign featuring Che'lu (Guam rail character) who never packs a pest, inspects his cargo and vessel and calls 488-RAIL if he sees a cat, rat or snake! The awareness primarily targets vessel operators and staff of the Cocos Island Resort who are the eyes on the ground for spotting invasives.

Also in 2009, the rodents were eradicated from Cocos Island through an integrated approach that included trapping, bait stations and hand broadcast of rodenticide bait. Both Diphacinone and broadificoam were used in the process and intensive monitoring indicated no mortality or sublethal effects on Micronesian starlings (*Aplonnois opaca*) or other non-targets.

In 2010 a brown tree snake detection survey was completed using dead mice as attractant in snake traps on Cocos Island. Seventy-five traps were set and checked twice per week for eight months with no signs of snakes on the island. Removal of monitor lizards started in 2009 and has continued – with the removal of over 350 monitor lizards. The stomach contents analysis has not detected any ko'ko' remains in any of the monitors removed.

The "Ko'ko' for Cocos" project has come a long way since initial planning and partner development stages. Cocos Island today is a rodent-free island with free-ranging ko'ko' birds reproducing in the wild. Over twelve nests and ten chicks have been documented since the release of captive-bred ko'ko' in November 2010, with many more of the secretive ko'ko' assumed produced. The project is a nice example of private and government partnerships working together to promote wildlife recovery on Guam.

#### References

Guam Aquatic & Wildlife Resources Division, 1961-1990. Job Progress Reports in Fish and Wildlife Restoration Annual Reports submitted to Federal Aid.

Savidge, Julie A. 1987. Extinction of an island forest avifauna by an introduced snake. *Ecology* 68:660-668.

## Enjoy Cocos with Che'lu and Friends!

チェルーや友人とココスを楽しんで下さい。 請與Che' lu和朋友們一起愉快地享受Cocos島。  
Magsaya sa Cocos Island kasama ang Che'lu at mga kaibigan. 제루, 그리고 여러 친구들과 함께 코코스섬을 즐기세요.

Fanmagof guini gi islan Cocos yan si Che'lu, yan i mangga'chong-na.



## Mexico: Eradicating invasive mammals from mangrove islands: it can be done! - From Marlenne Rodríguez Malagón and Araceli Samaniego Herrera Grupo de Ecología y Conservación de Islas, A.C.

Picture a wet tropical island set in a stunning coral reef in the Caribbean Sea; add mangroves, a forest, all kinds of migratory birds and crocodiles; now multiply it by four: that's it! Those are the four cays of the Banco Chinchorro Biosphere Reserve (BCHBR) in the Mexican Caribbean. More than 150 species of migratory birds stop here each year while a wide range of reptiles —from endemic geckos to iguanas— call it home. The cays, currently inhabited by just a few people (<50), have witnessed the passing of many ships over the centuries, unfortunately resulting in some shipwrecks. It was probably one of those shipwrecks that brought rats (*Rattus rattus*) to this biosphere reserve. Rats spread and thrived throughout the three biggest cays, thanks to good weather and the abundance of food. Not surprisingly, people introduced cats later on, so native species had not one but two invasive predators to deal with.

Recognised as a doable but challenging project, the eradication of invasive mammals from BCHBR began its planning phase in 2009. The Mexican NGO Grupo de Ecología y Conservación de Islas, A.C. (GECI) teamed up with the National Commission of Natural Protected Areas (CONANP) and another NGO, Amigos de Sian Ka'an, A.C. (ASK). Support from other government agencies such as the Ministry of Interior (SEGOB) and the Mexican Navy (SEMAR), as well as funding from national and international donors, were key elements. Because of the inherent complexity of working on wet tropical islands (climate, flooded ground, land crabs, etc.), and because mangroves have been identified as a potential source of failure for rodent eradications, we decided to implement the restoration project in two steps: the smaller cays first, the biggest cay later.

Seasonal monitoring of target and non-target species started on all cays early in 2010. As it was clear that cats were present only on the biggest cay, trapping commenced later that year and we are currently looking for the last few individuals. By 2011 we were confident that: (a) *R. rattus* was the only rodent present; (b) land crabs were very abundant, consuming more bait than rats; and (c) although present all year round, land crab populations fluctuate in activity related to rainfall periods. Therefore, once we identified the best season to operate, the appropriate bait rate for each island and habitat type (mangrove vs. rain forest), and the mitigation measures to minimise impacts on non-target species, the implementation phase of the rat eradication began.

In April 2012, two cays (Cayo Norte Menor-15 ha and Cayo Norte Mayor-29 ha) were treated twice —one week apart— with an aerial broadcast of brodifacoum bait pellets (water-resistant formulation). Unlike most of our past operations, the perimeter of the mangrove areas was not heavily treated by helicopter to avoid bait spills into the ocean. Instead, handmade bait blocks were tied to trees every 100 m. The same treatment was applied to the perimeter of internal lagoons and isolated islets inside lagoons. Also, over 100 black and green iguanas were held in captivity until there was no bait on the ground. Bait consumption was monitored in detail for one month.

As of September 2012, the eradication is looking good: no sign of rats. It seems, therefore, that it is possible to get rid of rats from mangrove islands after all. The lessons learnt and the confidence gained during this project are already helping to adjust the eradication plan for the pending island (Cayo Centro-537 ha). The best news was the minimum impact on native species; while the baseline data will allow following up on future outcomes.



Cayo Norte Menor (foreground) is covered with mangroves; Cayo Norte Mayor (background) has a mix of mangroves and tropical forest.  
(Photo: J.A. Soriano/GECI archive)



Land crabs interfere with baiting operations as they are avid consumers of bait and can be much more abundant than rodents. (Photo: J.A. Soriano/GECI archive)

University Of Auckland,  
Tamaki Innovation Campus,  
Private Bag 92019,  
Auckland  
1142, New Zealand.

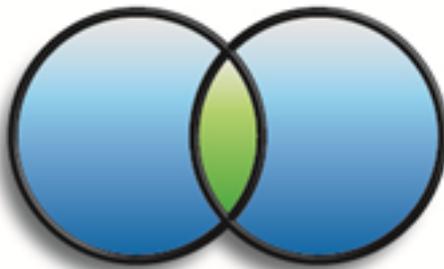
**Phone:** (+649) 923-6805.

**Fax:** (+649) 373-7042.

**E-mail:** [pii@auckland.ac.nz](mailto:pii@auckland.ac.nz)

**URL:** <http://www.pacificinvasivesinitiative.org/pii/index.html>

**Find us on Facebook**



**Pacific  
INVASIVES  
INITIATIVE**