The PII News, December 2011

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 further information.

Inside this issue:

PII ACTIVITIES

Climate change and Invasive Species

Emma Feenstra has joined PII for a 10-week University of Auckland Summer Scholarship. She is assisting PII with a literature review on the linkages between climate change and invasive species in the Pacific islands region. The review will outline existing regional (and global) actions and mechanisms to address invasive species in the Pacific. Consideration will be given to the potential impacts of invasive species on PICT economies, food production systems and food security.

Emma said that after travelling for a few years after High School (Africa, Asia and Europe - next destination of choice is PNG) she finally discovered a subject worth going into student debt for - Science! Emma has just finished a BSc in Biology and, will head into postgraduate study in 2012.

PII thanks the University of Auckland for Emma's scholarship.

PROJECT UPDATES

FIJI: Restoration of habitat for Fijian Crested Iguana and Wedge-tailed Shearwater— from Steve Cranwell (BirdLife Fiji Programme) and Ramesh Kumar (Kula Eco Park)

The restoration of two islands in the Mamanuca Group in western Fiji took a major step forward when operations to remove feral goats and Pacific rats were completed in November through a partnership between The National trust of Fiji Islands (NTF) and BirdLife International Fiji Programme (BLF) and PII. This work was the result of many years of consultation with the landowning community and two years of planning (see previous issues of The PII News).

Like all such operations, the eradication of goats and Pacific rats from Monuriki and Kadomo Islands was not without its share of challenges. Goats on both islands were a source of local food and income making

them a valued resource. Also, Monuriki Island supports a small population of the critically threatened endemic Fijian Crested Iguana, which has cultural value. Developing technical solutions for the eradication of both invasive mammals required methodologies that would remove all goats while meeting landowners' needs and ensure that iguanas were not harmed in the rodenticide applications.

In partnering PII and, through them, the NZ Department of Conservation (DOC), NTF and BLF were provided with technical advice and support in the planning, preparation and implementation of both operations. This ensured project staff were well informed for operational decision-making and when discussing technical issues with the many community, landowner, government, NGO, and tourism stakeholders. This knowledge was critical in gaining the island landowners confidence that the removal of goats was necessary in the first instance and that this could only be achieved through sufficient effort and appropriate techniques. Similarly being able to provide evidence based information on the risks and benefits of rodenticide use and how its application would be managed to protect wildlife and people was important for all stakeholders.

The goat eradication team on Monuriki Island, Fiji. (Photo: Steve Cranwell)

With little specialist experience in Fiji for goat eradications and aerial baiting operations PII and DOC, were able to source professional goat hunters and a specialist pilot from NZ. The involvement of these people ensured the operations were implemented in the best and most efficient way possible optimising the likelihood of the eradications succeeding. Their experience also provided valuable learning opportunities for NTF and BLF staff.

A helicopter search as part of the rodent eradication did not detect any goats and a return visit by Ross Wharfe and Luke Robertson, the professional hunters with their trained detection dogs Kawa and Patch, did not find any goats or sign of goats and NTF and BLF are confident that the feral goat eradication has been successful. Up to two years of surveillance are required before the rat eradication can be declared a success.

As part of the conservation work for the crested iguana, a captive breeding programme is underway at Kula Eco Park near Sigatoka. Eight Males and eight females are in individual cages and will be paired up. All iguanas are very healthy and females are being fed with high calcium diets in preparation for breeding. Three females laid a total of 11 eggs which are being artificially incubated. All four juveniles from last year's hatching are growing rapidly and will soon be microchipped for identification purposes.

More information and images at – http://www.birdlife.org/community/2011/12/invasive-species-cast-away-in-fiji/ ; http://www.nationaltrust.org.fj and http://www.fijiwild.com/

FIJI: The challenges and lessons learnt from the aerial eradication of rats on Monuriki and Kadomo islands in the Mamanuca Group - from Elenoa Seniloli (BirdLife Fiji Programme)

After many months of planning and logistical arranging for the Monuriki and Kadomo aerial rat eradication, the operation was finally undertaken on the 15th and 21st October, 2011. Despite many setbacks and delays in arrival of equipment for the operation, delays in approvals from local authorities and unfavourable weather conditions, we finally completed the operation with no setbacks during the two bait-drop days. The eradication team involved Birdlife Fiji staff, Nadroga Provincial Office representatives, National Trust of Fiji staff, island owners and chief pilot Norm Kensington (Island Hoppers, Nadi) and technical advisor John Oakes (Central South Helicopters, NZ).

This operation was a great learning experience for me in terms of planning. At times I found the task very challenging and thanks god to my network of colleagues in the invasive species management field as they were able to help me along the way. Here are some of the lessons I learned from the challenges of the project:

- Communication within the team seems very simple, however it's a critical part of the preparation and it is vital to not overlook the need to continue communicating amidst the many tasks before and during the operation. Keeping everyone regularly informed on operational details (timings, responsibilities, etc) is crucial during the operation.
- Weather forecasting was a major factor in the operation and a competent forecaster who can provide information about probable conditions well in advance of the operational date (7-10 days minimum with increasing accuracy as the application date approaches) is essential. Take time to learn and understand the weather systems and weather map so you (as manager) can cross-check information and make informed decisions for the operation to proceed or not.

- Never leave anything to chance; get approvals and permits well in advance to avoid delays to the operation. Getting approvals/permits and support from various government departments for the aerial drop took a long time because of processing requirements and it is necessary to secure support for the eradication well in advance of the operation.

Aerial operation in progress (Photo: Elenoa Seniloli)

- Choose team members who are motivated and believe in your operation. They should be team players and willing to dedicate their time and energy to the project. Ensure that your team has all the skills needed to perform specific operational needs, even if you have to buy them in for the period of the operation. In this project we contracted the services of an experienced pilot and a GIS expert to train local staff in GIS programmes for analysis of flight lines.
- Sourcing equipment was a major challenge, all aerial equipment such as the TracMapGPS/GIS systems, helicopter spreader buckets plus associated equipment had to be sourced from New Zealand. Both securing willing contractors to rent equipment and freighting it to Fiji was a challenge. Source equipment well in advance and freight equipment several weeks prior to operations, to avoid disappointment during operational days (shipping gets delayed, etc.).
- Networking was crucial in the project and BirdLife International would like to acknowledge that this operation would not have been possible without the efforts of many in Fiji, including: National Trust of Fiji, Nadroga Provincial Office, Mamanuca Environment Society, Tour Operators (Mamanuca group), Department of Environment, Koronivia Research Centre, the landowners of Monuriki (Mataqali Vuna-i-vi) and Kadomo (Mataqali Namatua), Taukei Yanuya and the village of Yanuya (Koro ko Yanuya).

A big "Vinaka Vakalevu" also goes to all those who helped by providing information, technical advice, guidance and equipment during the project, in particular: Keith Broome and Andy Cox (NZDOC Island Eradication Advisory Group); Souad Boudjelas (PII); John Oakes and Gary Patterson (Central South Helicopters); Peter Garden, Jo Ritchie, Graeme Gale (Otago Helicopters); Robert Fisher, Grant Harper (USFWS); Araceli Samaniego-Herrera (The University of Auckland); and the many others who assisted us in the project.

FRENCH POLYNESIA: Impacts of introduced birds on the last population of the Tahiti Monarch - from Thomas Ghestemme (SOP Manu) (translated by Souad Boudjelas).

French Polynesia is home to some of the world's most threatened species, especially the Tahiti Monarch, (*Pomarea nigra*) (CR), or *'omama'o* in Tahitian, with only 35 individuals known in 2010. The black rat, (*Rattus rattus*) is the primary cause of this critical decline; it preys on the Monarch's eggs and chicks and probably incubating females at night. However, since 2008, thanks to effective rat control in the valleys that host the Monarch, there have been no records of nest predation.

Young Tahiti Monarch (L), Red vented Bulbul (Below-L) Mynas (Below-R) (Photos: Thomas Ghestemme)

Other invasive species threats to the Monarch appeared to be predation and disturbance by introduced birds, namely:

- the common myna (*Acridotheres tristis*) which has been implicated in the predation of eggs, and chicks while in the nest and probably following fledging;
- the red-vented bulbul (*Pycnonotus cafer*) which has been implicated in reducing the chances of survival of the chicks by disrupting the reproduction of paired Monarchs, and competing for food and territory.

A study of the impact of these two invasive birds on the relict population of the Tahiti Monarch, carried out between 1998 and 2002, showed that the reproductive success and survival of the young Monarchs immediately after fledging were affected by the number of myna (P = 0.003) found around the

nests (Blanvillain et al, 2003). Interactions with the myna were significantly greater during the Monarch's breeding season.

During the nestling stage, there was an indication of significantly more interaction between Monarchs and introduced birds and fewer visits by parent Monarchs to the nests to feed their chicks in the case of the nests experiencing failure (Table 1). Monarch breeding pairs, especially males, spent a lot of time chasing myna birds and bulbuls, resulting in a reduction in the feeding frequency. They left the nest unattended for tens of seconds, long enough to result in predation.

Table 1: The effect of invasive birds on the reproductive success of the Tahiti Monarch (Blanvillain & Ghestemme, in prep.)

Observation	Reproduction succcess	Reproduction failure	Mann-Whitney U-tests
Number of interactions between Monarchs and introduced birds (myna, bulbul) per hour	0.3 ± 0.1	1.5 ± 0.2	0.002
Feeding rate per hour	10.5 ± 1.7	7.0 ± 0.5	0.03

Table 2 shows results of observations of the Monarch's breeding success over seven years (4 years 1998-2001, 3 years 2008-2010) and the role of introduced birds. Particularly violent attacks on Monarchs from mynas were observed, including group attacks, some of which forced Monarchs to the ground. Two Monarchs were injured as a result of such attacks.

- The success of Monarch nests varies from 10% to 100% (possible rat predation between 1998 and 2001, no rat predation between 2008 and 2010);
- Of the known causes of failure from 2008 to 2010, most are related to mynas;
- 39% of failures are believed to be caused by myna (no observation of direct predation, but myna birds were subsequently seen a few centimetres from Monarch nests or a group of mynas were present in the tree hosting the nest);
- 20 of the 28 failures occurred during incubation and rearing of Monarch nestlings;
- Control of birds in 2009 and 2010 appears to have been successful (Monarch nests 100% successful in 2010).

Bulbul disturbances may be important during the early Monarch breeding season. Two female Monarchs deserted their territory after bulbuls perched on their nests several times in a row. Bulbuls spent a lot of time feeding in the area of Monarch nests, without being particularly interested in monarchs. In contrast, bulbuls can be quite aggressive towards the Monarchs during their own reproduction period. This species is also clearly in competition with the Tahiti Monarch for food resources.

The population of red-vented bulbul, introduced in 1970, is still growing (only found in one out of 4 Monarch valleys in 2002 and present in all 4 valleys in 2008 (Blanvillain, pers.comm.))

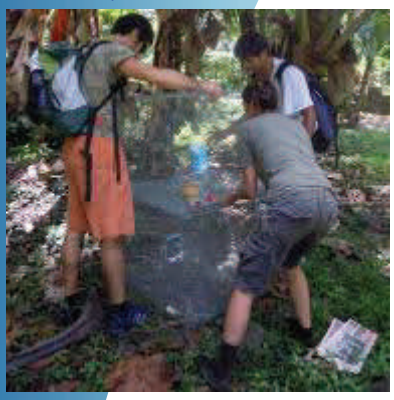
Control by shooting (air rifle) (Photo: C. Blanvillain)

Current habitat of the Monarch, dominated by the African Tulip tree (*Spathodea campanulata*) (Photo: C. Blanvillain)

Table 2: Introduced bird control and Tahiti Monarch breeding failure (from Blanvillain & Ghestemme, in prep.)

	1998	1999	2000	2001	2008	2009	2010	TOTAL
Introduced bird control	None	None	None	Some trapping, Air gun 8 birds (total)	None	Air Gun* 10 birds	Air Gun* 15 birds	
% of chicks alive (per incubation) after 1 month	29%	67%	10%	14%	40%	63%	100%	46%
No. of nest failures caused by mynas	**2**		**3**	**1**	**3**	**2**	**0**	**39%**
No. of nest failures caused by natural events (wind, rain…)				2	0	2	0	14%
No. of nest failures, cause unknown	3	3	4	3	0	0	0	46%
No. of failures during incubation and feeding at nest	3	1	6	4	2	4	0	20
No. of deaths of chicks after fledging (causes unknown)	2	2	1	2	1	0	0	8

(Air gun* = the programme manager carried the gun every time fieldwork was conducted)



Installation of a myna trap at the entrance of a valley. (Photo: C. Blanvillain)

Actions between September and November 2011

- During the months of September-October, 2011, Stephane Ricatte, a SOP-Manu member, spent nearly 100 hours hunting myna and bulbul in the Monarch territories during which 9 myna and 9 bulbuls were eliminated (only 10% of shots were successful as birds stay high in the trees). In October 2011, experiments with bird traps, with or without decoy birds, were made with unconvincing results: 3 mynas were captured over a total of 4 rotations every 4 days.
- A myna was caught in a rat trap baited with coconut (set up to control rats).
- In the upstream part of the valley, which is only accessible with climbing gear, we distributed bread and papaya baited with Starlicide (DRC 1339) every 80m (30g at each point, over two visits). After 3 visits, we regard the operation as successful: 10 mynas before the action and a maximum of 1 myna in the same area after the operation. But more work is required for this method.

Discussion

Despite the small sample and no direct observations of predation, we believe the impact of mynas is significant and is the primary impact on the Monarch's breeding success now that the rat control is effective. The impact of the bulbul is more limited and mainly disrupts the Monarch's breeding. However, a question still remains regarding the role introduced birds may play in the death of Monarch juveniles just after fledging (8 of 28 juveniles died during the first weeks after fledging).

The most critical period for the risk of predation by myna seems to coincide with hatching. This led the program manager in 2010 to monitor nests every 2-3 days and carry the air rifle. The elimination, and/or chasing, of some myna which were posing a threat resulted in 100% nest success. This is an "emergency" technique in the absence of additional resources. It can work for a small number of nests but requires significant time and commitment. Myna birds are very smart, tend to stay high in trees and are difficult to remove, especially if they see the rifle.

There is a real problem for Monarchs in the siting and construction of their nests. They are sandwiched in between introduced birds above them and rats down below. Several observations showed Monarchs building nests high in trees being disturbed by mynas then building a replacement nest lower and camouflaged. In the zone where rats are controlled, reducing the height of the nests above the ground is not a problem. But Monarchs are under pressure from rats in uncontrolled areas.

Paradoxically, a negative impact of the effective rat control programme may be that introduced bird reproduction also benefits from better rat control. The increase in introduced birds in the valleys, especially bulbuls (only 1 bulbul nest observed in 2008 against 10 in 2010), is a real problem for the conservation program of the Monarch.

Future work

In 2012, we wish to:

- have sustainable control by limiting the myna and bulbul densities in inhabited areas downstream in the valleys.
- set up cameras/devices that are triggered automatically to further document the impacts of introduced birds on Monarch nests.
- secure approval from the government to import avicides and initiate more effective control of invasive birds.

References:

Blanvillain, C., Salducci, J.M., Tutururai, G. and M. Maeura. 2003. Impact of introduced birds on the recovery of the Tahiti Flycatcher (*Pomarea nigra*), a critically endangered forest bird of Tahiti. Biological Conservation, 109: 197-205.

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Thibault JC, Martin JL, Penloup A, Meyer JY. 2002. Understanding the decline and extinction of the Monarchs (Aves) in Polynesian Islands. Biological Conservation 108, pp 161-174.

KIRIBATI: Phoenix Islands Protected Area (PIPA) Restoration Work - from Ray Pierce & Derek Brown

The Phoenix Islands are a World Heritage Site, a Key Biodiversity Area and an Important Bird Area (19 species of seabirds can be found on PIPA, many of them globally important populations), reflecting the exceptionally high diversity and abundance of marine and terrestrial biota.

A conservation survey in 2006 found that the presence of invasive species (especially cats, rats and rabbits) was a significant threat to the terrestrial biodiversity of the eight islands of the PIPA, one of the largest marine protected area in the Pacific Ocean. The survey assessed the priorities and feasibility for terrestrial restoration work on the Phoenix Islands. Rawaki and McKean were considered the two top-priority islands for invasive species management and in 2008 rabbits (Rawaki) and Asian rats (McKean) were successfully removed (Table1). In July 2011, an expedition to PIPA carried out the following work on Enderbury and Birnie (summarised in Table 1):

Eradication of Pacific rats on Enderbury and Birnie Islands
Enderbury and Birnie Islands were targeted in 2011 as part of a three nations collaborative mission which included Palmyra (US Line Islands) and Henderson (Pitcairn Group). An aerial baiting operation took place on Enderbury and Birnie Islands using PestOff 20R baits containing 20 ppm brodifacoum. Birnie (50ha) was first baited on 14 July with the second baiting on 19 July at an overall bait rate of 51kg/ha. Enderbury (608 ha) was baited on 15 July and 21 July at an overall average baiting rate of 38.4kg/ha.

Aquila off Enderbury (Photo: Derek Brown)

The operations went efficiently and smoothly and will need to be followed up in late 2012 or 2013 to determine eradication success and biota responses. Ideally that expedition should also include a return visit to McKean in particular and also Rawaki to determine on-going biota responses.

If the operations on Enderbury and Birnie are successful then they represent a cost-effective approach for the remaining PIPA islands and elsewhere in the Pacific. The cost per hectare of this aerial operation, using a helicopter from a ship, was about half the cost of the ground operations undertaken at Rawaki and McKean in 2008.

If the rat eradication succeeds on Enderbury the following changes can be expected:

- Shearwaters and blue noddies will nest and achieve high breeding success with increasing numbers,
- Grey-backed terns and brown noddies will also begin to breed successfully beyond the confines of the lagoon islets,
- Phoenix petrels and white-throated storm petrels have been observed on or adjacent to Enderbury in the past and should also recover in the medium term, along with many other species.

If the eradication succeeds on Birnie the responses of seabirds can be expected to be similar to those at Enderbury beginning with a rapid response in tern and noddy productivity.

Biota surveys on Enderbury and Birnie
The surveys built on previous work carried out at Enderbury and added significant baseline data that was not previously available for Birnie. Plant lists were completed, bird counts and breeding data were collected, lizards were surveyed and vegetation descriptions and mapping were carried out.

Blue noddies, the most primitive of terns, here roosting on the only rat free structure at Enderbury—rat have prevented their recolonisation of Enderbury and Birnie (Photo: Ray Pierce)

Assessment of biota responses on Rawaki (post-rabbit-eradication)
Rawaki is the only island in the Phoenix Group that has not been invaded by rats and as a result it has outstanding seabird values. It did however support rabbits for over 100 years before these were removed in May-June 2008. Visits in November 2009 and July 2011 confirmed the pest-free status of Rawaki and revealed the positive responses of some plants such as *Sida* (kaura), continued spread of nesting areas of blue noddies, Audubon and Christmas shearwaters and continued use of the island by the endangered Phoenix petrel and white-throated storm petrel.

Evening fly on , with moonrise in the background on Rawaki Islands (Photo: Kale Garcia)

Evaluation of the feasibility of eradicating invasives from Kanton and Manra
Kanton offers significant opportunities for seabird recovery and also has considerable ecotourism potential. A key issue for restoration however lies in improving the biosecurity of the seaport (and future airport) to ensure that future gains made from any eradication (cats and two rat species) are secured well into the future. Biosecurity and eradication issues were discussed with locals who are keen and supportive. Ten traps were left to trap rats at the Port for biosecurity and domestic purposes.

Located on the western corner of Manra is a coconut plantation that has been succeeded by indigenous forest that is

more diverse than that of the northern five islands and includes healthy stands of *Guettarda, Morinda, Scaevola* and *Cordia.* Eradication of invasives (cats and two rat species) would offer significant seabird recovery.

What is next for the Phoenix Islands Protected Area?

- Secure the gains - implement and maintain a high level of biosecurity for PIPA.
- Measure the benefits of 2-4 restored islands and address any arising issues – determine response of biota, address any threats that might emerge, asses any further management needs.
- Plan for invasive eradication on Manra, Orona, Nkumaroro and Kanton. This would be most cost effective as a single baiting operation spanning all four islands, followed by removal of any surviving cats
- Consider special situations – should coconut trees be controlled on Manra and Enderbury?

Acknowledgements:
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More information can be found at:
http://www.phoenixislands.org/technical_information.html

Table1: Summary of island seabird species numbers, invasive mammal species and invasive species management. Islands are also listed in order of priority for invasive species removal.

Island	Seabird spp (no.)	Invasive mammal species	Invasive Species Management
Rawaki	17	Rabbit	Eradication 2008. Declared successful 2009
McKean	15+	Asian rat	Eradication 2008. Declared successful 2009
Enderbury	15+	Pacific Rat	Eradication operation completed July 2011
Birnie	10+	Pacific Rat	Eradication operation completed July 2011
Kanton	10+	Cat, black and Pacific Rat	Biota and invasive species surveys 2011, planned eradication
Manra	10+	Cat, black and Pacific Rat	Biota and invasive species surveys 2011, planned eradication
Orona	10+	Cat, Pacific Rat	Planned eradication
Nikumaroro	8+	Pacific Rat	Planned eradication

PALAU: How the Palau Conservation Society (PCS) achieved community support for the removal of invasive mammals in Kayangel State and the on-going biosecurity of Kayangel's natural and human resources– From Anuradha Gupta (PCS, with in put from PCS Staff)

NOTE: This is the second part of a three-part article. See The PII News (September 2011) for the background to this project.

By the end of the project (a complex rodent (*Rattus rattus, R. Norvegicus*) and cat eradication operation on the four islands of Kayangel atoll) we had very strong community support and participation in the project. Community members were very vocal in thanking PCS for the project, and they even threw two "thank you" parties for PCS staff (including one where they killed a pig – which is reserved for very special occasions).

Because involving the community was integral to every move we made, it is difficult to determine any ONE thing we did that built community support. However, we can stress that developing community support took time and was expensive – it was an actual investment on our part.

1.There was strong support for the project before we even began. This was a project the community wanted and we highlighted the socioeconomic benefits they wanted –to eradicate rats for agricultural and health reasons, not for biodiversity reasons. Our meetings and outreach always included mention of these benefits, in addition to the biodiversity benefits.

2.We brought in the community from the very beginning – even when we had no idea what the plan would look like, we held community meetings to introduce the project and discuss what all the options were.

3.We provided monetary compensation for their involvement – we paid people for their time or use of their cars, boat, or space. We offered different types of opportunities for many different types of people to participate – from strong young people (cutting transects) to old women (managing bait stations in taro patches), so everyone had an opportunity to make money and do something they were comfortable with.

4.We spent money in the community – we made as many local purchases as possible, even though it was more expensive than bringing things from Koror. We made a point of spending at all the local vendors.

5.We provided transportation for leaders to attend communi-

ty meetings – we did our best to make sure that the Governor, High Chief, and Speaker-of-the-Legislature were at Kayangel community meetings, and this meant that at times we provided transportation (e.g. organised our boat schedule around their schedules) or purchased their fuel so they could come up on their own boat.

6.We provided equipment for local and PCS participants – we purchased boots, gloves, machetes, and other equipment for local participants as well as PCS staff and did not ask for them back at the end of the project.

7.We respected the culture – in particular, we never questioned or denigrated beliefs about a culturally taboo area. We worked with chiefs and a particular clan to make sure the area was treated in a way that was culturally appropriate it and we modified our activities in the field to accommodate these cultural needs.

8.We left some decision-making up to the community - in particular, we asked the community if they would allow us to hand-broadcast bait around the homes, but said it was their decision. They had time to discuss it before agreeing to allow it as long as individuals could say no for their own homes. We also left it up to the community to determine how to treat culturally taboo areas.

9.We asked the Governor to name community members who could be community supervisors and we relied on and trusted community-based liaison people and supervisors – we made sure they knew all the nuances of the project.

10.We dedicated a significant number of personnel and amount of time to the project (we relocated many PCS staff for long periods) which showed how serious the project was for us – we established a presence in the community, with many staff members staying in Kayangel for 2-3 weeks at a time, mingling with the community and participating in community events. The community saw this and understood that we were making this project a priority.

11.The Executive Director spent as much time in Kayangel as he could – by staying overnight, the Executive Director showed that the Kayangel community and this project were PCS priorities. However, he did not spend long amounts of time in Kayangel so that he would not be available to influence politically.

12.– We got to know the community – we (even the foreign Project Manager) knew everyone by name, and they knew us.

13.We held community meetings over every change in the plan, at the best time for the community, and with big groups of PCS people – we held community meetings for every single change to the plan and at the beginning and end of each separate component and whenever we felt we had not had a meeting in a while.

14.Our meetings were always night-time meetings and were often scheduled for weekends when most community members could attend - we always overnighted in Kayangel for a night-time meeting, which again showed our dedication to the project. For community meetings that were planned ahead (not just a last-minute meeting during the implementation) we usually had a large group of PCS personnel involved. We also conducted school visits that reinforced what we said at community visits.

15.We held community meetings in both Kayangel and Koror – we recognized that Kayangel community members were located in both places, so we had some community meetings in both places.

16.We showed local photos during community meetings – community members loved seeing the work their friends and relatives were doing, and we made a point of showing recent photos as a slideshow during nearly every community meeting.

17.After community meetings we showed movies – this meant that someone from PCS had to stay at the community meeting point for an additional couple of hours after the night-time meeting was over. We think this kept community members interested and happy, and it showed that were not just all about business (and weren't just going to run away after the meeting was over).

PCS Executive Director with Kayangel community members meeting to go over iteration of the Operational Plan. Photo: PCS)

18.We thanked the community regularly – at meetings and during field work, we made a point of publicly thanking the community and individual project participants.

19.We had regular lunch or dinner meetings with Kayangel leaders – to go over every aspect of the plan or the project.

20.Food was part of every meeting – we offered food at every meeting.

21.We went house-to-house numerous times – during the socioeconomic survey, during visits to count pet cats and dogs and distribute safety fliers, as part of the bait station operation, and to distribute biosecurity materials.

22.We targeted landowners – every spot of land on Kayangel is privately owned, so we had individually addressed letters and bird books sent to each landowner.

23.We did targeted individual outreach – at the beginning of the hand-broadcast we spoke to parents of small children individually, showing them visuals of just how much bait their specific children (based on an estimate of how much their child weighed) would have to eat in order to get sick, to reassure them.

24. We had Palauan language materials – we had certain materials translated into Palauan. If the Project Manager spoke (in English) at community meetings, we would often reinforce what was said in Palauan, either as direct translation or as a summary at the end of the meeting.

25.Our outreach materials always mentioned the partnership – every one of our outreach materials (press releases, newsletters, radio shows or announcements) stressed that the project was a partnership between the Kayangel community and PCS.

26.Problems were dealt with at the highest levels – all PCS staff were quite cohesive during the project, kept their ears and eyes open and communicated well to each other as problems in Pacific islands are often communicated through indirect channels not directly. So when any PCS staff heard of any problem (e.g. problems with payments, disagreements, concerns over safety), they reported it to the Project Manager. We made a point of addressing all issues at the highest PCS levels; either the Project Manager or the Executive Director would speak one-on-one with the individual who had the issue as a sign of how important they were to us.

27.We tried to create a happy atmosphere – at the beginning of the project we held a "launch" party and throughout we tried to create a jovial atmosphere despite the serious nature of the project (we didn't focus on "killing" or "poison" but rather on the benefits).

28.We tried to match PCS staff strengths with community needs – PCS personnel who were good at talking with people were asked to lead outreach efforts, and personnel who could work well with women were asked to work in taro patches.

29. We linked the eradication work to on-going desired projects – preparation of the island (e.g. clearing of coconuts) was linked to a coconut oil mill project and we linked ongoing biosecurity to management planning to gain access to PAN funds for Kayangel State.

30. We prioritized the community – at one point in time the Project Manager and the BirdLife Technical Advisor disagreed about the timing of the operation, with the Advisor advocating an additional six-month delay. The Project Manager (with the support of the PCS Executive Director) insisted that the project go forward sooner rather than later, explicitly trading off the possibility of project failure over the probability of losing the support of the community.

The next, and final, part of this article will look at the role of luck and money – and whether PCS would ever do a project like this again.

PALAU: Managing macaque monkeys - from John Parkes (Landcare Research, Manaaki Whenua, New Zealand)

Long-tailed and rhesus macaques have been introduced to several places around the world and affect both native plants and animals and peoples' livelihoods by raiding crops. Many populations are actively controlled with varying degrees of success, e.g. in Mauritius, West Irian in Papua, Hong Kong and Japan, but they have only once been eradicated. Island Conservation eradicated rhesus macaques on Desecheo Island (152 ha) in Puerto Rico between 2008 and 2011.

Long-tailed macaques (*Macaca fascicularis*) were introduced to the island of Angaur (830 ha) in Palau at the beginning of the 20th century, are now a problem on that island and pose a risk to the other islands of Palau as animals are transported as pets and then released. There is circumstantial evidence that the macaques are affecting biodiversity values on Angaur. A bird survey (VanderWerf 2005) showed the number of bird species present on Angaur was less than half that on neighbouring Peleliu Island, and that the abundance of birds (especially canopy-nesting species) was much lower on Angaur for the birds that did occur on both islands.

There is direct evidence that the macaques are affecting the ability of the people of Angaur to grow their subsistence and commercial vegetables because the monkeys raid and destroy crops and fruit. This also has the potential to change the social structure of the island community where some of the traditional status of women is compromised by their inability to grow food. Land ownership is matrilineal on Angaur and women across Palau have both traditional and modern status in part because of this system.

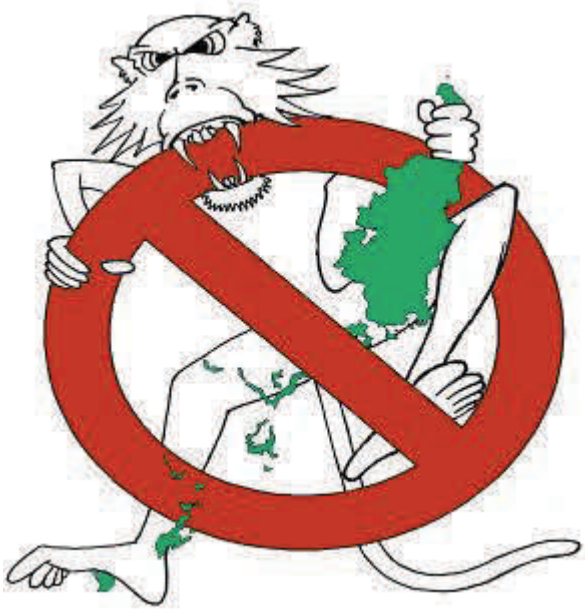
Macaque feasibility study team, Palau

So, the people of Angaur want to solve this monkey problem! Following some initial work by Island Conservation, the Palau government has been managing the issue of translocating

macaques to other places, has been sterilising pet macaques on the other islands, and is about to start finding and removing any small wild populations. But that leaves the source population on Angaur and the problems they cause.

In 2011, John Parkes and Penny Fisher from Landcare Research were commissioned by the Critical Ecosystem Partnership Fund (CEPF) to assess whether the Angaur macaques could be eradicated and what would need to be done to make this possible. They visited Palau and with assistance from Tiare Holm and her team from Sustainable Futures, Joel Miles and the Governor and people of Angaur, produced a feasibility plan. Macaques can be eradicated but it will not be easy and will require input from professionals as well as local support. Shooting was the main control method on Desecheo Island, but trapping and poisoning will be required to achieve eradication on Angaur Island.

The next step is to find the funds to proceed and put together a project team to make the attempt. Feasibility studies are largely aimed at those who have to fund such projects – such studies reiterate why action is required, clarify the management options, recommend the best way to proceed, identify constraints and risks, and give a first estimate of the costs. Decision-makers then can make judgments on the value and risks of the proposal.

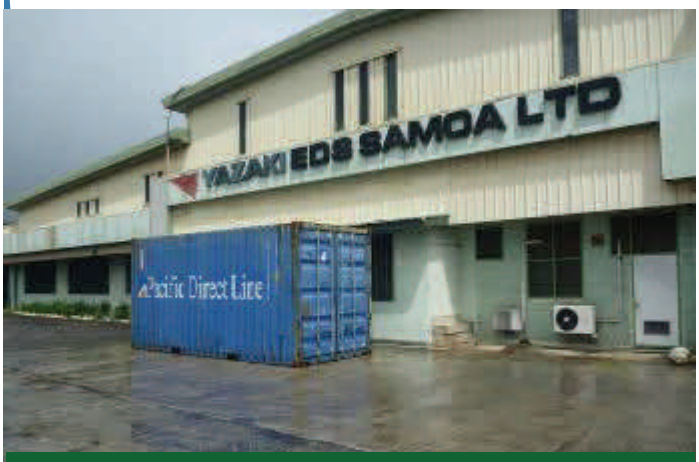


DOSEBELII BELAU

SAMOA: Yazaki Container Exports, an example of Pacific cooperation - from Chris Denny (MAF New Zealand)

In July 2011, the Pacific Forum Line (PFL) Shipping Company approached the NZ Ministry of Agriculture and Forestry (MAF) for help in seeking the Australian Quarantine and Inspection Service (AQIS) recognition of the Sea Container Hygiene System (SCHS) for container exports from Samoa to Australia.

The SCHS is a long term strategy by industry, in collaboration with MAF, to reduce biosecurity risk and compliance costs for sea containers originating from the Pacific Islands. The SCHS has been operating in Papua New Guinea (PNG) and the Solomon Islands since 2006 and was extended to Samoa in 2008 – here it is being run co-operatively by MAF and a consortium of five Shipping Lines. Prior to the SCHS, general contamination on containers from these ports averaged 50% and interceptions of invasive ants were as high as 17% (costing MAF hundreds of thousands of dollars to eradicate where they established colonies in NZ). The SCHS has seen, on average, a 99% reduction in general contamination and ant incursions.



Sea container at the loading area, Yazaki Factory, Apia, Samoa. (Photo: Chris Denny)

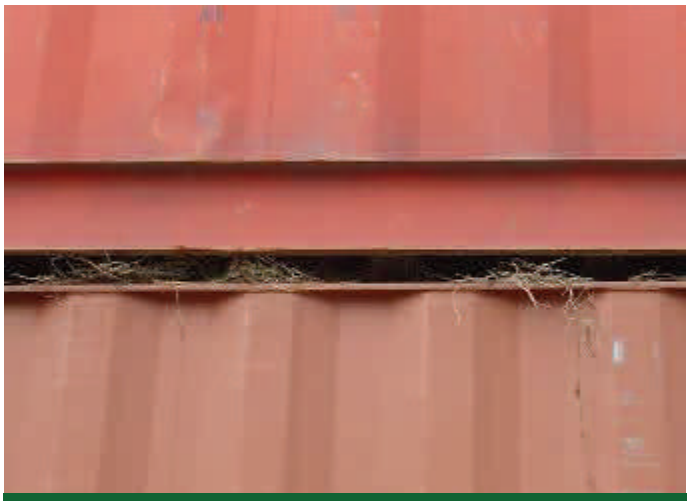
The rationale for PFL approaching MAF was as a result of changes to shipping services which increased the transit times for containers of wiring looms (used in vehicle assembly) manufactured at the Yazaki factory in Samoa to their Melbourne factory in Australia (operated by AAPL - a subsidiary of Yazaki). This resulted in the Melbourne factory having to hold twice as much inventory as previously required, which added significantly to their operational costs. Due to this, AAPL reported that they would have no choice but to close the Yazaki factory in Apia within 18 months. This would have severely affected the Samoan economy as the Yazaki factory accounts for approximately 80% of Samoa's gross domestic product and is its second-largest employer.

A major reason for this increase in transit time is that containers arriving at Melbourne Port are delayed due to AQIS inspections that can take 5-7 days due to demands on stevedore operations. Containers from Samoa are subject to Country Action List inspections (i.e. 100% inspection), even though the containers have been processed through the SCHS. In order to help reduce container transit times, PFL asked if AQIS could recognise the Samoan SCHS and forgo the 100% inspection in Melbourne. AQIS have recently approved

similar SCHS programmes in PNG and the Solomon Islands, and only inspect about 10% of containers from these locations. Therefore, AQIS recognition of the SCHS in Samoa would assist AAPL with their stock level requirements and would help mitigate the need of the Yazaki factory closure and subsequent adverse effect on the Samoan economy.

As a result of discussions between MAF and AQIS, AQIS have agreed to recognise the Samoan SCHS in lieu of conducting additional inspections of the whole consignment on arrival at Melbourne. This result was formally recognised by Shipping Lines, Samoan Industry and Government.

The sea container hygiene work is one component of the wider Pacific system treatments programme which MAF is implementing collaboratively with the Secretariat of the Pacific Community (SPC). This system aims to establish robust quarantine treatment systems around fumigation, heat treatment and sea container hygiene across priority Pacific Islands.



Myna nest between containers. (Photo: Simon O'Connor)

SAMOA: Yellow Crazy Ant on the Aleipata Islands - from Ben Hoffman (CSIRO)

Over the past 12 months, Ben Hoffmann from CSIRO Australia, Masters Student Saronna Auina from The University of Auckland, and staff from the Samoan Ministry of Natural Resources and Environment have been investigating the status and impacts of yellow crazy ant (*Anoplolepis gracilipes*) on Nu'utele Island, Samoa, one of the Aleipata islands.

The Aleipata islands are considered to be of great regional conservation significance because they are uninhabited, relatively pristine, contain many species that are threatened throughout greater Samoa, and lack many exotic species present within greater Samoa. The presence of *A. gracilipes* on these islands is therefore of great conservation concern.

The work consisted of two field trips (October 2010 and May 2011) timed to coincide with the expected extremes of variation within the *A. gracilipes* reproductive and abundance cycles. The work conducted aimed to assess the need for management action against this species, and quantify biological information about the ant required for management protocols. Funding for this work was provided by the Critical Ecosystem Partnership Fund as part of a grant to the Secretariat of the Pacific Regional Environment Programme for a larger restoration programme on the Aleipata islands.

Yellow crazy ant was found occurring in three populations, covering approximately 5 ha, which was an increase in the number of populations, but a reduction in area infested since the last survey in 2003. Another two small populations detected in the November survey were unable to be found again in the May survey. The crazy ant populations on Nu'utele do not appear to be establishing well, and it remains unclear if any population on Nu'utele will be self-sustaining for more than a few years.

The ant's abundance and reproductive cycles were in accordance with other locations throughout the world, but some queen reproduction was unexpectedly found in May. The implications of this remain unclear because this ant's reproductive strategy remains unresolved and is likely to be a novel system.

Impacts on other invertebrates were present, but largely minor, except for large ants such as the trap-jaw ant

Yellow crazy ants seen here attacking a centipede (L) and feeding off Indian Mulberry flowers (Photos: Ben Hoffman)

(*Odontomachus simillimus*) and hermit crabs which suffered significant declines. Levels of impacts were also highly seasonal, being greatest in May when ant populations were greatest. Crazy ant was found to be associated with sap-sucking (phytophagous) insects on the Indian Mulberry (*Morinda citrifolia*) and numerous plant species that provided extra-floral nectar.

Considering holistically the great flux of *A. gracilipes* populations, the restricted impacts, the great likelihood of severe non-target impacts from broad-scale baiting and the impossibility of conducting hand-treatments over all infested terrain, an attempt at complete eradication from the island is not recommended as a management goal.

However, suppression of spread and localised eradication of two small populations could be feasible. Effective ant management on oceanic islands such as Nu'utele, which harbour highly sensitive non-target species, especially those of great conservation significance, will require the development of new baits and/or techniques that prevent or greatly limit non-target impacts.

REGIONAL UPDATES

BirdlLife Pacific Invasive Species Programme-from Deborah Sue (BirdLife International) and Steve Cranwell (BirdLife Fiji Programme)

The BirdLife Pacific Partnership commenced its European Union funded regional Invasive Species Programme in July with the appointment of a manager for the four-year programme that will run to the end of 2014. The Programme has the specific objective *to reduce the spread and the environmental and socio-economic impact of invasive alien species (IAS) in SIDS/OCTs, through replicable Models supporting the eradication and control of IAS and enhancing local and inter-island biosecurity*. The organisations partnering BirdLife in the Programme include *Te Ipukerea Society* (TIS, Cook Islands), *Palau Conservation Society* (PCS), *NatureFiji-MareqetiViti* (NFMV, Fiji), *O Le Si'osi'omaga Society Inc.* (OLSSI, Samoa), *Société d'Ornithologie de Polynésie* (SOP-Manu, French Polynesia) and *Société Calédonienne d'Ornithologie* (SCO, New Caledonia).

The Programme is also supported by a Technical Advisory Group which includes the Pacific Invasives Initiative (PII), the Secretariat of the Pacific Regional Environment Programme (SPREP), University of the South Pacific (USP), NZ Landcare Research and the NZ Department of Conservation (DoC). In November a meeting of the TAG and programme partners was hosted by PII at their headquarters in Auckland.

The meeting finalised project activities which include eradicating rodents (in French Polynesia, Palau, and the Cook Islands) and controlling pigs and deer (in New Caledonia) within areas of high conservation value. In Fiji the programme will develop biosecurity models targeting the American Iguana (*Iguana iguana*), mongoose and the Brown Tree Snake. The meeting also identified the capacity, research, and monitoring needs for the Programme. Among the research opportunities include support for a postgraduate student to examine the social, economic and/or biological impact of managing invasive alien species or related element of the programme. The placement is expected to begin in mid-2012 following completion of a research needs assessment.

The programme's research and monitoring is aimed at improving knowledge of the environmental and socio-economic impacts of IAS on SIDS/OCTs, the three other outcomes for the project will be locally piloted eradication, control and biosecurity models that reduce the impact of IAS on the environment and livelihoods; strengthened capacity at local, national, regional and global SIDS levels; and IAS policies and project outcomes (including Models) communicated and advocated at local, national, regional and global levels.

The BirdLife Pacific Partnership is grateful for the support of PII, SPREP, USP and all its partners in implementing this challenging regional programme. For further information please contact Deborah Sue Deborah@birdlifepacific.org.fj

Participants of the TAG Meeting (Photo: UoA student)

Secretariat of the Convention on Biological Diversity (CBD) and International Union for Conservation of Nature (IUCN) to work together on Invasive Species issues– from Shyama Pagad (IUCN/ISSG)

Strategic Plan for Biodiversity 2011-2020 and Aichi Targets
A Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets were adopted at Nagoya, Japan in 2010. The Nagoya meeting also recommended to the United Nations (UN) General Assembly to declare 2011-2020 the UN-Decade on Biodiversity. Parties are now in the process of revising their National Biodiversity Strategies and Action Plans (NBSAPs) in order to incorporate the Aichi Targets.

Invasive species management will be an issue in meeting several of the Aichi Targets and Target 9 of Strategic Goal B provides a focus on invasive alien species (IAS) and their pathways of spread:

***Strategic Goal B**: Reduce the direct pressures on biodiversity and promote sustainable use*
***Target 9**: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.*

Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA)
The Fifteenth meeting of the SBSTTA was held in Montreal, Canada (7-11 November 2011). The Invasive Species Specialist Group (ISSG) of the International Union for Conservation of Nature (IUCN) was represented by the Chair Dr. Piero Genovesi and the Manager of Information Services, Shyama Pagad, as part of the IUCN delegation. Following are some of the highlights:

A supplementary agreement for the implementation of the Strategic Plan for Biodiversity 2011-2020 regarding invasive species has been signed by Jane Smart, Global Director, Biodiversity Conservation Group, of the IUCN and Ahmed Djoghlaf, Executive Secretary of the CBD.

IAS are recognized as a major threat to biodiversity and ecosystem services. Increasing trade and travel means that this threat will likely increase unless additional action is taken. The data on biological invasions, and the capacity to manage and improve border control and quarantine for the alien species, are not yet sufficient in many countries to achieve the Aichi Biodiversity Target 9 – "By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment."

To support the efforts of Parties, the Convention Secretariat and IUCN have recognized the need for scientific data and technical cooperation to strengthen on-the-ground capacity enabling early detection and rapid response to biological invasions. The IUCN/ISSG and the IUCN Invasive Species Initiative have agreed to work together with the Convention Secretariat to promote implementation to achieve the Target 9 and support relevant initiatives concerning IAS.

A side event was convened by the Secretariat of the CBD, the Global Biodiversity Information Facility (GBIF) and the IUCN/ISSG, to present the Joint Work Programme to strengthen information services on IAS as a contribution towards Aichi Biodiversity Target 9; an outcome of the Informatics Expert Meeting on IAS convened on 5-6 September 2011 by the GBIF Secretariat in Copenhagen, Denmark.

The side event was attended by more than 50 delegates. The presentations from the GBIF (Samy Gaiji), IUCN/ISSG (Piero Genovesi) and CAB International (Gareth Richard) were very well received. Patricia Koleff (CONABIO Mexico) provided an excellent country perspective recalling the need for global/regional information systems. Some delegates strongly recommended the development of a business plan for donors.

SBSTTA:
A scientific advisory body known as the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) was established to provide the Conference of the Parties (COP) and its other subsidiary bodies, with timely advice relating to the implementation of the Convention. SBSTTA has met 14 times to date and produced a total of 153 recommendations to the Conference of the Parties, some of which have been endorsed in full by the latter; others have been endorsed in parts or modified. Endorsement makes these recommendations *de facto* decisions of the Conference of the Parties.

CBD:
The United Nations Environment Programme (UNEP) convened the Ad Hoc Working Group of Experts on Biological Diversity in November 1988 to explore the need for an international convention on biological diversity. An Ad Hoc Working Group of Technical and Legal Experts was formed to prepare the text of the legal instrument. The work culminated on 22 May 1992 with the Nairobi Conference for the Adoption of the Agreed Text of the CBD. The Convention was opened for signature on 5 June 1992 at the United Nations Conference on Environment and Development (the Rio "Earth Summit"). There are 193 parties and 168 signatories to the CBD.

The Conference of the Parties (COP) is the governing body of the Convention, and advances implementation of the Convention through the decisions it takes at its periodic meetings. The Tenth meeting of the Conference of the Parties to the Convention on Biological Diversity was held in Nagoya, Japan (18 - 20 October 2010) and was attended by representatives of several Pacific countries. The Eleventh meeting of the Conference of the Parties will take place in India in October 2012.

Proceedings of the International Conference on Island Invasives Feb 2010, now available

Island Invasives: Eradication and Management. Edited by C. R. Veitch, M. N. Clout, and D. R. Towns.

The conference content covered any aspect of invasive species relating to natural insular ecosystems. This diverse array of subject matter is divided into four sections in the book. The first section deals with overviews and planned or attempted eradications. The second section introduces new technologies and approaches to eradications, such as dealing with multiple invasive species. Papers in the third section concentrate on the results and outcomes of eradications, especially responses by native species. The final section covers the roles and approaches that involve people, policy and invasion prevention (biosecurity).

This book is available for purchase from http://www.mwpress.co.nz/store/viewItem.asp?idProduct=1152 for the special price of NZ$88 up to the end of December. After that the price returns to NZ$110.00.

You can read or print any of the papers via the links on the Publications page of the ISSG website http://www.issg.org/publications.htm#iucn_publications

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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

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