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This summary of invasive species management activities by people and agencies that the Pacific Invasives Initiative (PII) works with is collated and circulated by the PII Team.

Contributions are welcome. Thanks to all those who contributed to this one! Feedback is also welcomed – contact either the PII Team ([PII@auckland.ac.nz](mailto:PII@auckland.ac.nz)) or the people directly involved in projects. The views expressed by authors are not necessarily those of PII. Visit our [website](#) or find us on [Facebook](#) for further information.

## PII ACTIVITIES

### **Economic analysis training – applications close 10 April 2012**

There is a recognised need to be able to present decision-makers with economic data on invasive species impacts and management. PII is working with Landcare Research NZ and the University of South Pacific Institute of Applied Science on a project to address this. As

part of the project, a training course on economic analyses of invasive species in the Pacific will be conducted by Landcare Research. A Call for Applications has been issued and more detail can be found below and on the PII website.

### **Invasive bird management training—applications close 15 April 2012**

Myna birds (*Acridotheres tristis* and *A. fuscus*) continue to spread around the Pacific. PII is working with the Durrell Wildlife Conservation Trust (UK), Landcare Research (NZ) and Division of Environment and Conservation, Ministry of Natural Resources and Environment,

Samoa, on a project to develop a training workshop in invasive bird management with a focus on mynas. The training will be held in Samoa in July and Durrell (who is leading the project) has sent out a call for applications – see details below and on the PII website.

### **Invasive plant management training course**

PII is working with the NZ Department of Conservation, SPREP and professional training consultants to develop a training course to help agencies with the prioritisation of invasive plant management projects and the development and implementation of those projects.

The course is based on the six Stages of the PII Project Process; Project Selection, Feasibility Study, Project Plan, Operational Plan, Implementation, Sustaining the Project. The structure and content of the course has been scoped and work is due to start on finalising the design the course, developing and reviewing training materials and pre-

paring for the delivery of the course in Samoa in May.

A PII Resource Kit for Invasive Plant Management will also be developed as a complement to the training course. This will have useful tools such as weed risk assessments, decision trees, guidelines and templates to help with the prioritisation and management of invasive plant projects.

Once the training course and Resource Kit have been delivered and reviewed (and any changes made), the course will be available for other agencies engaged in invasive plant management.

### **PILN Meeting**

The Third PILN Meeting was hosted by SPREP and the Wildlife Conservation Unit of the Government of Kiribati on Kiritimati Island from 21-28 March.

This year's theme was to "Enlighten and Expand Pacific Invasives Learning Network Collaboration by Fighting to Secure Our Islands".



PII was invited to contribute by running technical sessions on the PII Resource Kit for Rodent and Cat Eradication and Inter-island Biosecurity and providing information on where we can help invasive species country teams.

The meeting brought together about 40 invasive species practitioners, from 15 countries and 5 Pacific Invasives Partners from all over the Pacific, to:

- Assess the state of invasive species management at national and regional levels
- Identify solutions to ensure sustainability of national invasive species teams
- Identify national priority invasive species issues and explore how they can be addressed
- Explore how invasive species issues be incorporated into national and regional processes
- Identify capacity gaps of teams and explore means to addressing them
- Explore how best to engage with communities and stakeholders in invasive species issues
- Provide information and an introduction to resources for priority invasive species management issues
- Clarify the future direction for PILN in terms of network members and expectations

Perhaps the most important outcomes for the meeting were the strengthening of old networks, building of new ones and the sharing of lessons learnt from invasive species management projects across the Pacific.

A big thumbs-up to the Wildlife Conservation Unit of the Environment and Conservation Division of the Ministry of Environment, Lands and Agricultural Development, on a job well-done!!! Special thanks to Ratita Bebe for your hospitality and dedication and to Posa Skel-

ton for a successful meeting! Time to “*Speed up the wheel*” on battling invasive species. And in the words of our Reverend Siafoi Faamau “Love you all and God bless.”

More information on PILN is at – <http://www.sprep.org/Pacific-Invasives-Learning-Network-PILN/piln-welcome>



Future conservationists give the thumbs up to the Third PILN Network Meeting, Kiritimati Island, Kiribati. The meeting was attended by more than 40 invasive species practitioners from east to west and north to south Pacific island countries. (Photo: Natasha Doherty)



The sky over Cook Islet, Kiritimati Island, Kiribati. The Wildlife Conservation Unit is taking action on Kiritimati against threats to pelagic, shore and terrestrial birds from rodents, feral cats and, more recently, poachers. (Photo: Souad Boudjelas)

## PROJECT NEWS

### FIJI:

The UNDP Equator Initiative has awarded a 2012 Equator Prize to a local group working to conserve the Natewa Tunuloa Important Bird Area in Fiji. The Equator Prize recognises 25 outstanding local initiatives that are working to advance sustainable development solutions for people, nature and resilient communities around the world. The winners were announced at a special UNDP ceremony in New York last Friday, and representatives of winning communities will receive their prize, of between \$US 5,000 and \$US 20,000, at an award ceremony at the UN Conference on Sustainable Development (Rio+20), which will be held in Brazil in June 2012.

Establishment of the community-based Sisi Initiative was supported by the BirdLife Fiji Programme in 2006 in response to illegal logging, forest fires, overgrazing, agricultural encroachment and invasive species around the Natewa Tunuloa Important Bird Area. Important Bird Areas are sites that are of critical importance for the survival of wild birds and nature in Fiji and around the globe. Natewa Tunuloa covers large tracts of old-growth rainforest which support globally threatened birds such as Shy Ground-dove and Silktail.

Site Support Groups like the Sisi Initiative are central to BirdLife’s work and one of the most practical ways of

supporting local communities to conserve the places where they live. They demonstrate a new approach to the management of natural resources which couple biodiversity conservation and sustainable livelihoods in partnership with local people. The initiative has been used as a learning model for community-based conservation and forest management across Fiji.

More information at:

<http://www.birdlife.org/community/2012/03/fijian-local-conservation-group-receives-global-award/>

[http://equatorinitiative.org/index.php?](http://equatorinitiative.org/index.php?op-)

[tion=com\\_content&view=article&id=692&Itemid=683](http://equatorinitiative.org/index.php?op-tion=com_content&view=article&id=692&Itemid=683)

**HAWAII:** Plant conservation through site restoration - from David Burney, Director of Conservation, National Tropical Botanical Garden, Kaua'i, Hawai'i.

Because of their geographically isolated locations, the plant species that evolved in Hawai'i over millions of years are highly endemic and nearly 1,300 endemic species have been described in Hawai'i. Of these, more than 100 are today considered to be extinct, with an additional 273 classified by US Federal standards as Threatened and Endangered (T&E), and 85 as Candidate species. The situation is similar throughout the Pacific and in many other tropical regions. The underlying cause of the decline of endemic plant species is destruction of their habitat and the introduction of invasive species, both problems caused by people. In the most degraded habitats, invasive species must be managed before native species can be reintroduced. In less degraded habitats where endemic species still exist, the native plants need to be protected from invasive species.

Since it was established on Kaua'i in 1970, the National Tropical Botanical Garden (NTBG) has been a leader in the conservation of plants in Hawai'i and the greater Pacific area. The challenges of protecting endemic species are enormous, but NTBG is also very concerned about preserving culturally important plant species. Many of these are cultivars that were developed over thousands of years by indigenous people living on the islands of Oceania. Scholars are only now beginning to understand the importance and value of many of these

ethnobotanical plants.

Restoration ecology is central to NTBG's conservation strategy. In the long-term it is the most effective method to ensure survival of those endemic plant species which have been forced to the brink of extinction by habitat degradation and invasive species. The process of restoration is many faceted and an important first step in the process of planning habitat restoration is to understand the ecological history of the site. Armed with this knowledge, NTBG has designed practical and effective integrated strategies for ecological restoration in the NTBG gardens and preserves. Diverse restoration projects, including projects to manage invasive species, have been undertaken by utilizing a historical perspective to guide ecological restoration efforts and this successful approach has been extended in collaborations with other landowners in the Islands.

Most of the restoration ecology projects are undertaken in the Limahuli Preserve, where the ecological health of the habitats ranges from pristine to highly degraded. The Preserve covers about 400 ha and includes habitats ranging from lowland mesic forest to montane rain forest. Within the Preserve there are 12 species that are Federally listed as T&E and 9 "Candidate" species (proposed for T&E status). The NTBG Conservation efforts place special emphasis through its Prevention of



The Upper Limahuli Preserve, National Tropical Botanical Garden, Kaua'i, Hawai'i; helicoptering in (L), the ungulate fence (R - middle ridge) to exclude feral pigs and goats. (Photos: Chiemi Nagle)

Extinction Program (PEP) on species that have fewer than 50 individuals existing in the wild; there are 5 such species in Limahuli Preserve, some of which are only found in Limahuli Valley.

Limahuli Preserve is divided into two major zones: Lower Limahuli Preserve (approximately 240 ha) and Upper Limahuli Preserve (approximately 160 ha). The two areas are separated by a 240 m waterfall, are ecologically distinct and restoration strategies differ for each area. The Upper Limahuli Preserve can only be accessed by helicopter and contains some of the most pristine montane wet forest left in all of Hawai'i. In this area the focus primarily is managing incipient invasive species and augmenting the populations of the 12 species that are Federally listed as T&E and 9 "Candidate" species (proposed for T&E status). The invasive species management project has included erecting, on very rugged terrain, a fence to exclude feral goats and pigs and help with managing the rodent population in the Upper Preserve.

The lowest 20 ha of the Upper Preserve was once a pristine native ecosystem until the Valley was ravaged by hurricanes. These severe storms not only damaged the vegetation, but also spread aerial-borne alien seeds. Recent work trips via helicopter to this remote area have aided in managing invasive species and al-

lowed out-planting of extremely rare species, such as the native mint (*Phyllostegia renovans*) and a handsome fan palm only found in Limahuli Valley (*Pritchardia limahuliensis*).

The Preserve is not open to the public, but an important team in this restoration work is the volunteers who come from the local community as well as from across the country. Project Stewardship, a program in which NTBG partners with local high schools, provides hands-on experience for local students to learn about restoration ecology.

All of the restoration work done at Limahuli is grounded in traditional Hawaiian *ahupua'a* resource management techniques that focus on protecting the interrelationship between all aspects of the terrestrial, aquatic, and marine environments. These cultural traditions are supported by relationships with local cultural practitioners who help maintain the restoration site in exchange for being able to collect forest resources following cultural protocols. NTBG's efforts in plant conservation at Limahuli and other sites on their properties and those of many collaborators show that, even in Hawaii, sometimes referred to as the "Extinction Capital of the U.S.A.," diligent science-based conservation can make headway in the struggle to preserve island biodiversity.

## PROJECT UPDATE

**PALAU:** Conservation of endangered species through the removal of invasive mammals in Kayangel State and the on-going biosecurity of Kayangel's natural and human resources—Part 3 (see PII News September and December, 2011, for previous articles)

The role of luck and money, and whether we would do it again. – From Anuradha Gupta (Palau Conservation Society, with input from PCS Staff).

The Palau Conservation Society (PCS) led a complex rodent and cat eradication operation on the four islands of Kayangel atoll. Kayangel is a classic atoll and is home to a large population of endangered Micronesian megapodes (*Megapodius laperouse*), Palau's most endangered bird (IUCN = EN). Despite numerous delays and challenges, the operation was completed in September 2011 and it appears to have been successful (although this will not be confirmed for at least a year). There was significant community participation and benefits from this project have already been realized. There have already been agricultural benefits from the project and Kayangel has agreed to enhance their protected area status and to create new protected areas.

PCS is very proud of this project and we feel that we have achieved lasting conservation and community benefits. However, we also learned a lot about our own limitations through this project, and we have

thought quite seriously about whether future eradication work of this nature is appropriate for our organization. In analyzing the Kayangel project, we have asked ourselves if, three years ago we had to do it all over again, we would have agreed to take on the project. What we have concluded is that three years ago, we should have said "No!" to the project. In the end, much of the project success relied on luck or on changes that were entirely outside of the project or our control.

Three years ago, we did not have the guaranteed personnel or labor to take on this project. Some of this was solved through project planning – e.g. planning to include community members – but much of it involved last-minute changes and luck – such as technical partners allowing so many volunteers to participate and so many non-project PCS staff being able to participate. Three years ago, if we had analyzed who would confidently be available for the project (if we had some idea of just how much labor would have been needed) we would not have taken on the project.

Three years ago PCS was not in the strong financial position that is in now. A change in leadership and a focus on unrestricted fundraising has given PCS access to funds (actual cash in the bank) that we did not know we would have three years ago. If we did not have access to cash we would have been severely hampered in our implementation of this project, which required large purchases and multiple last-minute purchases – and a payment from one of our donors was delayed five months during the height of field operations.

The change in leadership and the change in financial situation could not have been anticipated three years ago, and based solely on what PCS had available at the time (and previous trends), PCS should not have taken on the project. Additionally, it was lucky that PCS had changed its financial policies to allow for one signature on checks below \$500 by the time the field operations on this project started. If PCS did not have that policy, it would have been difficult to deal with the many last minute needs and purchases.

This project was technically complex and required a steep learning curve. The original Project Manager did not want to take on the project and the subsequent Project Manager accepted the project without fully understanding it. Without the guaranteed expertise and interest of a Project Manager, PCS should not have taken on the project. It was only luck that brought in a Project Manager who was willing to take on the project and build capacity in it.

Three years ago we did not have three guaranteed funding sources. PCS took on the project when only one funding source was guaranteed. We were lucky to have gained the support of two additional donors, but this was also partially due to luck (considering the global markets, etc.). We should not have taken the project on (or at least, should not have promised our community that we would eradicate rats) without more of a guarantee of adequate funding.

This project benefitted from luck in ways that we could not control. For instance, we were lucky that it did not rain – even though we attempted to plan for the weather. In addition, although not a feature of luck, Kayangel was accessible to Koror and had basic infrastructure such as electricity, telephones, and buildings, all of which contributed to the success of this project. In comparing previous PCS projects to the Kayangel project, the Kayangel project benefitted from its proximity and infrastructure.

We were also lucky that an employee of the USDA NWRC heard about the project and stopped in to speak to the Project Manager. This additional technical expertise helped us identify diphacinone as a toxicant op-

tion for reducing non-target losses. If we had not gained access to this source of expertise, we may have had disastrous non-target losses or would have stretched ourselves even thinner trying to move and care for megapodes in captivity (for which we did not have any expertise or enough personnel to do).

We were lucky that an individual in Kayangel finished two small rental rooms just in time for personnel-heavy periods of the project – without those additional spaces we would have had too many people on island without a space for them. We were also lucky that one of our donors was willing to be flexible with scheduling – the project went beyond the original contract period.

BUT - the fact is that we DID take on the project. Additionally, when PCS went through a major leadership transition in late 2009, PCS specifically decided to keep the project going, although there was disagreement in our Board of Directors about whether to remain involved and even though we only had one guaranteed donor. The fact is that PCS had committed to the community of Kayangel, and we felt that we had to at least try an eradication attempt rather than pull out of the project without trying. We were also very concerned that pulling out of the project would have hurt our credibility among donors and technical partners.

Finally, it is important to note that eradications are big business – and there was the promise of big money for the project (which was eventually realized). In the end, the project supported 11 PCS personnel in 7 positions (PCS currently has a staff of 14). For a small organization whose primary *administrative* objective is keeping people employed, the money associated with the eradication was very appealing and it was hard to say no to the project.

Whether PCS will take on another eradication project if so offered will require a thorough analysis of whether we have the conditions necessary to ensure a successful operation: enough money, people, and political/technical support; a communications structure; adequate time; flexible financial abilities and policies; strong and stable leadership (at multiple levels); a wide net of technical advisors; and realistic field conditions (e.g. accessible and with basic infrastructure) given funding and personnel limitations.

## Conclusions

Although we cannot say so conclusively, it appears that this project successfully eradicated rats from all four islands in Kayangel, and is on track to eradicate cats. This project built strong community support and is already seeing agricultural and protected areas benefits. PCS learned a lot about itself and conservation as part of this project. In the end there was a confluence of

planning, the right conditions, and luck to enable the successful implementation of this project. Although only time will tell if we have truly been successful, we are confident that the agricultural, health, socioeconomic, and biodiversity benefits will continue to be realized.

### Acknowledgements

This project was made possible through funding from the United Kingdom Darwin Initiative, Critical Ecosystem Partnership Fund, and Micronesia Conservation Trust, and through technical and financial (in-kind) partnerships with the Kayangel State Government and Traditional Leaders, Kayangel Community, Ngardmau State Government, Koror State Animal Shelter, Helen Reef

Project, Palau Animal Welfare Society, USDA National Wildlife Research Center, Pacific Invasives Initiative, Pacific Invasives Learning Network, BirdLife International, and Palau Conservation Society.

(NOTE: PII thanks PCS for making this and the two previous articles (see PII News September and December, 2011) available. Together they provide an important and honest view of a rodent eradication project implemented by an NGO with limited invasive species management experience. PII is pleased to have been asked to provide technical input to PCS and congratulates PCS and its partners on the project. We look forward to hearing of a successful eradication next year!)

## TRAINING OPPORTUNITIES

### Invasive bird management training workshop - Call for Applicants due 15th April 2012

The Durrell Wildlife Conservation Trust, based in Jersey, British Channel Islands is leading a year-long project in the region to build capacity for invasive bird control and eradication. Durrell is working in partnership with Pacific Invasives Initiative (PII), Landcare Research and the Environment Conservation Division of the Ministry of Natural Resources and Environment, Government of Samoa.

The project is funded through CEPF and as a consequence the focus is on building capacity within those islands that sit inside the CEPF focal region. These islands include: Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Niue, Palau, Samoa, Tonga and the Marshall Islands.

The main species that this project focuses on is the myna bird, but also aims to build the skill-sets and understanding required to control or eradicate other invasive bird species. The project began with the modification of

the PII's existing toolkit for invasive rodent and cat eradication to suit the needs of invasive bird management programmes. Case studies of invasive bird management - with a focus on mynas - from around the world have now been collated by Landcare Research. These two resources will form the basis of the training workshop to be delivered in Samoa in July.

The workshop aims to train a minimum of 15 individuals from organisations within the CEPF-focus islands which have a remit for developing and running invasive species control and eradication programmes. We are now seeking applicants from such organisations to take up scholarships to participate in this workshop. Priority will be given to those individuals that can demonstrate that they will be applying the skills learnt in their work following the workshop. Participants will be expected to come to the workshop with a particular invasive bird problem that their organisation or their government



Common myna (*Acridotheres tristis*).



Jungle myna (*Acridotheres fuscus*) a smaller (about 75%) and more secretive bird than the common myna. Little is known of the jungle myna. (Images courtesy of Dick Watling, NatureFiji-MareqetiViti)

has recognised as an issue to be dealt with. This may be due to the impact the species might have human livelihoods, native species or ecosystems.

During the workshop participants will be given time to develop proposals for the development of an invasive bird control or eradication programme, with a focus on conducting comprehensive feasibility studies prior to jumping into action. It is expected that participants will take these plans back home and develop them, with

input from leaders of this project, to the point where they can be submitted for consideration by funders or other key decision-makers on the island.

Application forms may be obtained by emailing us at: [pji@auckland.ac.nz](mailto:pji@auckland.ac.nz) or [jamie.copsey@durrell.org](mailto:jamie.copsey@durrell.org).

**Application due: Sunday 15<sup>th</sup> April 2012.** If you would like further information then please feel free to contact Jamie Copsey at the same email address.

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### Training Course on Economic Analyses of Invasive Species in the Pacific - Call for Applicants due 10th April 2012

A training course will be conducted by Landcare Research NZ, with assistance from the PII and the University Of South Pacific Institute of Applied Science. The course, funded by the Critical Ecosystem Partnership Fund, will be in three parts;

- Classroom Training: May 14–16, 2012, University of South Pacific Suva, Fiji Campus,
- Case Work Development: May–September 2012 at participants' home organisations,
- Evaluation and Presentation of Case Studies: 2 days in September 2012 (date TBD) University of South Pacific Suva, Fiji Campus.

This course will teach project managers and professionals working in the area of invasive species management, methods to develop, conduct, and present economic analyses of invasive species eradication or control. The training will provide the methodology and tools for participants to conduct their own benefit-cost analyses in the field. It will include a mix of facilitated classroom learning sessions and hands-on practical experience. Emphasis will be placed on how to estimate economic and environmental benefits of managing invasives at the project level. Participants will leave the

course with the experience of completing an economic analysis on an invasive species of their choosing.

There is no fee for attending the training program, but participants will be responsible for their own travel and accommodation. Lunch will be provided during the classroom training sessions. We encourage project managers and professionals from a variety of backgrounds and organisations working with issues surrounding invasive species in the Pacific Islands Region to apply. The training will be in the English language. Previous training in economics is not necessary, but knowledge of Microsoft Excel is essential. Students are asked to provide their own laptops for classroom exercises, if possible.

Application forms may be obtained by emailing the us at: [pji@auckland.ac.nz](mailto:pji@auckland.ac.nz). Preference will be given to applicants currently working on specific eradication or control projects. Applicants are asked to submit a brief overview of a proposed study project that provides information on the invasive species of interest, the location of the study, and proposed option of eradication or control.

Applications due: Tuesday **10 April 2012.**

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## RODENTICIDES

### Brodifacoum versus diphacinone as a rodenticide

**Summary** Two types of anticoagulant rodenticides have proven successful at eradicating invasive rats and mice from islands. Brodifacoum is the most commonly used and has a low failure rate both when delivered from the air and from ground-based systems. It does, however, present a risk to non-target animals such as birds. When such risk is not acceptable or cannot be mitigated, diphacinone has been favoured by some managers because it is less toxic to birds and less persistent in rodents. However, unlike brodifacoum, diphacinone requires a rodent to eat several baits over several days to ingest a lethal dose. This increases the risk that not all rodents will be killed. When data on attempts to eradicate rats and mice for both aerial and ground-based methods are combined, brodifacoum has a sig-

nificantly lower failure rate at 17% (54 of 322 attempts) than diphacinone at 33% (13 of 39 attempts). The difference is more significant when just rats are considered. Ground-based methods show similar failure rates for both rodenticides, but to date the very few attempts using aerially sown diphacinone baits have had a high failure rate compared with that for brodifacoum.

Parkes J., Fisher P. & Forrester G. (2011) Diagnosing the cause of failure to eradicate introduced rodents on islands: brodifacoum versus diphacinone and method of bait delivery. *Conservation Evidence*, 8, 100-106.

<http://www.conservationevidence.com/individual-study.php?id=2354>



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