Department for Environment Food & Rural Affairs

DARWIN INITIATIVE

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Darwin Initiative Main Project Annual Report

Important note: *To be completed with reference to the Reporting Guidance Notes for Project Leaders:*

it is expected that this report will be about 10 pages in length, excluding annexes **Submission**

Deadline: 30 April

Darwin Project Information

Project Reference	21-001
Project Title	Developing a conservation management plan for Samoa's little dodo- the Manumea or tooth-billed pigeon
Host Country/ies	Samoa and Australia
Contract Holder Institution	The Australian National University
Partner institutions	SCS, MNRE, birdlife, DOC NZ
Darwin Grant Value	**£229,842**
Funder (DFID/Defra)	DEFRA
Start/end dates of project	01 May 2014- 31 March 2017
Reporting period (e.g., Apr 2015 – Mar 2016) and number (e.g., Annual Report 1, 2, 3)	April 2014-March 2015 Annual Report 1
Project Leader name	Rebecca Stirnemann/Robert Heinsohn
Project website/blog/Twitter	www.Samoanbirds.org
Report author(s) and date	Rebecca Stirnemann, Robert Heinsohn, Sina Jalloh 3 May 2015

1. Project Rationale

The Manumea or tooth-billed pigeon is found only in Samoa. It is currently listed as Endangered by the IUCN. Recent surveys in upland and lowland forest on both Upolu and Savaii confirm that Manumea numbers are extremely low, and that the species should be upgraded to 'Critically Endangered' under IUCN criteria. A major cyclone (cyclone Evan) in December 2012, is likely to have further affected Manumea populations, together with other native birds. It is therefore vital that the locations of any remaining populations of Manumea are identified so conservation efforts can targeted. As stated in the Manumea recovery plan (MNRE, 2006) it is also critical that information on the basic breeding biology (e.g. whether nesting occurrs low to the ground or in trees) and the spatial requirements of Manumea are understood so that threats can be identified and appropriate conservation management actions undertaken. Our project aims to provide a detailed analysis of the status, distribution and ecological requirements of this endangered species.

Because most land in Samoa is under customary ownership local consultations and education regarding the Manumea are critical for enabling conservation actions. Furthermore because both habitat loss and hunting are likely to be contributing to the Manumea's decline, it is critical to engage the support of village matai (chiefs) in order to limit the impact of these threats. So far three communities have indicated that they would like to be involved with Manumea conservation, but they have limited means and knowledge to be effective. This project will involve consultations with key individuals in villages and conservation education to develop a sustainable plan of action to empower them to be involved with ongoing Manumea conservation.

The recovery of the Manumea will take time and needs an organisation behind the project that will target its needs over the long-term. There is currently a 'fledgling' NGO in place with the support of multiple organisations and with experienced people involved. The NGO itself is new and needs support. Therefore, we are also undertaking capacity development support for the Samoan conservation NGO that will in turn contribute to the sustainability (and legacy) of the project for the future.

Study area − Samoa is dominated by two large volcanic islands, Savai'i and Upolu, which lie in the South Pacific. Both islands are over 1,000 km2 and are mountainous with a maximum elevation of 1,900 m. The main wet season is December to March. See Figure 1.

Fig 1, Location of Samoa in the south pacific. Samoa is made up of two islands Savai'i and Upolu

2. Project Partnerships

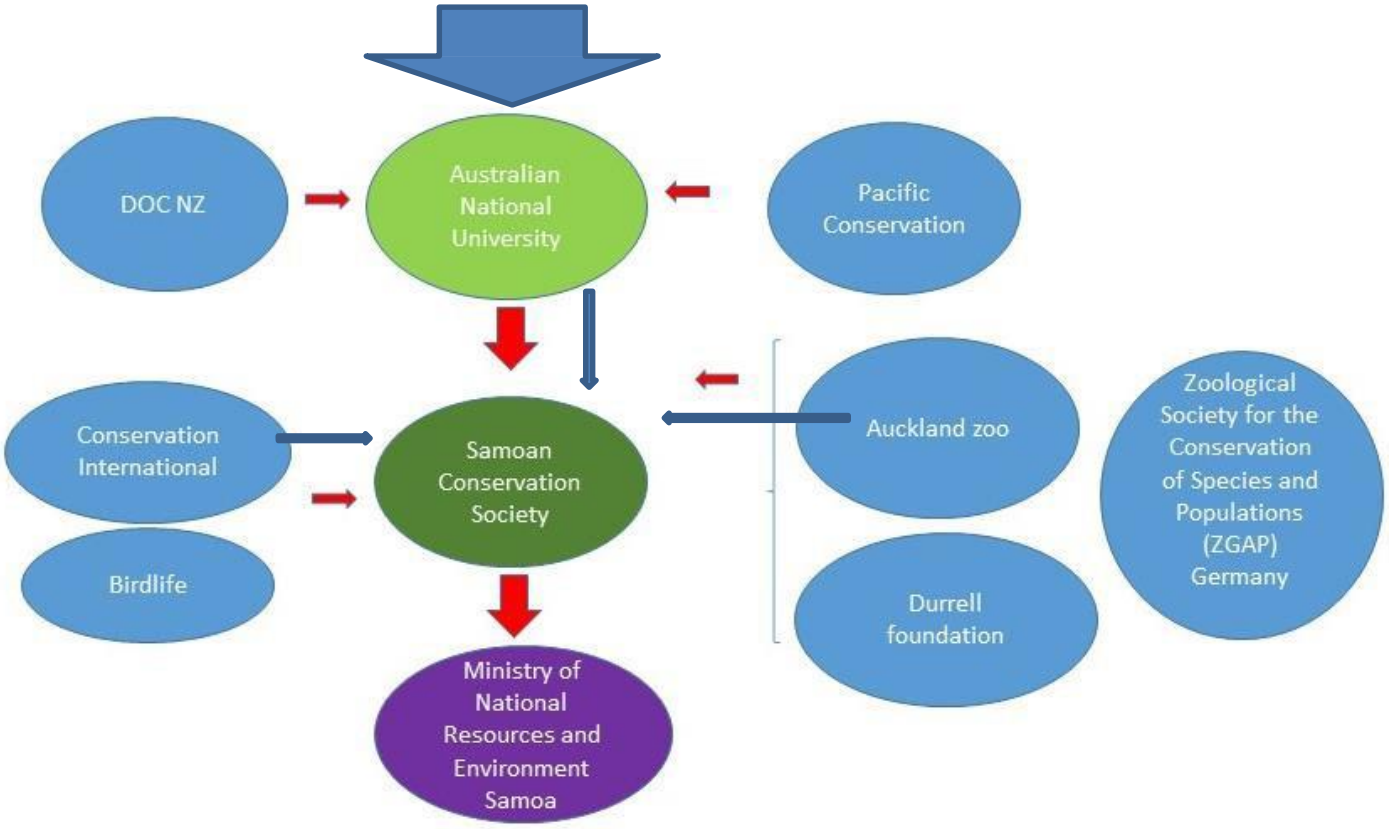

Fig 2. Relationships between lead and partner organisations and the point of contacts (indicated with red arrows). Blue arrows indicate fund flow.

This project is based within a framework of support from multiple organisations. The diagram above describes the relationships between the different organisations involved in this project and their point of interaction. Australian National University (ANU) as the lead organisation is managing the funding received from DEFRA and is the point of contact with the DEFRA Darwin grant staff. ANU have a MOU with the Samoan conservation society (SCS) who are providing operational support for the project in Samoa. Enhanced capacity and development of

this fledging NGO is one of the project objectives. SCS have a staff member employed and an office under the project.

Rebecca Stirnemann is the Research Fellow employed by ANU using Darwin funds. She works under the supervision of Prof Robert Heinsohn (ANU) and is based out of the SCS offices in Samoa while implementing the project.

The SCS has formed a partnership with the Samoan Government's major environmental government body, the Ministry of Natural Resources and the Environment (MNRE). The MNRE aids project liaisons with local villages and customary land owners, and provides on the ground support and expertise. MNRE has staff with field experience who will continue to benefit from learning additional field skills over the course of this project. The project will also benefit from their previous experience in the field. Project planning occurs between the three main partnerships (ANU, SCS, MNRE) with input from the associated partners as required. Experts and core staff from all three organisations meet regularly (every 3-6 months) to maintain information flow between the organisations.

SCS have also attracted additional funds in association with the project. This includes funds from Conservation International where the new NGO's offices are currently based and some further funds from Auckland Zoo to cover some field equipment (extra transmitters).

Pacific conservation, the Department of Conservation (DOC) New Zealand, Auckland Zoo, Birdlife, the Durrell foundation and ZGAP are also working to aid the project. Pacific Conservation and Auckland zoo will be providing on the ground expertise when required, especially for helping capture Manumea and during educational phases. Others will provide expert knowledge as required. For example one partner, the Massey vet school (NZ) provided training on how to test for diseases such as *Trichomoniasi* in pigeons. Other partners such as the Durrell wildlife conservation trust (who saved the pink pigeon in Mauritius) and Birdlife Pacific are aiding in the NGOs development. We expect more of these partnerships to form as the project develops and the capacity of the local NGO increases.

3. Project Progress

3.1 Progress in carrying out project activities

Output 1

Activity 1.1 Manumea surveys undertaken and monitoring plan developed

This is the biggest part of the project and the most complex. Initial surveys have allowed areas where the Manumea are present to be identified. Two sites have been identified on each of the two islands (Savaii and Upulo) as being of high priority. One site is village land and the other is a combination of village and government watch catchment. Four additional sites have been identified for further monitoring to establish their importance for the species. Additional information is being sought to build a better understanding of the species' biology. One

mechanism is by using all available information from museums with ornithology collections. To this end museums around the world are being contacted to determine if they hold Manumea specimens. Specimens are measured *in situ* and the information on the data labels collated. Already this has added to our knowledge of the timing of the breeding biology of the target species and some reproductive parameters (e.g. clutch size). Appropriate habitats with known pairs are now being targeted to determine detectability and optimal monitoring times for the species. Further, Manumea surveys will be completed when baseline data on the species' optimal detectability times, spatial coverage and seasonal patterns in movements have been determined by tracking the birds using transmitters.

Activity 1.2 Sites identified where further research/conservation can occur

Some initial sites have been identified. Further information from radio-tracking Manumea is required to determine if there are seasonal patterns in spatial use and preferred habitat features. This information will also be used to verify key habitats and sites. We are currently mapping areas where *Dysoxylum,* a key food species for the Manumea, is present to determine the extent how much they affect spatial use by Manumea.

Activity 1.3 Radio tracking of Manumea

Transmitters have been designed, purchased, and are now ready to be attached to Manumea in the upcoming months. Methods of capture will be refined with the aid of two expert teams from Auckland Zoo and Pacific Conservation. They will join teams in Samoa to decrease the time required to capture and attach the first radio transmitters to these rare species.

Output 2

Activity 2.1 Sites selected for future conservation effort

Sites to best target conservation effort are still being selected. It is important to consider not only the presence of Manumea but also the ownership of the land, the quality of the forest, and accessibility of the sites.

Activity 2.2 Development of cat/rat control program

Expert advice is being sought for the development of an invasive pest control plan. We are forming a specialist group to determine the optimal design for undertaking invasive pest control of both cats and rats. Members of the German Zoological Society, Auckland Zoo and Pacific

Invasive Institute (PII) have all been approached to join the group. Such a targeted invasive species control program must be based on solid knowledge of the timing of the breeding season and other biological data. We are currently discussing with experts which methods which could be trailed and implemented.

Output 3

Activity 3.1 Development of short educational program on Manumea and forest preservation

We have formed a partnership with the Samoan government and Auckland Zoo education specialists to undertake consultations with villagers and design an effective educational outreach program. The educational program is still being designed and will be combined with the invasive species control program to ensure project participation by key villages. After consultations with Auckland zoo educational specialists we decided not to use the conventional advertising route (posters, brochures etc.) to spread our message. Instead we plan to promote education of key villages by involving them directly in the project, where some individuals would become conservation leaders within their local areas. We are also in discussion with some groups who use theatre as an educational tool. Some trial school visits have also taken place to determine if this is an effective mechanism for bringing about awareness and changes in attitude and behaviour.

Activity 3.2 Discussions with key village chiefs over the preservation of forest and reduction of pigeon hunting

We are combining activity 3.1 and 3.2, in partnership with the Samoan government, to undertake the village consultations and design an effective educational outreach program. The educational program is being designed to ensure that there is appropriate participation in the project over all. Surveys have been undertaken to determine the key messages to be used in the educational program. Techniques to spread the key messages are being determined in collaboration with communications specialists in SPREP and Auckland Zoo education experts.

Activity 3.3 A native tree planting program to benefit Manumea in collaboration with the Forestry Department

This activity will occur later in the project.

Output 4

Activity 4.1 Additional staff hired and trained for SCS

An additional staff member has been hired by the NGO.

Activity 4.2

Funds applied for to ensure a sustainable future for the organisation

Three proposals for funds have been submitted to ZGAP, National Geographic and global forest watch small grants fund. These have provided training for the NGO in obtaining small grants, thus providing extra revenue and motivation to apply for grants in the future.

Progress towards project outputs

Output one, Research into the biology of the Manumea and threats to the species is currently being undertaken. This is the biggest part of the project and the most complex. Initial surveys have enabled areas where the Manumea are present to be identified. Appropriate habitats with known pairs are now targeted to determine detectability and optimal monitoring times for the species. We need to collect this information at sites where the birds are present in order to establish population estimates. Initial surveys showed that because this species is so rare standard methods of detectability such as repeated point counts would be ineffective. This caused an additional research section to be added to the project. We are currently determining detectability in areas where birds are known using automatic sound recorders. Variability in detectability over a day can then be determined for known individuals so the optimal times for surveys can be established and population size can be estimated. This can be used to estimate population size which can then be used to form a baseline to measure the population's response to conservation efforts and external forces such as cyclones.

Recording an individual's Manumea's call has an additional benefit of building a library which will be used for playback to capture individual birds. Transmitters have been designed, purchased, and are now ready to be attached to Manumea in the upcoming months. Methods of capture will be refined with the aid of two expert teams from Auckland Zoo and Pacific Conservation. They will join teams in Samoa to decrease the time required to capture and attach the first radio transmitters to this rare species. During capture we will also swab for *Trichomoniasi*, a disease which has been shown to impact other endangered pigeon species (i.e. pink pigeon). Transmitters will allow information on spatial use and key habitat requirements to be determined so the targets of Output 3 can be reached. Scientific results will be published in peer-reviewed papers (Indicator 2).

Overview of indicators for output one:

Indicator 1 Revised recovery plan which incorporates biological information on the species

- Project still in the process of under taking research on the basic biology of the species. The recovery plan will be based on this information.

Indicator 2 Peer reviewed papers submitted on the biology of the Manumea

- Gathering the data on the basic biology of the species and its detectability. Scientific papers will be an output of the research.

Indicator 3 At least 3 Manumea tracked with radio transmitters

- This phase of the project is still to occur (see above).

Indicator 4 At least 5 new sites identified where Manumea conservation effort can be targeted

- Two sites have been identified (see appendix)
- Further sites are still to be determined.

We are adding an additional output to this section:

Indicator 5 Methodology for a monitoring program for Manumea developed

- Detectability is currently being calculated for the Manumea.
- The initial surveys to determine where individual birds were located have been done. (See survey in the appendix).

Output 2 invasive pest control plan development and 3 reducing hunting of Manumea are still in the development phases. Some potential sites have been identified (Indicator 2). Further information is required on spatial use and habitat requirements of the Manumea to confirm the appropriateness of these sites.

Output 2 Management of invasive species (targeted species established in output 1) trialled, and management plan established

Discussions with experts at PII, Auckland University, ZGAP and Auckland Zoo have taken place. These organisations have all agreed to aid in both educational outreach and design. However all partners agree that information from Output 1 is needed to provide additional information to ensure that invasive species control (Output 2) to insure the best impact.

Indicator 1 Sites established where monitoring can occur

- First site still to be confirmed based on the biology of the species (spatial use and habitat selection). Possible sites have been identified

Indicator 2 Invasive management trialled at one site

- Plans are still being drafted.

Indicator 3 Working paper outlining the success of the techniques submitted to the Ministry of Natural resources

- This will be the last thing to be developed and will form part of the management plan for the species.

Output 3 Pigeon hunting bans and logging restrictions for key areas developed with key village participation.

Further surveys are needed to determine to what extent hunters are aware of the differences between these species and whether this is affecting their hunting practices. Initial surveys indicate that in some villages the value of Manumea is acknowledged and hunting of this species is avoided, while Pacific pigeon hunting continues. However, in at least one area hunting of Manumea and Pacific pigeons are still occurring and no discrimination was made between the species. This will be one of the areas we will target for community discussions and education. Protection of sites may not be as effective as the direct education of the hunters in reducing Manumea hunting. We may therefore change methods slightly to achieve our overall aim of reducing Manumea hunting. Therefore **Indicator 1,** increased protection of sites recorded in minutes of village meetings, may no longer be an appropriate measure of this output. A survey before and after discussions might

be a better method for tracking changes in peoples' practices and thinking. The Durrell foundation is currently seeing if they can provide a course for all the in country project participants in survey techniques including design and analysis since this is a key gap in our teams' skills. We are also discussing implementing a nationwide competition to educate people in general about the Manumea.

Output 4 The capacity of the local conservation NGO (the Samoan Conservation Society) has been enhanced

This output is successfully occurring as the project progresses. The NGO now has a project office and staff and has received additional funds in association with the Manumea project. A website is under development increasing the profile of the organisation. Progress is measured using a tracking tool. We have established a baseline of the organization's current status, identifying its major strengths and weaknesses against which future performance may be tracked. We use a formal tracking tool, the Civil Society Tracking Tool, to measure **indicator 1 - Improve the local NGOs (SCS) capacity in working with threatened species conservation action and management.** Progress has been slow in building the NGO. This was partly expected since the NGO was dependent until this point on volunteers who all had full time jobs.

3.2 Progress towards the project Outcome

The project's outcome was stated as: the establishment of methods, based on sound ecological knowledge, which will halt the decline of the Manumea and its habitat and the support of the community to implement these methods.

We are currently undertaking the required research to determine a method to monitor the Manumea population. This will form a baseline against which success over the long term can be measured. We are also undertaking field work to understand the threats to the species and develop appropriate conservation action based on a sound ecological knowledge of the species (Indicator 1). Capture methods are currently being refined. This will inform the design of indicator 2, the management of invasive species and what additional communities need to be targeted for indicator 3. Initial discussions with some key villages (Indicator 3) have already taken place. Indicator 4, increasing the capacity of the local NGO, continues to occur as the project is growing. The indicators are adequate for measuring the outcome.

The project is currently on track and should reach its goal by the project deadline.

3.3 Monitoring of assumptions

The following assumptions have been made for this project:

Assumption 1	Natural disasters (cyclones) do not prevent access to key sites and lead to the complete disappearance of the species and staff turnover remains manageable
Assumption 2	No new invasive species present with potential to decrease Manumea population
Assumption 3	Target communities remain open to working with the project
Assumption 4	That we will receive the funds needed to do this work

All these assumptions hold true and for the most part there is little we can do to alter them. We will however maintain sensitive staff management and continue to apply for additional funds, to prevent as best we can assumptions 1 and 4 becoming an issue. We will continue to work through the government to ensure the target communities remain open to working with us and remain sensitive to their needs.

3.4 Impact: achievement of positive impact on biodiversity and poverty alleviation

Our project aims to save the Manumea from extinction, thus contributing to Aichi Target 12, which states that "by 2020, the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline has been improved and sustained." Saving the Manumea will also involve preserving native forest which contains a rich fauna and flora of native species, thus contributing to Aichi Target 11. Thus this project will contribute to the CBD through the conservation of biological diversity it will also increase the sustainable use of components of biological diversity by reducing hunting pressure on the Manumea by working with the local communities hence contributing to Aichi target 1.

We are working with the Samoan NGO, SCS, and the MNRE to build local capacity and skills in terrestrial conservation management. The SCS and MNRE work together to ensure that sustainable development in country (Samoa) is occurring.

4. Project support to the Conventions (CBD, CMS and/or CITES)

As above

5. Project support to Gender equity issues

This project works with both men and women in villages and within the environmental sector to ensure conservation action is not gender biased. Men and women also have equal chances of developing skills through training of both MNRE and SCS staff.

6. Monitoring and evaluation

This past year has focussed on developing internal organisational systems to monitor the project and to develop indicators of the achievements. The project team have:

1. Incorporated the project activities into the annual work plans of the organisations involved on the ground (MNRE, SCS and ANU)

2. Clarified roles within the project teams

The project team has seen that meetings have to be held on a regular basis (quarterly), and has incorporated this into the project annual work plan. A team has been formed (with ANU, MNRE and SCS members) that meets every three months to advise the project and ensure that all stake-holders are informed of developments.

The project leader is undertaking interim evaluations during implementation as a first review of progress, a prognosis of a project's likely impacts, and as a way to identify necessary adjustments in project design. A secondary independent evaluation will be undertaken by the team every 6 months to identify any further changes that need to be made to the project. Terminal evaluations will be conducted at the end of each section of the project so that appropriate adjustments can be made to the project plan with the new knowledge which has been gained throughout the study.

7. Lessons learnt

Working with the different NGOs and government groups has been inspiring. We are lucky to have some very dedicated people. We have been careful to develop MOUs and have open discussions of expectations to ensure everyone is happy and feels like they contribute to the project. Thus far this has worked well and we have not had any substantial problems.

We would recommend other groups also developing clear MOUs with partners and have discussions of expectations prior to the project starting. The only budget item that was unexpected was the additional funds now required for overnight allowance for government staff.

Our only problem is the new allowance set from within government is five times higher than previous overnight stipends and was not required when we wrote the budget. We are now applying for additional funds from ZGAP to cover this cost. However other than this minor issue we continue to feel supported within a body of distinct groups with a shared aim of saving the Manumea and its habitat.

8. Actions taken in response to previous reviews (if applicable)

Not applicable yet. This will be reported in the next year.

9. Other comments on progress not covered elsewhere

As the project is progressing and we learn more about the requirements of this endangered species we are refining the methods we are using. For instance we are currently determining detectability using a different method then was previously anticipated, repeat point counts and replaced with detectability of known individuals. Information gained from observing and tracking Manumea will also allow us to assess which invasive species are affecting their survival and enable us to develop and trial output 2, management of invasive species.

10. Sustainability and legacy

This project already had a strong profile in country and internationally. Mongabay ran two stories about the plight of the species and other stories have been released in local newspapers and on ABC radio. We also officially launched the project along with the British consulate, Brenda Heather Latu, on environment day. The project's launch was featured in the local newspapers and on the radio. We have also featured the project on the SCS website, social media sites (twitter and facebook) and in documentation such as newsletters to the local NGOs supporters. We attended and presented at the 2014 International Ornithology conference in Tokyo, Japan (see appendix).

We plan a major media release with the first Manumea capture to aid in developing support. There is considerable interest in this project because we have been approached by a number of people (Conservation NGOs) asking how they can aid our project and the NGO.

The capacity of the NGO is also increasing and its development continues to be a valid exit strategy as long as funding can be continued. This will be influenced by the success of this project which remains our key goal. Continual input by outside organisations should also enhance the development of the local NGO and its potential to take over the conservation of the Manumea and Samoa's forests as a key goal in the future.

11. Darwin Identity

The project has been publicised at the small island development forum, and in the newspapers, radio and websites as well as on social media sites. We will be increasing coverage upon the tagging of the first birds since as the Manumea is the last of its genus this is likely to be a story of considerable interest both within and outside Samoa.

The Darwin Initiative was seen as a distinct project but is enabling us to form a larger program with these funds in the core. The partners associated with the project all have a good understanding of the Darwin Initiative. Other NGOs also seem to be familiar of with it.

We have linked the Darwin Initiative to all our tweets on the project.

12. Project Expenditure

Table 1 Project expenditure during the reporting period (1 April 2015 – 31 March 2016)

Project spend (indicative) since last annua report	2015/16 Grant (£)	2015/16 Total Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)				N/A
Consultancy costs				/
Overhead Costs				Delays in expenditure processing
Travel and subsistence				Delays in expenditure processing
Operating Costs				Delays in expenditure processing
Capital items (see below)				Delays in expenditure processing
Others (see below)				Delays in expenditure processing
TOTAL	**46,928**	**63,429**		

13. OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum). This section may be used for publicity purposes

We agree for the Darwin Secretariat to publish the content of this section.

Our project has successfully determined key sites in Samoa where the Manumea or tooth billed pigeon can still be found. All other species in this genus in Tonga and Fiji are already extinct, and numbers are low and declining in Samoa. The Manumea remains a mysterious bird and little is known about its biology. However now that sites have been determined we can study the species and the underlying reasons for its decline. At key sites we will be capturing and radio tagging Manumea for the first time. Radio transmitters will be attached to the back of Manumea with a backpack design. This will allow us to follow individual birds to determine threats to the species and the critical areas that need protection. Sound recorders are currently being used to determine the species' detectability from its calls so that when combined with new information from the radio transmitters an accurate estimate of population size can be made.

This project aims to reduce biodiversity loss in Samoa by preventing the continual decline of the Manumea, its associated forest habitat and other biodiversity that occurs in these areas. The formation of partnerships between the Ministry of Natural resources and the Environment, the Samoan Conservation Society, a local NGO, local communities, and the Australian National University are fundamental to the success of this project.

Appendix 1: Report of progress and achievements against Logical Framework for Financial Year 2015-2016

Project summary	Measurable Indicators	Progress and Achievements April 2015 - March 2016	Actions required/planned for next period
Impact This project aims to reduce biodiversity loss in Samoa by preventing the continual decline of the Manumea and its associated forest habitat.		Initial sites containing Manumea have been located. Partnerships have been formed and the NGO developed.	[redacted]

Outcome The establishment of methods, based on sound ecological knowledge, which will halt the decline of the Manumea and its habitat and the support of the community to implement these methods.	**Outcomes indicators** 1) At least 5 new sites have been identified for future conservation of the Manumea, >30% of forested areas in Samoa will be surveyed for Manumea, More than 3 Manumea have been tagged and radio tracked, position of nests have been identified 2) Management of invasive species trialled in 1 area 3) Increased number of sites given increased protection from hunting and logging agreed upon by community groups. Population metrics of pigeons (not only Manumea) in protected areas increasing 4) The number of experienced and trained permanent staff has increased	1) Some sites containing Manumea have been located and mapped. In these sites, where known individuals are present, detectability is being calculated. Calls are being recorded to build a database of Manumea calls for capture. 2) Sites for invasive species being identified and consultations with experts under way. 3) Initial consultations have begun on pigeon hunting and awareness of differences between the pigeon species. 4) One new staff member brought onto project.	1) We will be attaching transmitters to Manumea to determine their spatial use and track them to learn more about their basic biology. 2) Determine detectability of Manumea and associated factors. 3) Confer with communities and develop plan for engagement 4) Continue building the NGOs capacity 5) Attend the IICB conference to present our work.
Output 1. Research into the biology of the Manumea and threats to the species is currently being undertaken	Peer reviewed publications, surveys, project report, videos, Recovery plan, maps, photos	These continue to be good indicators though some like the scientific peer reviewed publications will take time to produce.	
Activity 1.1 Manumea surveys undertaken and monitoring plan developed		Initial surveys have been undertaken and a monitoring plan is being developed. Currently we are doing research into the detectability of the species and factors that may affect call rate. We have also reviewed all the information and literature produced on this species up to this point and have collected further information from Museum specimens from around the world.	
Activity 1.2 Sites identified where further research/conservation can occur		Initial sites have been identified for further consideration.	

Activity 1.3 Radio tracking of Manumea		Radio transmitters have arrived in Samoa and we will be trialling capture methods in the upcoming months.
Output 2. Management of invasive species (targeted species established in output1) trialled and management plan established	Management plan, surveys, project report	These continue to be good indicators though some like the scientific peer reviewed publications will take time to produce.
Activity 2.1. Sites selected for future conservation effort		Some potential sites have been identified
Activity 2.2. Both cats and rats controlled in the 50ha area in the 6 week/ 2 weeks prior to the start of the breeding season		This activity is not yet scheduled to occur
Output 3. Pigeon hunting bans and logging restrictions for key areas developed through participatory methods with key villages.	Videos, village meeting notes, project report, videos, village's report	These indicators are not all valid. Villages do not tend to take meeting notes or make reports.
Activity 3.1 Development of short educational program on Manumea and forest preservation		Progress in the past year has shown that to make an impact, the project needs to assess if the hunting pressure varies on different pigeon species. We have altered our educational approach under the advice of conservation education specialists to educate the hunters rather than impose rules from the village which may not be able to be enforced.
Activity 3.2 Discussions with key village chiefs over the preservation of forest and reduction of pigeon hunting of specific sites		Initial surveys have taken place.
Activity 3.3 A local native tree planting program established to benefit Manumea in collaboration with the forestry department		This activity is not yet scheduled to occur. However we are currently mapping the locations of *Dysoxylum* to determine habitat requirements.
Output 4. The capacity for the local conservation NGO (the Samoan conservation Society) is enhanced	Project report, meeting notes	We are now using a tracking tool to monitor NGO development which is much more directly indicative of change then project reports and meeting notes.
Activity 4.1 An additional staff member has been hired by the NGO.		This activity has occurred and we are now developing her skills while we try to get funds to gain an additional staff member.

Activity 4.2, Funds applied for to insure the sustainable future of the organisation	We have recently applied for three additional grants to develop this project, conservation within Samoa and build the capacity of the NGO.

Appendix 2 Project's full current log frame

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Goal: Effective contribution in support of the implementation of the objectives of the Convention on Biological Diversity (CBD), the Convention on Trade in Endangered Species (CITES), and the Convention on the Conservation of Migratory Species (CMS), as well as related targets set by countries rich in biodiversity but constrained in resources.			
Outcome: The establishment of methods, based on sound ecological knowledge, which will halt the decline of the Manumea and its habitat and the support of the community to implement these methods.			
Outputs: **1**. Manumea biology and threats established with sites for further conservation effort selected	1a. Revised recovery plan which incorporates biological information on the species 1b. Peer reviewed papers submitted on the biology of the Manumea 1c. At least 3 Manumea tracked with radio transmitters 1d. At least 5 new sites identified where Manumea conservation effort can be targeted	1a. Review of current information on the species, surveys undertaken, recovery plan written, maps presented 1b. Peer reviewed publications 1c. Peer reviewed publications, project report, videos, Recovery plan, maps 1d. Recovery plan, maps, Peer reviewed publications 1e. Scientific paper, methods	1) Natural disasters (cyclones) do not prevent assess to key sites and lead to the complete disappearance of the species. 2) Staff turnover remains manageable.

	1e. A monitoring technique is developed for Manumea		
2. Management of invasive species (targeted species established in output1) trialled and management plan established	2a. Sites established where monitoring can occur. 2b. Invasive management trialed at one site. 2c Working paper outlining the success of the techniques submitted to the Ministry of Natural resources.	2a. maps 2b. maps, management plan 2c. Working plan	1) New invasive species present which wipes out Manumea population
3. Pigeon hunting bans and logging restrictions for key areas developed through participatory methods with key villages.	3a. Increased protection of sites 3b. Village groups self-reporting on success of venture submitted by yr 3.	3a. Videos, project report, maps	1) Target communities remain open to working with the project, 2) Hunting is still a problem for this species
4. The capacity for the local conservation NGO (the Samoan conservation Society) is enhanced	4a. SCS improve capacity in working with threatened species conservation action and management	4a. Progress in the past year has shown that to show change the project needs to use tracking tools.	1) Staff turnover remains manageable.
Output 1 Activity 1.1 Manumea surveys undertaken Activity 1.2 Site identified where further research/conservation can occur Activity 1.3 Radio tracking of Manumea Output 2 Activity 2.1 Sites selected for future conservation effort			

Activity 2.2	Both cats and rats controlled in the 50ha area in the 6 week/ 2weeks prior to the start of the breeding season
Output 3	
Activity 3.1	Development of short educational program on Manumea and forest preservation
Activity 3.2	Discussions with key village chiefs over the preservation of forest and reduction of pigeon hunting of specific sites as well
Activity 3.3	A local native tree planting program established to benefit Manumea in collaboration with the forestry department
Output 4	
Activity 4.1	Additional staff hired and trained for SCS
Activity 4.2	Funds applied for to insure the sustainable future of the organisation

Appendix 3 Standard Measures

Table 1 Project Standard Output Measures

Code No.	Description	Gender of people (if relevant)	Nationality of people (if relevant)	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
Established codes								
5	Training in fieldwork and surveys and administration of a project	F 2, M2	Samoan	1				1
9	Revised Manumea recovery plan			0				1
11B	Scientific paper			1				>2
12A	Computer database on Manumea locations			0				1
14B	MNRE and local university seminars			1				>2
14A	Conferences to be attended			1				>2
23	Additional funding leveraged							>3
4D	Village training		Samoan	0				5

In Table 2, provide full details of all publications and material produced over the last year that can be publicly accessed, e.g. title, name of publisher, contact details, cost. Mark (*) all publications and other material that you have included with this report.

Table 2 Publications

Title	Type (e.g. journals, manual, CDs)	Detail (authors, year)	Gender of Lead Author	Nationality of Lead Author	Publishers (name, city)	Available from (e.g.website link or publisher)

COMPOUNDING EFFECTS OF HABITAT FRAGMENTATION AND PREDATION ON BIRD NESTS	Scientific Journal & Conference abstract	Rebecca L. Stirnemann, Murray A. Potter 1, David Butler and Edward 0. Minot1	Female	Rebecca Stirnemann	Austral Ecology	Presented at the International Ornithology Conference Japan

Appendix 4 Onwards – supplementary material

Fig 3. a) Moe checking out the Manumea transmitters, b) checking the mist nets, c) Gaining village participation (Rebecca Stirnemann) in the project with the hope that this area could be established as a conservation site.

Fig. 4 a) Painting of Manumea produced for outreach by artist Michael Rothman.

SCS newsletter: b) Manumea banners used for outreach at the Small Island Developing States conference

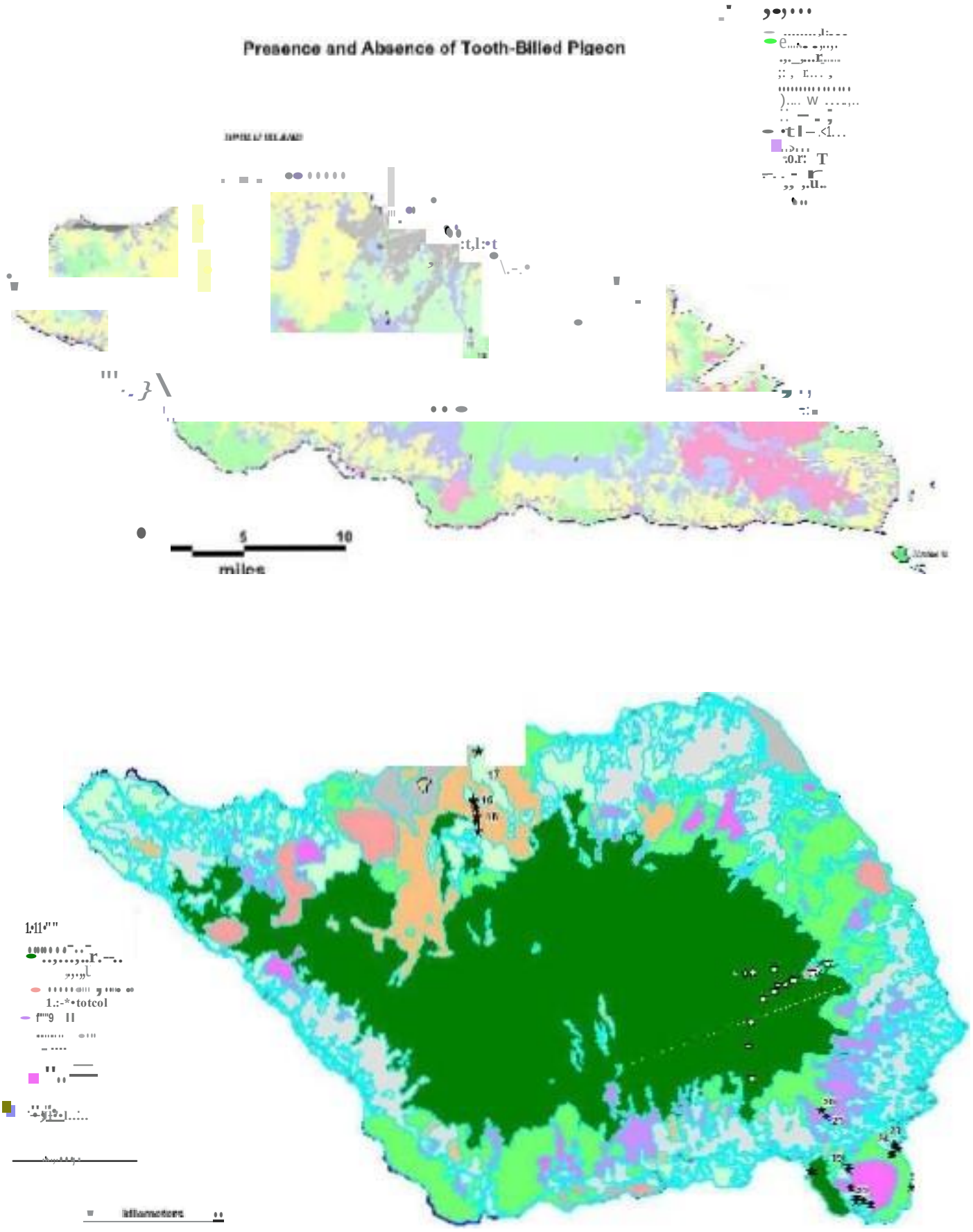

Fig 5. Sites W. Ore Morun"" h....., been reporled or ol>serWd in the lost 5 years a) runbered sles (Upoll) b) (block< stors SMI).

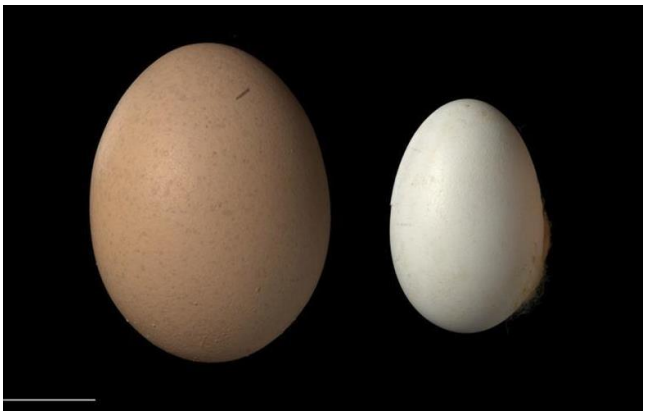

Fig 6. Manumea egg (museum specimen) in white compared in size to a chicken egg

ABSTRACT: International Ornithology conference, Tokyo, Japan August 2014: COMPOUNDING EFFECTS OF HABITAT FRAGMENTATION AND PREDATION ON BIRD NESTS

Habitat fragmentation and invasive species are two of the greatest threats to species diversity worldwide. This is particularly relevant for oceanic islands with vulnerable endemics. Here, we examine how habitat fragmentation influences nest predation by Rattus spp. on cup nesting birds in Samoan forests. We determined models for predicting predation rates by Rattus on artificial nests at two scales: (1) the position of the bird's nest within the landscape (e.g. proximity to mixed crop plantations, distance to forest edge); and (2) the microhabitat in the immediate vicinity of the nest (e.g. nest height, ground cover, slope). Nest cameras showed only one mammal predator, the black rat (Rattus rattus), predating artificial nests. The optimal model predicting nest predation rates by black rats included a landscape variable, proximity to plantations, and a local nest site variable, the percentage of low (<15 cm) groundcover surrounding the nest tree. Predation rates were 22% ± 13 higher for nests in forest edges near mixed crop plantations than in edges without plantations. In contrast, predation rates did not vary significantly between edge habitat where the matrix did not contain plantations, and interior forest sites (>1 km from the edge). As groundcover reduced, nest predation rates increased. Waxtags containing either coconut or peanut butter were used as a second method for assessing rat abundance. The rates at which these were chewed followed patterns similar to the predation of the artificial nests. Rural development in Samoa will increase the proportion of forest edge near plantations. Our results suggest that this will increase the proportion of forest birds that experience nest predation from black rats. Retaining large forest patches free of plantations will reduce nest predation by rats, but it is may not be sufficient for maintaining populations of predator-sensitive bird species on South Pacific islands.

1. BIRD SURVEY QUESTIONNAIRE.

The key aim of this questionnaire is to obtain indications of where Tooth-billed Pigeon are found but it also allows collection of data on other species. This survey is designed for an interview situation which
should proceed as below.

Date:
Interviewee:
Interviewer:
Sex:
Village:
Age range:
Coordinates: South:
West: Questions Responses/Answers

1. What do you know about the national bird of Samoa?
If known GO to 2.
2. Do you know the name of the bird?
3. Have you seen this bird? If YES GO to 4
4. Where and when? Where:
When:
5. How can you be sure it was tooth-billed pigeon you
have seen?
6. When was the last time you heard or seen this bird?
7. Can you describe what you know about this bird?
8. Do you know what tree(s) does it feed on?
9. Do you know the call of the bird? Explain
10. Do you know the behavior of the bird? Explain
11. Do you know other people who may know of the bird?
12. What is your opinion about birds?
13. Do you know if people are still shooting/hunting birds?
14. Have you heard or participated in previous or current
programs/projects to save birds of Samoa or relevant?
15. Would you be willing to help the team and other
programs which aim at conserving and protecting birds and their habitats?
16. If YES, how would you do so?
17. Any other comments?

Checklist for submission

	Check
Is the report less than 10MB? If so, please email to Darwin-Projects@ltsi.co.uk putting the project number in the Subject line.	yes
Is your report more than 10MB? If so, please discuss with Darwin-Projects@ltsi.co.uk about the best way to deliver the report, putting the project number in the Subject line.	no
Have you included means of verification? You need not submit every project document, but the main outputs and a selection of the others would strengthen the report.	yes
Do you have hard copies of material you want to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number.	no
Have you involved your partners in preparation of the report and named the main contributors	yes
Have you completed the Project Expenditure table fully?	yes
Do not include claim forms or other communications with this report.	