Darwin Initiative
Final Report

*To be completed with reference to the Reporting Guidance Notes for Project Leaders (http://darwin.defra.gov.uk/resources/) it is expected that this report will be a **maximum** of 20 pages in length, excluding appendices)*

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
Contract holder institution	The Australian National University
Partner institution(s)	The Samoa Conservation Society and the Samoan government, Birdlife, The Department of Conservation NZ, Auckland zoo
Darwin grant value	£229,842
Start/end dates of project	01 May 2014 – 31 December 2017
Project leader's name	Robert Heinsohn
Project website/blog/Twitter	WWW.SAMOANBIRDS.ORG @SAMOANBIRDS
Report author(s) and date	Robert Heinsohn 15/03/17

1 Project Rationale

The Manumea or tooth-billed pigeon is found only on the islands of Samoa and has until recently been listed as Endangered by the IUCN. Recent surveys in upland and lowland forest on both Upolu and Savaii confirm that Manumea numbers are extremely small. The species was consequently upgraded to Critically Endangered. A major cyclone (cyclone Evan) in December 2012 is likely to have further affected Manumea and other native bird populations. It became vital that the locations of any remaining populations of Manumea be identified to inform the targeting of conservation efforts. As stated in the Manumea recovery plan (MNRE, 2006) it is also critical that information on the breeding biology and the spatial requirements of Manumea are understood so that threats can be identified and appropriate conservation management actions taken. Our project aimed to provide a detailed analysis of the status, distribution, ecological requirements and threats faced by this critically endangered species providing the necessary information for development of a revised recovery plan and improved capacity for Samoan led on-ground conservation action.

Because the majority of land in Samoa is under customary ownership, local consultations and education regarding the Manumea are critical for their protection. Further, because both habitat loss and hunting of Manumea are likely to be contributing to the Manumea's decline,

it was considered essential to engage the support of village Matai (chiefs). Communities indicated that they would like to be involved with Manumea conservation, but had too limited means and knowledge to be effective. This project included consultations with the key individuals in villages and conservation education to help develop a sustainable plan of action to empower key communities to be involved with Manumea conservation.

The recovery of the Manumea will take time beyond the scope of the current project and needs an organisation that will continue to target its needs over the long-term. There are now two NGOs in place with the support of multiple organisations and experienced personnel. They are the Samoa Conservation Society (SCS) and Falease'ela Environment Protection Society (FEPS). Both NGOs are relatively new and have been in need of support to develop their capacity. This project includes capacity building support for the local NGOs so that they can contribute to the sustainability (and legacy) of the project in the future.

Study area – The nation of Samoa is dominated by two large volcanic islands, Savai'i and Upolu, which lie in the South Pacific. Both islands are over 1,000 km^2 and are mountainous with a maximum elevation of 1,900 m. The climate is marked by seasonality in rainfall with the main wet season falling from December to March.

Fig 1, Location of Samoa in the Pacific. Samoa is made up of two large islands Savai'i and Upolu as well as some smaller islands.

2 Project Partnerships

This project entailed an intricate network of support between multiple organisations (see Fig. 2). Relationships forged with each group resulted in multiple beneficial outcomes for the project and *vice versa*. These benefits included financial and in-kind support in the form of person-hours, expertise and equipment.

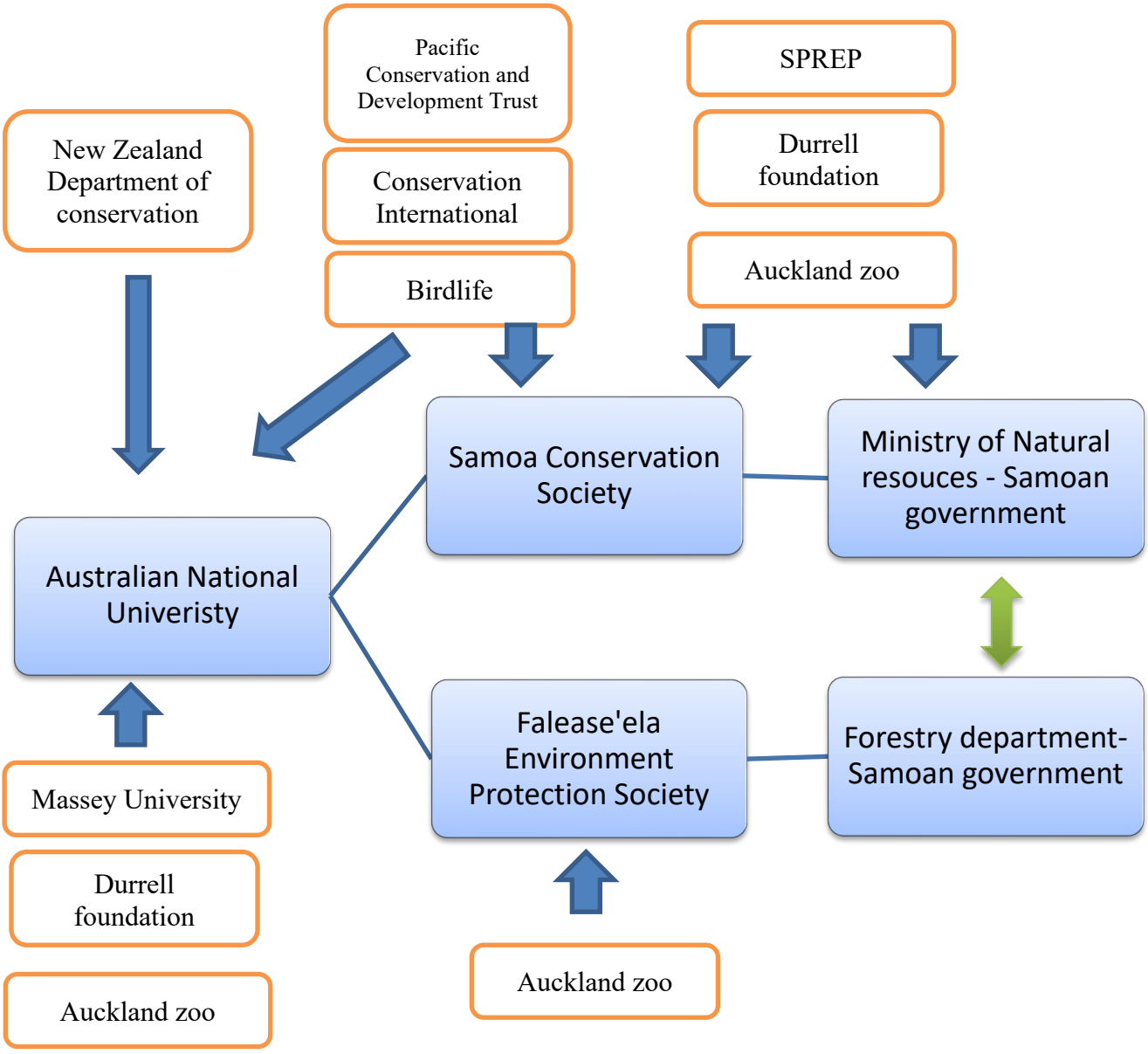

Fig 2. The relationships between the multiple organisations involved in this project.

The Australian National University (ANU) was the lead organisation including management of grant finances. ANU provided scientific, conservation expertise and project management in the form of a staff member (Dr Rebecca Stirnemann) who was predominantly stationed in Samoa in the SCS offices until the end of 2016. Funding to support her salary ran out in September 2016, and she was given Visiting Fellow status at the ANU until end of 2016 to enable her to complete some aspects of the project. ANU had an MOU with the Samoa Conservation Society (SCS) who provided operational support for the project in Samoa. A major objective of this project was to enhance and develop the capacity of SCS.

The SCS formed a partnership with the relevant government environmental department, the Ministry of Natural Resources and Environment (MNRE) of Samoa. The MNRE assisted with project liaison with villages and provided on-ground support and expertise. Some MNRE staff were also on the board of the Samoa Conservation Society. MNRE staff learned additional field skills over the course of this project and increased their networks with donors such as the Durrell Foundation and Auckland Zoo.

Over the last year of the project, the ANU also built another vital relationship for the project with the Falease'ela Environmental Protection Society (FEPS) who initiated forest restoration to provide additional habitat for the Manumea. This was made possible after running community engagement sessions and jointly conducting field surveys.

The ANU ensured the development and training of local people by forming a support network and directly mentoring local MNRE staff. This was achieved by forging the necessary networks and introducing talented individuals to scholarship opportunities. We worked with the Durrell Foundation in the development of a Darwin scholarship application for two such individuals, Fialelei Enoka and Moeumu Uili, who both worked on the Darwin project and for the Samoan government.

Auckland Zoo provided consistent support towards the project by providing expertise, funds, staff time and equipment. Their contribution along with The Department of Conservation in New Zealand, The Kiwi Trust and a private consultancy in Australia ensured the success of the sound recorder monitoring project by providing over 120 automatic bird recorders for the survey as well as staff time.

The Pacific Development Trust agreed to donate funds to SCS to undertake the first part of a pest control program. Auckland Zoo has also made a commitment to cover the additional funds needed to extend pest control over a three year period and to build in-country capacity in this regard. Furthermore Pelgar International provided free rat bait. ANU also worked with FEPS to help build their capacity and ensure they received further funding. Together they raised a grant for habitat restoration for the Manumea. They have also been working on an education resource in the form of an engaging children's book to highlight the importance of conservation, with a focus on the Manumea.

SCS have also attracted additional funds for the project, for example, funds donated by Conservation International and Auckland Zoo.

3 Project Achievements

3.1 Outputs

Output 1 – also see SCS Technical Report (Appendix 7)

Activity 1.1 Manumea surveys completed and a monitoring plan developed

Scientific research into the biology of the Manumea formed the largest and most involved part of the project and required development of novel techniques to deal with the species' cryptic nature and rarity. Initial studies identified areas where the Manumea persist. Individuals were followed to learn more about their behaviour and to try and find nests. One forested area in Upolu, Malololelei reserve, was well used by the birds during the fruiting period of *Dysoxylum sp.*, an essential food source. This area was idenitified as appropriate for implementing a pest control project.

An extensive survey using 72 automatic sound recorders was conducted on both large islands of Samoa. Additional information was collected on vegetation to determine the relationship between Manumea presence and habitat quality including plant fruiting times.

Additional surveys investigating the impact of hunting by humans and the drivers of this behaviour were also undertaken. These included an analysis of data exploring which people were consuming pigeons and other bushmeat. The results of this survey showed that consumption by the societal 'elite' contributes substantially to the decline of Manumea. These results together with an analysis of options for dealing with the issue, have been published in a scientific journal (see appendix).

By contacting museums with ornithological collections and assimilating all known data worldwide we collected information on the breeding status of each specimen thereby adding to our knowledge on the timing of breeding.

Activity 1.2 Sites identified for further research/conservation

Sites were identified for further conservation action. Faleaseela village was assisted in fund raising for habitat restoration including targeted planting of the tree species favoured by the Manumea. The village also established a nursery to grow native trees species favoured by the Manumea which are not currently produced by the Samoan Government Forestry Department. A site for pest control was selected near to Apia and funding support for pest control was secured for a further three years.

Activity 1.3 Radio tracking of Manumea

Transmitters were designed and purchased, however, despite many attempts it was not possible to catch Manumea. We therefore attempted to gain the information needed on the species' spatial use using an alternative method. Automatic sound recorders were placed simultaneously across the country in various habitats to determine movements and preferred habitat of Manumea. We collaborated with Massey University to automate the process of sorting through the data accurately, providing a valuable methodology which can be used to continue monitoring Manumea in the future. Our results showed that lowland forests were of critical importance for the species. Data analysis is underway to see if we can estimate population size and to determine how this methodology might be used to monitor other species. Results will be prepared for scientific publication.

Output 2 – also see SCS Technical Report (Appendix 7)

Activity 2.1 Sites selected for future conservation effort

Sites to target conservation efforts have been chosen (see above). It was 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 Cat/rat control plan developed/implemented

A control plan was developed with the aid of Auckland Zoo and SPREP, and the best position of bait stations was mapped. This plan was presented to the Samoan Government, and additional funds were gained via grant applications written during the project and meetings with potential donors. The Pacific Development Conservation trust (PDCT) and Auckland Zoo agreed to support a three year period of control. Initial bird surveys were conducted to form a baseline for future comparisons. Training of MNRE staff in New Zealand and then Samoa was arranged with Auckland Zoo. The Samoa Conservation Society and the local government are leading this activity.

Output 3 – also see SCS Technical Report (Appendix 7)

Activity 3.1 Development of educational program on Manumea and forest preservation

After consultations with Auckland Zoo education specialists, we decided that we would not use the conventional advertising route (posters, brochures, etc.) to spread our message. Instead, we would attempt education of inhabitants of key villages by involving them in the project so that

they could adopt and spread key messages and become conservation leaders within their communities. We also worked directly with hunters to increase local knowledge in an active manner. A children's book on the Manumea has been completed to help educate the children of Samoa about the Manumea. It is called *Mose and the Manumea*, was written by Jane vaafanga and Rebecca Stirnemann, and published by Little island Press. See http://www.mpp.govt.nz/news-and-stories/mose-and-the-manumea/
Discussions were held with TV1 about animating this story to increase reach across the country.

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

In conjunction with 3.1 above we partnered with the Samoan Government to undertake consultations with members of key villages and to design an effective educational outreach program. We determined that a clear understanding of the forest meat practices was needed to inform methodology for reducing the impact on Manumea of bushmeat hunting. Hunting surveys were designed in collaboration with social scientists to determine the contribution of bushmeat take to the decline of the Manumea. To gain an understanding of who was consuming pigeon meat we collaborated with the Samoan Statistics Department to gain access to the household income and consumption expenditure (HIES) dataset. This provided a large dataset which allowed us to determine statistically who campaigns should target to reduce impacts of hunting. These results have been published in a scientific journal (see attachment).

Activity 3.3 Establishment of a local native tree planting program in collaboration with the forestry department

This activity is currently being undertaken by FEPS a village run NGO. Following presentations by government staff member Fialelei Enoka and ANU staff the community set aside an area of land for forest restoration for the Manumea. The site was surveyed during the project to determine which native trees were present on the land and which invasive plants were a problem. Results showed that in areas such as Faleaseela with high cyclone damage the rubber tree is out-competing the native seedlings resulting in functionally reduced forest. FEPS is working on determining how to deal with this issue practically and will be trialling removal techniques. FEPS is also currently establishing a nursery to grow new trees needed by the Manumea not provided by the forestry department. They will plant these trees along with trees obtained from the forestry department in a specially designated Manumea reserve area. They also have an ecotourism project which is educating people on the importance of forestry.

Output 4 - also see SCS Technical Report (Appendix 7)

Activity 4.1 Additional staff hired and trained for SCS

Over the course of the project, two staff members were hired by SCS to work on the project, one to receive training on finance and the other on governance. Continual efforts were also made to train all staff associated with the project on fund raising techniques by collaboratively working on grant applications.

Activity 4.2

Funding to ensure the future operation of Samoan NGOs

Proposals for funds were submitted to ZGAP, National Geographic, Auckland Zoo and the PDCT. During the project, Juney Ward who was on the board and Posa Skelton also received grants for marine funding for the NGO including a large one from PEW.

3.2 Outcome

The project's major outcomes have been to establish key methods to halt the decline of the Manumea that are grounded in ecological and social knowledge. These will reduce destruction of habitat, restore habitat, control invasive species, reduce utilisation of Manumea, and provide support to communities to implement these methods.

Over the course of this project we developed a survey to monitor the Manumea using simultaneously monitoring automatic recorders. This method worked despite the species' cryptic nature and rarity because the recorders could record bird calls without the huge number of person hours required if observers are deployed for detection. Calls could be verified electronically to ensure there was no confusion between the pigeon species, Manumea and Lupe, a methodological issue previously identified by the government. We could also distinguish male versus female calls. The data collected during the sound recorder survey form a baseline against which conservation success over the long-term can be measured. We also undertook field work to understand the threats to the species and develop appropriate conservation action based on a sound ecological knowledge of the species and its threats. Hunting proved to be a substantial issue and effort was made to determine how this might be managed. The management of invasive species has been developed so that it can be carried out over a longer time period and area. Initial steps and partnerships to ensure success have been set in place. Discussions with members of some key villages on hunting and forest restoration were productive. Members of one village are now undertaking their own forest restoration targeted at helping Manumea. Younger people are being targeted with a campaign to enhance the perceived value of native species. Development of local NGO capacity continues.

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

Our project aims to save the Manumea, 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." The impact of our project is ensured by both identifying and targeting threats to the species, and working closely with local people to encourage and empower them to continue the program long-term. The impact of the project goes way beyond saving a single species from extinction as there are many benefits to both the environment and peoples' livelihoods.

4 Contribution to Darwin Initiative Programme Objectives

4.1 Contribution to Global Goals for Sustainable Development (SDGs)

The project has helped develop local capacity in two local NGOs and the Samoan Government. We have provided training and mentoring and, where talented individuals have been identified, opportunities for further professional training. Although not pitched at sustainable development *per se* this project encourages sound environmental management in the face of development pressures and global change.

4.2 Project support to the Conventions or Treaties (CBD, CMS, CITES, Nagoya Protocol, ITPGRFA))

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 native fauna and flora, 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.

4.3 Project support to poverty alleviation

The project has helped develop local capacity in both NGOs and government. We have provided training, mentoring and further growth. It works with both men and women in villages and within the environmental sector to ensure conservation action is not gender biased. Both males and females have had equal chances of developing skills through training of both MNRE and SCS staff.

4.4 Programme indicators

- **Did the project lead to greater representation of local poor people in management structures of biodiversity?**

Local capacity was enhanced.

- **Were any management plans for biodiversity developed?**

Yes, plans to control hunting of native species (see publication) and for pest control.

- **Were these formally accepted?**

Yes

- **Were they participatory in nature or were they 'top-down'? How well represented are the local poor including women, in any proposed management structures?**

Both top down and participatory.

- **Were there any positive gains in household (HH) income as a result of this project?**

Not measured, but some direct employment opportunities and training were offered.

- **How many HHs saw an increase in their HH income?**

Not measured.

- **How much did their HH income increase (e.g. x% above baseline, x% above national average)? How was this measured?**

Not measured

4.5 Transfer of knowledge

Knowledge was transferred in multiple ways including scientific papers and presentations aimed at international and local audiences, presentations and on-ground training aimed at local people, and widely circulated reports. Information was also shared in a children's book and through the media. Multiple presentations have been given to various stake holders.

Did the project result in any formal qualifications?

Two people, one male and one female, from the project will get formal qualifications via Darwin scholarships.

4.6 Capacity building

- One of the project staff was promoted to head of National Parks and Reserves during the project. Our main focus has been on capacity building via the NGOs.

5 Sustainability and Legacy

It is expected that many of the impacts of this project will be long term. The networks that have been forged continue to be critical, for example, the pest control program has momentum and backing by government and international organisations and should inspire other island nations and territories in the Pacific such as nearby American Samoa. We also expect that the government is now well placed to implement stronger policies and legal structures to reduce the impact of hunting of native species. It is expected that the two NGOs will continue to progress and the project staff will grow with them. Members of the NGOs involved in this project have been empowered in many ways, for example they now write and submit their own grant applications.

6 Lessons learned

The flexibility of the project was key to its success. We adapted methods, techniques, partners and interactions as we gained technical results, learned from what did not work, and found new partners. Relationships changed and developed as new personnel became available. The opportunity to build relationships with multiple organisations was also critical. Organisations such as Auckland zoo became partners after repeated productive interactions.

One difficult part of the project was the inadequate funding of the project leader's (Stirnemann) wage such that it ceased prior to the completion of the project. This required the project leader to contribute considerable time in a visiting staff capacity to maintain the project. We recommend any further projects fund the project leader for the entire project and if any extensions are given to any of the partners requiring a longer reporting period that additional funds for report writing are provided so the project leader is not negatively affected and having to take unpaid leave.

6.1 Monitoring and evaluation

The main change to the log frame was the additional task of developing a monitoring method for the species. We also employed a new methodology for monitoring spatial use after initial efforts at radio-tracking were shown not to work.

6.2 Actions taken in response to annual report reviews

The previous annual report reviews suggested:

1) That removing bushmeat as a meat source might not be beneficial to the local people
   We completed an analysis using scientific methods and produced a scientific paper to determine the impact the removal of bushmeat from the menu would have on the people of Samoa.
2) That we provide more evidence of the work completed and its impact.
   This is documented throughout this report including the final appendices.

7 Darwin identity

The Darwin Manumea project was recognised as a distinct project. We took all possible opportunities to link the project with the logo and to increase awareness. This was done through social media and blog posts as well as some newspaper articles.

The government of Samoa was familiar with the project and the donor. This awareness was highlighted by the joint application for funds to provide additional education to the two government people working on the project.

8 Finance and administration

8.1 Project expenditure

Project spend (indicative) since last annual report	2016/17 Grant (£)	2016/17 Total actual Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)			-6.03%	Delays in expenditure in Samoa
Consultancy costs				
Overhead Costs			-80.13%	Delays in expenditure in Samoa
Travel and subsistence			-46.10%	
Operating Costs			-100%	No workshops in this period
Capital items (see below)				
Others (see below)			-72.00%	Less expenditure incurred
TOTAL				

Staff employed (Name and position)	Cost (£)
Rebecca Stirnemann	
Samoa Conservation Group	
TOTAL	

Capital items – description	Capital items – cost (£)
TOTAL	

Other items – description	Other items – cost (£)

Consumables Batteries & Headphones SanDisk Memory Cards and Cables Computer Software Bank charges & Foreign Exchange Loss/Gains Postage & Freight	
TOTAL	

8.2 Additional funds or in-kind contributions secured

Source of funding for project lifetime	Total (£)
TOTAL	

Source of funding for additional work after project lifetime	Total (£)
TOTAL	

8.3 Value for Money

Appendix 1. Project's original (or most recently approved) logframe, including indicators, means of verification and assumptions.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Impact This project aims to reduce biodiversity loss in Samoa by preventing the continual decline of the Manumea and its associated forest habitat.			[redacted]
Outcome The establishment of methods, based on sound ecological knowledge, for halting the decline of the Manumea and its habitat, and support for 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, 2) Management of invasive species trialled 3) Increased number of sites given increased protection from hunting and logging agreed upon by community groups, Populations of pigeons (not only Manumea) in protected areas increasing 4) The number of experienced and trained permanent staff has increased		
Output 1. Research into the biology of the Manumea and threats to the species	1.1 Peer reviewed publications, surveys, project report, videos, maps, photos	1.1 Maps of surveys 1.2 Photos of fieldwork 1.3 Scientific papers- One paper published 1.4 One paper in development 1.5 One large dataset available	1.1 That we could adapt methods to undertake the research 1.2 That the bird was not already extinct or did not go extinct during our time period 1.3 that the government and communities supported the research 1.4 that the NGO supported the research and provided staff

Output 2. Management of invasive species (targeted species established in output1) trialled and management plan established	2.1 Management plan, surveys, project report	2.1 Dataset from museum available 2.2 Map of plan for pest control 2.3 Survey data baseline 2.4 Pictures 2.5 Funding confirmed for action 2.6 Meeting with government and presentation	2.1 That the government supports the project and that funding is gained 2.2 that the poison can be imported
Output 3. Pigeon hunting bans and logging restrictions for key areas developed through participatory methods with key villages.	3.1 maps, surveys, papers, photos, reports, media coverage	3.1 Scientific paper investigating the drivers of hunting and consumption 3.2 Forest restoration occurring in Faleseela 3.3 funding for Faleseela village is confirmed 3.4 Photos from field work with Faleseela and other village meetings about manumea and forest and hunting lose	3.1 There is local 'buy in' 3.2 That the government support hunting reductions
Output 4. The capacity for the local conservation NGO (the Samoa Conservation Society) is enhanced	4.1 Change indicators measured, more staff employed, NGO formalises strategic goals to an annual plan, NGO formalises the governance structure, NGO gains further funds	4.1 Change indicators measured 4.2 More funding gained	4.1 The NGO continues to gain funds 4.2 The NGO is well run by the board 4.3 The NGO wants to grow and interest is maintained 4.4 Staff turnover is manageable

Appendix 2. Report of progress and achievements against final project logframe for the life of the project

Project summary	Measurable Indicators	Progress and Achievements
Impact This project aims to reduce biodiversity loss in Samoa by preventing the continual decline of the Manumea and its associated forest habitat.		Knowledge of the species' ecology and threats has been enhanced. Conservation areas have been established and extent of threats determined. Small steps are in place to increase the Manumea's habitat. However our research identified hunting by humans as a key driver of the decline. We have isolated methods to deal with this issue but the government will need to lead initiatives.
Outcome The establishment of methods, based on sound ecological knowledge, to 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 surveyed for Manumea, 2) Management of invasive species trialled 3) Increased number of sites given increased protection from hunting and logging agreed upon by community groups, Populations of pigeons (not only Manumea) in protected areas increasing 4) The number of experienced and trained permanent staff increased	We have developed methodologies to address the three biggest threats to the species 1) habitat loss 2) invasive species and 3) bush meat hunting of other pigeon species. Item 2 will take place over a three year period. 1) Completed 2) All set up to undertake at a larger scale over the long term by SCS and MNRE 3) A few sites have being protected or established for Manumea however more are needed if the species is to be saved. 4) Completed
Output 1. Research into the biology of the Manumea and threats to the species	Peer reviewed publications, surveys, project report, videos, Recovery plan, maps, photos	Research into the species was undertaken with a broad scale simultaneous sound recorder survey occurring in Samoa to monitor the Manumea. Maps, photos, dataset and ultimately a scientific paper on the survey. The latter is still being developed. – also see SCS Technical Report (Appendix 7)

Project summary	Measurable Indicators	Progress and Achievements
Activity 1.1 Manumea surveys undertaken and monitoring plan developed		Completed
Activity 1.2 Sites identified where further research/conservation can occur		Completed
Activity 1.3 Radio tracking of Manumea		Shown not presentlypossible
Output 2. Management of invasive species (targeted species established in output1) trialled and management plan established	Management plan, surveys, project report	Map of planned pest control sites. Funding letters from PDCT and Auckland zoo. Presentation given to government in partnership with SPREP. – also see SCS Technical Report (Appendix 7)
Activity 2.1. Sites selected for future conservation effort		Completed
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		Funding arranged and design completed for a larger area and for long term (3 year+). Initial baseline survey complete. Control still to occur under MNRE and SCS. – also see SCS Technical Report (Appendix 7)
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	Survey completed on hunting with an outline of methodology for reducing the activity and consumption completed. Forest restoration targeting Manumea is occurring. Funding for local conservation NGO to undertake this completed. – also see SCS Technical Report (Appendix 7)
Activity 3.1 Development of short educational program on Manumea and forest preservation		A children's book on Manumea is close to completion and a short cartoon for publication nearly completed. Village visits have been completed.
Activity 3.2 Discussions with key village chiefs over the preservation of forest and reduction of pigeon hunting of specific sites		Completed.
Activity 3.3 A local native tree planting program established to benefit Manumea in collaboration with the forestry department		Funding gained and land set aside by Faleseela NGO (FEPS).

Project summary	Measurable Indicators	Progress and Achievements
Output 4. The capacity for local conservation NGO (the Samoa Conservation Society) is enhanced	Project report, meeting notes	Completed. – also see SCS Technical Report (Appendix 7)
Activity 4.1 An additional staff member has been hired by the NGO.		Completed
Activity 4.2 Funds applied for to insure the sustainable future of the organisation		Completed

Appendix 3. Standard Measures

Code	Description	Total	Nationality	Gender	Title or Focus	Language	Comments
Training Measures							
1a	Number of people to submit PhD thesis	0					
1b	Number of PhD qualifications obtained	0					
2	Number of Masters qualifications obtained	0					
3	Number of other qualifications obtained	5					
4a	Number of undergraduate students receiving training						
4b	Number of training weeks provided to undergraduate students						
4c	Number of postgraduate students receiving training (not 1-3 above)						
4d	Number of training weeks for postgraduate students						
5	Number of people receiving other forms of long-term (>1yr) training not leading to formal qualification (e.g., not categories 1-4 above)						
6a	Number of people receiving other forms of short-term education/training (e.g., not categories 1-5 above)						
6b	Number of training weeks not leading to formal qualification						
7	Number of types of training materials produced for use by host country(s) (describe training materials)						

Research Measures		Total	Nationality	Gender	Title	Language	Comments/ Weblink if available
9	Number of species/habitat management plans (or action plans) produced for Governments, public authorities or other implementing agencies in the host country (ies)						Participatory process?
10	Number of formal documents produced to assist work related to species identification, classification and recording.						
11a	Number of papers published or accepted for publication in peer reviewed journals	1 with 2 more in development					
11b	Number of papers published or accepted for publication elsewhere	1					
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country						
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country						
13a	Number of species reference collections established and handed over to host country(s)						
13b	Number of species reference collections enhanced and handed over to host country(s)						

Dissemination Measures		Total	Nationality	Gender	Theme	Language	Comments
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	10	Conference/workshop	F	Pacific Conservation, Invasive	English,	

Dissemination Measures		Total	Nationality	Gender	Theme	Language	Comments
			Conservation	M&F		English/Samoan	
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.	10	Samoan, Samoan, New Zealand	F, M, F	Conservation in the Pacific, Invasive Species, Conservation	English	

Physical Measures		Total	Comments
20	Estimated value (£s) of physical assets handed over to host country(s)		Unknown exactly however included a computer, desks and chairs and field equipment
21	Number of permanent educational, training, research facilities or organisation established		
22	Number of permanent field plots established	72	Please describe. 72 automatic sound recorder locations were established to form a baseline to monitor population change.

Financial Measures		Total	Nationality	Gender	Theme	Language	Comments
23	Value of additional resources raised from other sources (e.g., in addition to Darwin funding) for project work	7		Female	Conservation	English	

Appendix 4. Aichi Targets

	Aichi Target	Tick if applicable to your project
1	People are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.	yes
2	Biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.	yes
3	Incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.	yes
4	Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.	
5	The rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.	In progress
6	All fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.	
7	Areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.	
8	Pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.	
9	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.	In progress
10	The multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.	
11	At least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.	
12	The extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.	In progress
13	The genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.	

	Aichi Target	Tick if applicable to your project
14	Ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	
15	Ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.	In progress
16	The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.	
17	Each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.	
18	The traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.	yes
19	Knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.	yes
20	The mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.	

Appendix 5. Publications

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Nationality of lead author	Nationality of institution of lead author	Gender of lead author	Publishers (name, city)	Available from (e.g. web link, contact address etc)
Scientific paper	**Interactive impacts of by-catch take and elite consumption of illegal wildlife**, 2017	New Zealand	Australia	female	Biodiversity and Conservation, Springer,	Stirnemann RL, Stirnemann IA, Abbott D, Biggs D, Heinsohn R (2017) Interactive impacts of by-catch take and elite consumption of illegal wildlife. *Biodiversity & Conservation* doi.org/10.1007/s10531-017-1473-y
Scientific paper	**Compounding effects of habitat fragmentation and predation on bird nests, 2015**	New Zealand	New Zealand	female	Austral Ecology, Wiley	Online http://onlinelibrary.wiley.com/doi/10.1111/aec.12282/abstract
Children's book	*Mose and the Manumea*, Jane Vaafanga/Rebecca Stirnemann, 2018.	Samoa	Samoa	female	Little island Press	See http://www.mpp.govt.nz/news-and-stories/mose-and-the-manumea/

Appendix 6. Darwin Contacts

Ref No	21-001
Project Title	Developing a conservation management plan for Samoa's little dodo- the Manumea or tooth-billed pigeon
Project Leader Details	
Name	Robert Heinsohn
Role within Darwin Project	Project supervisor
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Fax/Skype	
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Role within Darwin Project	Project leader in Samoa
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Partner 2	
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Partner 3 etc.	
Name	Moeumu Uili
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Role within Darwin Project	MNRE liaison
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