

# **DRAFT PROJECT PLAN**

## **RESTORATION OF NU'UTELE & NU'ULUA ISLANDS, SAMOA**

### **1.0 ERADICATION OF PACIFIC RAT (*Rattus exulans*)**

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&  
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#### **Executive Summary:**

The islands of Nu'utele and Nu'ulua have been identified as highly significant sites for conservation in Samoa. They hold large populations of species currently found nowhere else in the country including threatened land-birds, seabirds and nesting turtles. They also are the only offshore islands large enough and far enough offshore to be considered as refuges for several of the nation's species threatened on the larger islands by introduced mammalian pests. Such refuges have assumed greater importance as recent severe cyclones (Ofa – 1990, Val – 1991 & Heta – 2004) have reduced bird and bat numbers.

A key step towards the restoration of these islands is the eradication of the only mammalian pest known to be present, the Pacific or Polynesian Rat (*Rattus exulans*). This eradication is feasible. Experience overseas has shown that removing this species would be very beneficial for the native fauna and flora occupying the islands and for other species that might be transferred there for their conservation.

The local people who use the islands have given their initial support to rat eradication as part of a larger, successful marine protected areas project along that section of coast. Eradication needs to be followed by a community-led programme to prevent rats reinvading the islands.

The proposed method for eradication is by distribution of baits containing the toxin brodifacoum. Both islands have areas of high cliffs which require the spreading of baits using a helicopter. However no helicopters are in the country so one will need to be shipped there as a significant part of the project costs.

The islands are the key sites in the country for one threatened species, the Friendly or Shy Ground Dove (*Gallinula stairi*). This is likely to feed on bait fragments and

be at risk of poisoning. Preventing the loss of this species from the islands becomes a key issue for this project and the plan is to temporarily confine birds at a safe site for the duration of the operation.

A further issue has emerged that needs to be addressed as part of the restoration programme for these islands. Within about the past three years the Yellow Crazy Ant (*Anoplolepis gracilipes*) appears to have 'irrupted' on Nu'ulua with vast numbers active throughout the forest day and night and it may have already led to significant changes in the island's ecology. It has not yet been detected on Nu'utele though it is present in parts of the main island of Upolu but not apparently in an irruptive phase there. The control or eradication (and preventing re-invasion) of the Yellow Crazy Ant needs to be the subject of further research and discussion and is the subject of a second plan.

Opportunities to combine rat and ant management need to be investigated later, not least because aerial poisoning may be the preferred option for addressing the ant problem. Eradicating the rats on Nu'ulua seems of reduced value if nothing is done about the ants there. Restoration of the island requires both to be under control. On Nu'utele, rat eradication has more merit on its own as the ants are not apparently a problem, though how long this will be the case is hard to predict.

This plan identifies the necessary tasks and the people or agencies to undertake them to complete a fully-costed Operational Plan for this project that can be used to apply for the funding required and undertake the work.

## **1.0 Introduction:**

This document should be read alongside another document 'Draft Project Plan - Supporting Information – April 2005' and the 'Draft Project Plan – Ants'.

### **1.1 The Islands**

The islands of Nu'utele and Nu'ulua, two of the Aleipata Island group situated off the eastern end of Upolu Island, Samoa have long been identified as key sites for conservation. Pacific Rats were trapped on Nu'utele in 1991 and their elimination was identified as desirable at that time (Park et al 1992). Rats were located for the first time on Nu'ulua in 2003 (Butler, 2003).

The two islands lie far enough offshore, Nu'utele at 1.3 kilometres from the Aleipata coast and Nu'ulua further out, for rat eradication to be considered as a worthwhile option as animals are unlikely to be able to get back to them unaided. Pacific Rats are very poor or reluctant swimmers (R. Parrish pers. comm.). Ship Rats (*Rattus rattus*) are stronger swimmers but Norway Rats (*Rattus norvegicus*) are the best, capable of covering 2km in special circumstances (R. Parrish, pers. comm.). Both of these species are present on Upolu.

Nu'utele (108ha) is the highly eroded remains of a tuff cone that was originally circular in shape, but due to erosion, various portions of the rim are now gone (Whistler, 1983). Hence, Nu'utele has steep to vertical terrain (high point is 200 metres), which is broken by a series of bluffs (Bell, 2000). On the north and west

sides of the island are steep marine cliffs up to 180m high (Whistler, 1983). The vegetation covering the whole island is native or only partially disturbed, with a relatively open understorey, only a few vine tangles and limited ground cover (Bell, 2000). However there is a small plantation area on the island supporting vegetable species and coconuts (at Vini) and chickens have been introduced by a local family.

Nu'ulua (25ha) is similar to Nu'utele in its geology, a tuff cone breached on the eastern side by the sea though its cliffs are not so high. Its vegetation is also similar though one plant species is found nowhere else in the country. Both islands have limited safe access spots due to the cliffs, fringing reefs, and predominant wind and wave conditions. Nu'ulua is the more rarely visited due to the much greater difficulty of landing and it is thus less modified, with very few coconuts for example. More details of the vegetation and fauna of both islands are available in Park et al. (1992).

## **1.2 History of conservation**

The first project addressing the conservation of these islands was undertaken in 1994 with funding from UNEP's Regional Seas Programme. It carried out questionnaire-based surveys of marine resources, held three sub-district meetings discussing management of coastal resources including the islands, and produced educational resources.

A major 5-year project entitled the Samoa Marine Biodiversity Protection and Management Project (MPA), funded by the IUCN, began work in January 2000 in the Aleipata and Safata districts. One of its key achievements at Aleipata has been the development of a Management Plan for the Aleipata Marine Protected Area for 2002–2006 which has been agreed to by the district. This lists as one of its priority working goals that “by the end of 2006 our offshore islands (Nu'utele and Nu'ulua) will have had a restoration programme designed and begun implementation focusing on rat eradication, and endangered bird life (land and sea bird) and other native wildlife conservation and overall security of these islands for heritage conservation (natural and cultural)”.

Ownership of the islands rests with key matai (chiefly) titles in the villages of Aleipata and all claimants have endorsed the islands as being part of the MPA and thus covered by the management plan.

The MPA project was completed at the end of June 2004. However the protected area initiative will continue. The communities have recently established the Aleipata and Safata MPA Incorporated Society along with a trust fund to support the ongoing work. The French Coral Reef initiative has pledged significant support for the region's MPAs from Jan 2005. [**This needs updating**]

## **1.3 History of rat eradication proposal**

Initial funding of \$US45,000 was received from AusAID in 2000 to support the rat eradication as a demonstration project for the region. A portion of this money was used for an initial feasibility study in July 2000 (Bell 2000) and a preliminary survey of birds, lizards, invertebrates, weeds and rodents on Nu'utele and Nu'ulua (Stringer et al, 2000) at the same time. A second pre-eradication monitoring survey was

undertaken in June 2001 leading to a further Feasibility Study being prepared by Faafetai Uitime that year which examined the proposal from the Samoan perspective (Stringer et al., 2001). A third pre-eradication survey was undertaken in June this year carrying out trials with non-toxic baits, doing further trapping and collecting more information on birds, reptiles, weeds and ants (Butler 2003) (Parrish et al, 2003).

During the 2003 expedition to Nu'ulua it was found that the forest floor was covered in fast moving ants later identified as Yellow Crazy Ants, and they were also seen in trails on all tree trunks. Infra-red video showed that ants were also active in similarly large numbers at night. Those who made the earlier visits to the island had not noticed this phenomenon and it is assumed to have been a recent development.

A recent positive development has been the adoption of this programme as a 'demonstration project' by the partners of the Pacific Programme of the Cooperative Islands Initiative (PP-CII). The PPCII will be providing technical advice and assistance to the project and seeking funding through its partners.

## **2.0 Justification:**

The need for the rat project is identified in Samoa's National Biodiversity Strategy and Action Plan, the country's key conservation strategy, within an action recorded as: 'Develop a programme for the eradication of rodents from small islands which can be used for conservation of rare species such as the tuameo (Friendly Ground Dove)'.

Rat eradication would be justified in terms of the current biodiversity values of the islands alone, but it is this opportunity to use them as predator-free refuges for safeguarding the nation's whole fauna that makes it so desirable. Species currently present include a number of internationally threatened endemics: the Tooth-billed Pigeon (*Didunculus strigirostris*) (endemic; endangered), Friendly Ground Dove (regional endemic, vulnerable), Samoan Broadbill (*Myiagra albiventris*) (endemic, vulnerable), Coconut Crab (*Birgus latro*) (vulnerable) and Samoan Flying Fox (*Pteropus samoensis*) (endemic, endangered). The two islands also hold the only significant seabird colonies in the country including Red-footed and Brown Boobys (*Sula sula* and *Sula leucogaster*), Black Terns (*Sterna sumatrana*), White Terns (*Gygis alba*), and Great Frigatebirds (*Fregata minor*).

Research in New Zealand there has shown that the removal of Pacific Rats can bring about improvements in vegetation and quite dramatic increases in reptiles, invertebrates and some birds that nest in or on the ground (the ground dove and many of the seabirds fall into this category), or in holes low in trees. Rats are likely to have been responsible for the absence of burrow-nesting seabirds on the islands – several species of shearwater and petrel should be present and possible burrows were identified in 1992 though no birds found. Higher numbers of ground doves are likely if rats are removed.

There are several other Samoan birds whose status is a concern and for which rat predation may be the key threatening factor. One such is the Maomao (*Gymnomyza samoensis*) a giant honeyeater now endemic to Samoa after becoming extinct on American Samoa. Others suggested in earlier reports are the Island Thrush (*Turdus*

*poliocephalus*) and the Samoan White-eye (*Zosterops samoensis*). These could be transferred to Nu'tele and Nu'ulua to help ensure their long-term survival.

A final justification for the project and one reason it has the support of regional conservation agencies like SPREP is its potential role as a demonstration project for the South Pacific. Showing that rat eradication and ant control/eradication can be done successfully and safely, and bring about positive changes in island biodiversity, will strengthen the region's ability to make more such projects happen. This in turn would do much to safeguard a significant number of threatened species, particularly birds.

### **3.0 Feasibility:**

A variety of rodent species have now been successfully eradicated from a wide range of islands throughout the world, many of them very significantly larger than Nu'utele and Nu'ulua. While most programmes were initially in temperate regions with New Zealand taking a leading role in the southern hemisphere, a range of tropical islands have recently been treated including ones in the Seychelles, Mauritius, Cook Islands, Tonga and Kiribati.

The initial Feasibility Study indicated that it was possible to eradicate rats from Nu'utele Island, though the initial budget of \$US45,000 was clearly inadequate (Bell, 2000). It favoured manual baiting as posing less risk to non-target species. Since then rats have also been found on Nu'ulua and it is most cost-effective to treat the two islands together. Given that studies have suggested eradication to be feasible on Nu'utele, it is clearly achievable on Nu'ulua which is smaller with easier terrain. The current proposal, developed after wide discussions and a further visit to the islands, is for aerial application of baits combined with ground application of limited areas.

## **4. Proposed Operation**

There has been considerable discussion and expert input to date leading to the proposed approach outlined here. Some of that discussion is presented in a document entitled 'Supporting Information' to accompany this plan.

It is proposed to carry out an aerial drop of grain-based baits containing the toxin brodifacoum on both islands with provision to ground-lay extra baits in any gaps and in high rat/crab density areas if required. This technique has been proven to work in many parts of the world including the tropics. It requires the temporary shipping of a specially equipped helicopter with an experienced 'aerial drop' pilot from New Zealand. Preliminary details of timing, bait type and quantities are included in 'Supporting Information' though these may change once a 'drop supervisor' becomes involved.

This approach has been carried out with minimal side-effects (non-target effects) around the world. However the rare Friendly Ground Dove could theoretically be put at risk here and a specific programme to protect it is being organised. This involves catching and housing the birds temporarily in captivity during the poison drop and releasing them once the baits are no longer toxic (see Supporting Information for

discussion and details of operation). An expedition to trial capture and holding techniques is planned for 2005.

### **4.3 Monitoring**

#### **4.3.1 Result monitoring of rat population**

Assuming that the whole of each island is treated from the air, then initial monitoring will largely monitor baits not rats, i.e. determine first that there has been a good spread of baits and hand-fill any gaps, and then determine the rate of bait take/deterioration to time the second drop. Specific monitoring to ensure enough baits are present for long enough on the beach/plantation areas of Nu'utele would also be needed.

The approach taken with many aerial operations in New Zealand then involves re-visiting the islands after several months to check for the presence of rats, then doing so after two years at which point an operation is formally declared a success if not rats have been detected since the drop.

However it is suggested that trapping is used to monitor rats as staff will need to remain on the islands after the eradication to assess when the Ground Doves can be released (below). Given the problems with coconut crabs robbing traps of baits and rats (Butler, 2003), mesh cage traps would be used as on the Seychelles (Merton et al., 2003). The detail of trap lines and the frequency of the checking on each island can be determined later.

#### **4.3.2 Rat bait monitoring – to determine when Ground Doves can be released:**

Baits will be monitored in enclosures, as in the Seychelles (Merton et al. op.cit.) to determine when they are fully broken down and the doves can be released.

#### **4.3.3 Outcome monitoring of benefits to native biota:**

The three visits by New Zealand experts focused on species likely to benefit from rodent control and provide approaches that can be used for some follow-up monitoring. Bird monitoring will be the key activity.

##### Bird monitoring:

Parks & Reserves staff had indicated that they could undertake forest bird monitoring using five-minute counts before and after the operation. A training programme leading to scheduled counts at Mt Vaia and O Le Pupu Pue National Park started and it was planned to extend this to Nu'utele Island, counting on a transect between Nu'utele and Vini beaches. However a key individual has left for three years training overseas and outside help will be needed with this.

Counts are not planned on Nu'ulua as it is intended to minimise visits to that island because of access problems.

Any changes in seabird numbers could be obtained through staff making detailed observations and counts were possible to compare with data sets already collected, largely by New Zealanders.

#### Reptile monitoring:

Recent work by R. Parrish and colleagues can be used to provide a rough baseline of lizard activity (Stringer et al., 2000) (Stringer et al., 2001) (Parrish et al., 2002), though it was designed to determine species diversity rather than to set up a quantitative monitoring system.

#### Invertebrate monitoring:

Earlier pitfall trapping (Stringer et al., 2000) (Stringer et al., 2001) could be used to establish a rough baseline though the same comments apply as for reptiles.

#### Vegetation monitoring:

It is suggested that photopoints are established on both islands (the bird count stations on Nu'utele might provide suitable locations there). These would help document any changes in forest structure following the removal of the predation impacts of Pacific Rats. On Nu'ulua there may be some different effects associated with Yellow Crazy Ants – e.g. reduced crab numbers on Christmas Island due to ant predation has led to the development of a thicker understorey.

There is a possibility that weeds will increase in numbers after rats are removed. Ogle's recent reports may provide a baseline against which to assess this aspect (Ogle, 2001).

### **4.4 Preventing Re-invasion**

The likelihood of re-invasion is a very important criteria for determining whether an eradication should proceed or not. Both islands are far enough from the main island of Upolu for rats to be quite unlikely to reach them unaided. The greater risk may come from Ship Rats or Norway Rats which are stronger swimmers than Pacific Rats but this is beyond their known swimming range under normal conditions. Attention then turns to minimising the risks of them reaching the islands along with people. At the same time an early warning system would need to be set up on the island to detect and hopefully deal with any arrival of animals.

The Marine Protected Area project was going to be the key agency to work with the community in 2004 to minimise the risks of accidental transfers and prevent deliberate transfers. Clearly considerable trust and cooperation has been built up since the project started which has lead to community support for the removal of rats in the first place. Following the completion of the formal MPA project (June 2004) there will still be people in place to work with on preventing re-invasion, namely the Aleipata MPA Incorporated Society and Latu Afioga the local MPA manager. **[Needs to be updated]** It is suggested that the issue is approached by 'workshopping' with the district community the different ways that rats might reach the islands. For example, clearly each visit by people to either island poses a risk, but that risk is so

much greater if building or agricultural materials are transported as well. Different boats carry different risks. Ultimately it is up to individuals to take responsibility for their own boating.

New Zealand has well-developed rodent contingency systems for islands and many of the techniques would be transportable to the Aleipata situation. They would be likely to involve poison bait stations and traps set permanently alongside potential landing areas on the two islands, particularly Vini Beach, and maybe similar set-ups on the mainland in areas where boats might depart from. Stringer et al. (2000, 2001) & Ogle (2001) all recommended that hygiene plans be written and implemented for the islands addressing all animal and plant pests.

## **5.0 Restoration opportunities:**

Eradication of the rats will bring significant benefits for the existing biodiversity of the islands. However there are also opportunities to use these rat-free sites as refuges to other species that may be threatened on the main islands of Samoa, or the Samoan Archipelago as a whole.

Previous reports have mentioned several candidates, e.g. the Island Thrush (*Turdus poliocephalus*) and the Samoan White-eye (*Zosterops samoensis*) (Bell 2000). However there is now more information available on the status of Samoa's birds that has not been taken into account, particularly after a survey of upland forests (Schuster et al. 1999). A list of possibilities needs discussion but should be developed out of recovery planning for the country's threatened species.

One candidate to be considered is the Mao or Giant Honeyeater which was endemic to the Samoan archipelago but extirpated in American Samoa during the 20<sup>th</sup> Century. It is now rare on (Western) Samoa, only being found at 6 sites during the upland survey three on each island (Schuster et al., 1999). Overall it averaged only 0.08 birds per count, compared with Samoa's most well known endangered bird the Tooth-billed Pigeon or Manumea at 0.42 birds/count. The Mao is generally a cryptic, quiet species so its true status is hard to define.

It is almost certain that these islands once held significant populations of burrow-nesting seabirds such as Shearwaters and Petrels. Areas of ideal soil and 'departure trees' are present, particularly on Nu'utele, and some burrows present. All of the ones currently in use are occupied by Coconut Crabs but is possible that seabirds were present until very recently. Bell and others have had significant success at re-introducing such seabirds to previous localities. They are important not just in themselves but because their breeding stimulates local changes in invertebrate faunas and vegetation which increases the diversity of the islands.

A restoration plan will be developed as a separate exercise.

## **6. Work Plan**

This plan identifies tasks and those responsible for ensuring that they are carried out.

## **6.1 Project Development Phase**

This is the phase between completion of this plan and the production of a fully-costed operational plan signed off by all parties that can be used to obtain funding.

**Objective 1:** Obtain Government of Samoa sign-off.

Once the details of the operation are finalised it will need to be approved by the Samoan Government prior to seeking funding. Such approval would be signed-off by the Chief Executive Officer of the Ministry of Natural Resources and Environment. Prior to this it is likely to be considered by the Cabinet along with an environmental impact assessment (EIA).

The Project Manager, Tapa Suaesi, Principal Biodiversity Officer, Division of Environment and Conservation will submit the plan for approval.

**Objective 2:** Obtain local community's approval for the project and their suggested involvement.

The community of the Aleipata District have given their support in principle. They now need to be informed of all the technical details of the project to give their final approval. This needs to be done prior to submitting the operational plan for funding so that donors can see that it will clearly go ahead. There is a slight risk of raising the community's expectations and then finding that funding is unavailable, however this is considered very unlikely now that the PPCII (and thus its partners) are supporting this as one of their three demonstration projects in the region.

Tasks:

1. Compile relevant information on rat eradications and biosecurity<sup>1</sup> - PPCII staff are undertaking this.
2. Prepare appropriate information kits from the above (fact sheets and powerpoint presentation) – Project Manager/Technical Adviser, PPCII.
3. Translate material into Samoan.
4. Present material to community – Project Manager/Technical Adviser, MNRE staff (including marine section), PPCII?

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<sup>1</sup> DEC staff are concerned about several questions which probably also cover community concerns and thus need to be covered in this material:

- Are there enough rats there to be having a serious impact? (Need evidence from other examples of responses of fauna/flora to rat control)
- What are the likely impacts of any baits falling in the sea on the marine ecosystem - as the islands are part of a marine protected area? Any threats to nesting turtles? (Need evidence from spill of brodifacoum near Kaikoura, the Kapiti Is. Operation, any operations on turtle islands).
- Has there been a proper assessment of the island's biodiversity before the operation. (Need to summarise the surveys done of the islands from 1990 onwards)
- What will be the impact of poison baits on crabs?
- How do we estimate how much bait needs to be applied?
- What research will be done while the operation is proceeding?
- How does the 'spraying' work (Need video showing the dropping of baits)

**Objective 3:** Develop and obtain approval of an EIA as part of, or separate to, the Operational Plan

National EIA requirements are covered by the Samoa Lands, Surveys and Environment (EIA) Regulations 1998. There is a two stage process. First a Preliminary Environmental Assessment Report (PEAR) is submitted to the Director, MNRE. However this requirement can be waived if both the proponent and the Assistant Director for Environment agree that a full EIA is likely to be required. Given the nature of the operation including the use of toxins such a waiver should be obtained. A full EIA involves a scoping process and then the undertaking of the assessment by a 'person or organisation' 'independent and unbiased and shall be approved in advance by the Director in consultation with the Assistant Director for Environment. The assessment is then subject to a review including advertisement and public consultations.

Tasks:

1. Discuss waiving of PEAR requirement – project manager/SPREP/PPCII with Assistant Director
2. Agree with the Director on an independent entity to carry out the EIA.
3. Obtain quote for EIA production. PPCII and SPREP to develop TOR for EIA production and run past DEC for approval. Then advertise and select independent contractor.
4. Carry out scoping exercise and supply the independent entity with the information needed – Project Manager, Technical Adviser, PPCII.
5. Write up EIA and submit it to the agreed process – Independent contractor, Project Manager.
6. Obtain approval – Project Manager.

**Objective 4:** Identify other Government of Samoa requirements for project approval.

Tasks:

1. Check requirements from Pesticides Board, Airport Authority, Civil Aviation, Customs and obtain any approvals needed for import and operation of helicopter, import of poison baits – Project Manager, other MNRE staff.

**Objective 5:** Organise personnel and develop costings for Operational Plan

The following lists the anticipated personnel requirements.

Tasks

1. Personnel requirements to be agreed between project partners and costs identified and incorporated in Operational Plan - MNRE, SPREP, PPCII.

Project Manager:

It has been agreed that Tapa Suaesi, Principal Environment Officer, Ministry of Natural Resources & Environment will manage the project. He will need the support of a technical adviser.

Technical Adviser:

The Adviser would largely work in support of the project manager, helping to finalise the operational plan and then assisting in the detailed planning and coordination of the operation.

Aerial drop supervisor:

An experienced operator should be involved to coordinate the aerial spreading, liaising with bait supplier, helicopter company and organising the actual drops. There are several employees of the Department of Conservation with the relevant experience and their involvement could be sought by SPREP through its MOU with the department or through PPCII.

Aviculturist:

An experienced aviculturist would have the role of looking after the Friendly Ground Doves during temporary captivity and assisting with captures and releases.

Ministry of Natural Resources and Environment (MNRE) staff:

In addition to supplying the key role of project manager, the MNRE will provide other staff to participate in the operation through the expertise they can bring and the training opportunity the project represents. Daily allowances for work on the islands and some logistical funds will be required. The Project Manager has identified that two staff from each of the terrestrial and marine biodiversity sections, plus others from Parks & Reserves, land management, mapping and EIA would be involved.

A Technical Committee will be developed within MNRE to assist the Project Manager to organise project actions.

Villager and MPA local manager:

Villagers have assisted previous expeditions to the islands (boat transfers, catering on island) and it is hoped that they will continue to do so. The involvement of the Aleipata MPA District Committee and the MPA Officer within the marine biodiversity section at DEC will be important.

Field technicians:

Some support from experienced overseas-based technical staff may be needed to undertake the operation but the emphasis will be on using local staff as a training opportunity.

Observers:

Observers from other Pacific Islands are anticipated to be involved as part of the project's work as a 'demonstration'. Their air travel and allowances will need to be included in the budget. Depending on their skills and experience their presence may allow a reduction in the number of field technicians sourced from overseas. (SPREP are likely to fund this element).

**Objective 6:** Develop a project steering group and identify any funding required to support their activities.

It is suggested that project decision-making will be led by a Steering Group chaired by the Assistant Director for Environment with the following suggested composition:

- MNRE – Assistant Director
- District Committee – a representative
- SPREP
- Other representatives (?)

The project manager and technical adviser would observe/advise. PP-CII HQ would provide technical advice.

Tasks:

1. Agree on composition and role of steering group - MNRE/SPREP/PPCII.
2. Identify funding it will require to operate - Project Manager.

**Objective 7:** Obtain technical sign-off for Operational Plan by PPCII partners.

Tasks:

1. Circulate draft Operational Plan to partners and obtain feedback and incorporate - PPCII.

**Objective 8: Complete costed operational details for Plan**

### **8.1 Rat Baiting Operation**

Tasks:

1. Finalise helicopter quotes, including provision for spare parts, second spreader bucket, etc – PPCII, Aerial Drop Supervisor
2. Research any opportunities for other helicopter work in Samoa to share costs – Project Manager/Technical Adviser
3. Finalise quotes for supply, shipping and testing of bait including contract standards – Aerial Drop Supervisor
4. Obtain costing for safety material – Aerial Drop Supervisor
5. Quantify on-the-ground team needs – Project Manager/Technical Adviser
6. Determine means and costs of transport of baits within Samoa to location (to be defined) for helicopter loading – Project Manager
7. Finalise any costs and personnel requirements for ground fill-in, monitoring operation – Project Manager/Technical Adviser

### **8.2 Friendly Ground Dove Operation**

Tasks:

1. Obtain avicultural support and identify any associated costs – PPCII [Largely done – Auckland Zoo will support the project]
2. Trial capture and holding techniques and band birds for monitoring – Aviculturist, Project Manager/Technical Adviser
3. Cost cages, equipment, bird food - Aviculturist

### **8.3 Preventing Re-invasion**

Tasks:

1. Develop a rodent contingency plan, including identification of tasks for different people, incentives or penalties – Project Manager/Technical Adviser.
2. Quantify & obtain resources – for traps and bait stations, baits, etc. It is suggested that these are obtained as part of the eradication programme - Project Manager/Technical Adviser.
3. Develop information and publicity materials – signage, information sheets for villagers, fishermen, etc. - Project Manager/Technical Adviser.

**Objective 9: Complete baseline monitoring**

Tasks:

1. Establish bird transect, carry out initial five-minute counts and other surveys – Project Manager/Technical Adviser
2. Establish photopoints to assess response of vegetation – Project Manager/Technical Adviser

**Objective 10: Follow up on research opportunities**

PPCII seeks to promote research to maximise the potential gains from demonstration projects. There may be opportunities for Universities and science-based agencies to be involved and particularly students at University of the South Pacific and the National University of Samoa.

Tasks:

1. List possible questions that could be researched to advance IAS management and island restoration regionally – PPCII, Technical Adviser
2. Liaise with universities and research organisations to investigate opportunities for carrying out this research – PPCII, Project Manager (for NUS).

**Objective 11: Secure funding.**

Tasks:

1. Complete fully-costed Operational Plan – Project manager, Technical Adviser, PPCII
2. Identify possible funding sources, deadlines, obtain application forms, format proposal as required, etc. - PPCII
3. Submit application(s) – Project Manager.

**6.2 Operational Phase**

**Objective 12: Carry out rat eradication**

**Objective 13: Secure ground doves**

The detailed logistical tasks for this phase will be developed further in the Operational Plan and then form a work plan at the time of operations. The project manager, technical adviser, aerial drop supervisor and aviculturist would share out responsibility for tasks with technical assistance from PP-CII and others.

### **6.3 Monitoring & writing up phase**

#### **Objective 14: Monitoring Results of Rat Eradication**

Tasks:

1. Determine methodology to be used to monitor success of rat eradication as a potential 'best practice' for the region. (NZ leaves monitoring for two years as now confident of success. Need to research what is done in Indian Ocean.)  
Project Manager, Technical Adviser, PPCII, SPREP)
2. Cost chosen methodology for budget. Project Manager/Technical Adviser

#### **Objective 15: Post-operation Outcome Monitoring:**

Tasks:

1. Repeat bird counts at intervals – Project Manager
2. Repeat night-time video taken beforehand on both islands – Technical Adviser
3. Resurvey friendly ground doves using methodology established during capture operations – Project Manager, Technical Adviser, Aviculturist
4. Repeat the lizard work done beforehand (if it is quantifiable) – NZ-based experts
5. Re-take photo-point photos – Project Manager
6. Establish a methodology for monitoring large invertebrates and apply – PPCII, Project Manager, Technical Adviser
7. Assess the need to monitor bats (would they be likely to be affected by the operation positively, negatively) - PPCII

#### **Objective 16: Information Sharing:**

Tasks:

1. Debrief, review operation, write-up – Project Manager, Technical Adviser, Aerial Drop Supervisor, Aviculturist
2. Spread the word about the operation as a successful (we hope and expect!) demonstration project – PPCII, SPREP

### **7.0 Possible Timeline**

#### **30 April 2005**

1. Draft Project Plan completed and submitted to SPREP, MNRE, PPCII

#### **20 May 2005**

2. Comments on draft Project Plan received by Butler

#### **30 May 2005**

3. Project Plan completed

#### **June 2005**

4. Funds secured and activities to complete Operational Plan commence

## **July/August 2005**

5. EIA completed and Government of Samoa sign-off obtained –
6. Community sign-off obtained –
7. Baseline monitoring established –
8. Friendly Ground Dove trials completed –

## **September/October 2005**

9. Draft Operational Plan completed –
10. Peer review of Operational Plan
11. Operational Plan completed

## **November 2005 onwards**

12. Operational Plan submitted to funders

## **June-October 2006 (within this period)**

13. Shipping of baits and helicopter
14. Operation carried out

## **October 2006 onwards**

15. Post-operation monitoring
16. Contingency programmes in place to prevent reinvasion
17. Write-up of operation
18. Production of materials for use in regional advocacy

## **8.0 Budget: (New Zealand dollars)**

This section outlines the different budget elements needed. A few figures are added where known but detailed discussions are required to finalise it for funding applications.

### **1/ Project Development Phase**

#### **Planning**

- Expedition to establish bird and photopoint monitoring and to net and band Ground Doves
- Finalisation of Operational Plan.

#### **Consultation**

- Production of materials on eradications and their benefits.
- Meetings with MNRE staff.
- Consultations with Aleipata communities.

## **2/ Operational Phase**

### **2.1 Rat Eradication**

Toxic Bait: (Figures obtained from Animal Control Products in 2004 and need updating)

For aerial operation: 3.2 tonnes of Pestoff Rodent Bait 20R (20ppm brodifacoum) @ \$82.50 per 25kg bag (\$3.3/kg) = \$10,560

For any ground operation: Bait would be taken in 10kg bags for ground use at \$36 each (\$3.6/kg) but less bait would probably be used for a given area so overall costs would be similar.

Shipping ex-Auckland: \$350-750 depending on whether pallets or a container are used.

Other transport and documentation: figures to come

#### Helicopter:

Five New Zealand helicopter companies expressed an interest in preparing costings in 2004 and two provided these: one for \$72,000 and the other (prepared in March 2002 but considered by the company to not have changed much since) for \$65,000.

Note:

Other lower cost methods of obtaining a helicopter in Samoa have been suggested such as seeking the assistance of visiting Navies or tuna boats from nearby American Samoa. However even if the timing was right and there was enough forewarning for planning purposes, accurately spreading baits from the air requires considerable skill and pilots with some experience of this.

Attempts will be made to reduce costs by looking for other work that a machine could undertake while it was on the islands, thus sharing the expense of shipping it. It is several years since a commercial helicopter has operated in Samoa and there could well be opportunities like aerial survey, locating field teams, aerial photography, or lifting work. A number of different machines could do the bait spreading and it could be that the most cost effective solution will depend on other flying opportunities and the model required for them.

#### Other equipment:

Bait stations & tracking tunnels

Marking, flagging tape

Traps, bait stations, tracking tunnels for contingency work (preventing re-invasion)

## **3/ Monitoring & writing up phase:**

Local staff will need to be assisted by further visit(s) by NZ-based experts will be needed to repeat their data collection to confirm absence of rats and changes in native biota. Someone will need to be engaged to work with local staff to write up the project and produce material for use in regional advocacy.

## **Acknowledgements:**

A large number of people have been involved in this project to date, either in meetings, field expeditions or in commenting on proposals. All deserve mention to show the high level of support for this project. However I hope they will allow me to specifically name those who have had specific input into this proposal and to generalise beyond that.

Thanks then go to:

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