

RECOVERY PLAN FOR THE MA'OMA'O OR MAO (*Gymnomyza samoensis*)

SAMOA'S LARGE FOREST HONEYEATER



2006-2016

**Ministry of Natural Resources & Environment (MNRE)
Government of Samoa**



October 2006

Introduction to Recovery Planning

Recovery planning has been adopted internationally as a way of developing an agreed approach for the conservation of a threatened species. It provides an opportunity for all with knowledge of, or an interest in, a given species to contribute their ideas and agree on priority actions within a recovery plan.

A recovery plan provides confidence for funding agencies, and others interested in contributing time or expertise to aid a species, that all available information has been reviewed, all options for recovery considered and the best approach identified. Recovery Plans can also be used to raise public awareness about a species.

This plan will guide the Division of Environment and Conservation (DEC), of the Ministry of Natural Resources and Environment, the agency with responsibility for the conservation of Samoa's biodiversity, in its work. It also provides an opportunity for any other agency with an interest in bird conservation to identify what is needed to conserve the Ma'oma'o and work out how it can assist.

A small group drafted this plan over a 2-month period towards the end of an RNHP-funded project that also included nationwide surveys for the Ma'oma'o. A draft was presented at two national workshops (Annex 2), on Upolu on 29 September and Savaii on 3 October where support for its implementation was widely expressed. It was formally approved on ? [add date] by ? [add who approved]

A threatened bird recovery group is proposed to review the progress of this plan, another recently completed on the Manumea or Tooth-billed Pigeon (*Didunculus strigirostris*), and any future ones to be developed in Samoa. Comments and suggestions on the conservation of the Ma'oma'o are welcomed and should be directed to this group via the MNRE.

The format of this plan is based on guidelines produced by the New Zealand Department of Conservation. It is due for review in 2016, or sooner if new information leads to the need for a change in approach.

Cover Artwork (detail): George Bennett

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Foreword

It gives me great pleasure on behalf of the Government of Samoa to endorse this Recovery Plan for the conservation of the Ma'oma'o, or Mao (Samoa's large forest honeyeater). This plan, along with another being prepared for the Manumea, or Tooth Billed Pigeon, are the first species recovery plans ever prepared for any Samoan species, animal or plant.

The Ma'oma'o is a very important bird to Samoa and to Samoans. It is endemic to our islands (ie found no where else in the world), and has significant cultural and heritage value. Importantly, the Ma'oma'o plays a vital ecological role in the Samoan rainforests by pollinating the flowers of our native Samoan rainforest plants. Without this bird, and other honeyeaters, many rainforest plants would not be able to reproduce and would eventually die out.

Of considerable concern is that the Ma'oma'o is now rare and highly threatened. The Ma'oma'o is classified as Endangered by the IUCN, or World Conservation Union. This means that unless we take urgent action, this unique bird has a very high risk of going extinct in the near future. The Ma'oma'o is threatened by loss and deterioration of its native forest habitat and to a lesser degree hunting despite the national bans on hunting native birds and bats that have been in place for more than 10 years.

This important document sets out a series of objectives and actions that are necessary if we are to conserve the Ma'oma'o, and Samoan birds in general, for future generations to appreciate. Such objectives include managing a number of key forest areas where the bird is still found, eliminating hunting as a threat to the birds, establishing new populations of the birds, improving our understanding of the bird through ecological research, investigating captive breeding as a conservation tactic, increasing public awareness and education about the need for bird conservation, promoting the partnerships that are necessary to implement the plan and establishing a special bird recovery group to monitor and guide plan implementation.

This Government will do all it can to ensure that this plan is implemented. In addition, I urge all Samoans to play their part in conserving the native forest, planting native trees and refraining from hunting native birds. It is our duty to ensure that future generations of Samoans inherit from us islands that continue to be rich in healthy and functioning ecosystems, with the Ma'oma'o and other native birds continuing to play their essential role in sustaining our Samoan rainforest and delighting us with their colour and their unusual and beautiful calls.

Soifua,

Minister of MNRE

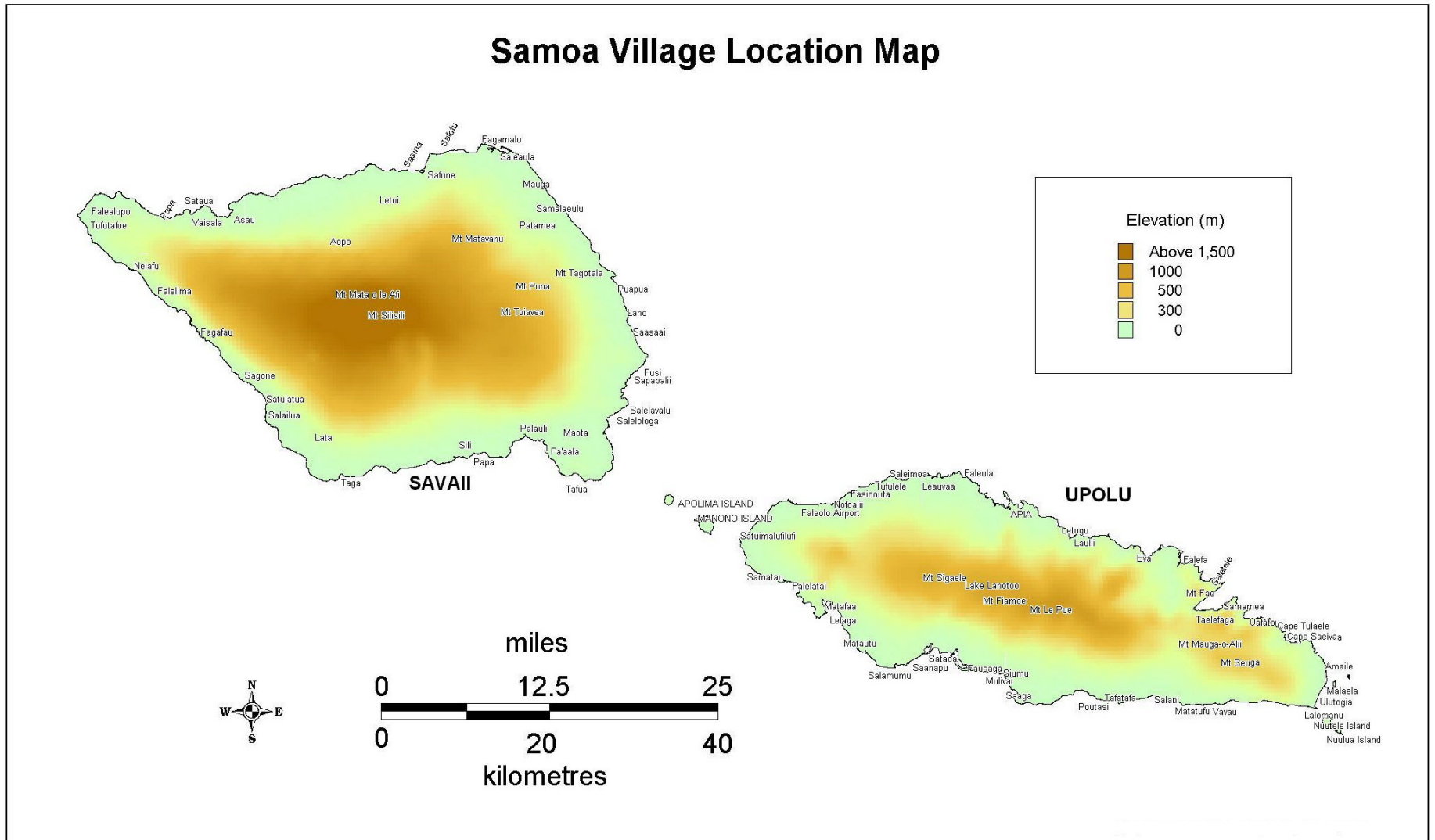


Figure 1: Map of Samoa showing Villages

EXECUTIVE SUMMARY

The Ma'oma'o or Mao is an endangered bird now found only in Samoa though it was once present in American Samoa. Two close relatives found in New Caledonia and Fiji are also threatened with extinction.

The Ma'oma'o lives in native forest where it eats nectar, insects and small fruit though it may feed on the flowers of introduced trees. Its numbers have declined dramatically, mostly through loss of forest habitat and it is now only found in a few areas largely at higher altitudes or in the upper parts of major river catchments.

Village consultations carried out during recent surveys showed that many people were not familiar with this bird, however there was strong interest in its conservation among those who knew it.

This Recovery Plan identifies a goal of securing the Ma'oma'o so it is no longer at risk of extinction, maintaining its existing populations on Upolu and Savaii, and re-establishing populations at former sites.

The plan has eight objectives. The first is to manage key forest areas on Upolu and Savaii which are the sites where significant populations of Ma'oma'o remain. There are five sites on Upolu including the upper Vaisigano River valley, two national parks and forests owned by Tiavea and Uafato and Matafaa and Falelatai villages, and one on Savaii, its upland forests. Detailed surveys are planned at some of these sites to identify changes in numbers. Research is proposed to find out more about the Ma'oma'o and threats to its survival. Two other objectives are to establish new populations on rat-free islands, new mainland sites and in captivity. The final three objectives focus on developing public awareness and education programmes, developing the partnerships and funding, and establishing a recovery group to carry out a plan of action over the next ten years.

About twenty different priority actions are listed which together will go a long way towards giving the Ma'oma'o a long-term future. This list enables anyone interested in helping with its conservation to see how they can best become involved. Note that while this plan lists the necessary actions to conserve the Ma'oma'o, some of the details of the actions, including performance measures, timing and source of funds, will be defined at a later date when detailed project proposals have been prepared for donor funding.

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The development of this Recovery Plan was carried out as part of a project supported by the Government of Australia through its Regional Natural Heritage Programme (RNHP). The project was managed by the Division of Environment and Conservation (DEC) of the MNRE with the technical support of the Wildlife Conservation Society (WCS) South Pacific Program (who also managed the funds as the implementing agency) and the Conservation International Pacific Islands Program (CI-PIP).

James Atherton, Dr David Olson and Linda Farley developed the project concept. Dr Ulf Beichle supervised and participated in the field surveys. Key MNRE staff were Faumuina Pati Liu (Assistant Chief Executive officer) the head of the DEC, Faleafaga Toni Tipamaa who was project leader (field survey) and Tapa Suaesi, project leader (community survey and awareness). The following additional MNRE staff undertook the field surveys and community consultations: Susau Siolo, Suemalo Talie Foliga, Samani Tupufia, Natasha Doherty, Eti Malolo, Iosefatu Jnr Reti, Nerissa Leliua, Mikaele Teofilo, Volipolo Soaemalelalui, Tommy Gale together with James Atherton (CI-PIP).

Plan compilation was undertaken by a smaller team (TS, JA, TT, TF, ST, SS, ND and Misa Konelio) with guidance from Dr David Butler who also edited the document.

Thanks are also due to the villagers throughout Samoa who allowed survey work to proceed on their land and who have participated in discussions on the conservation of this bird.

BACKGROUND

1. Introduction – species description, significance & status

1.1 Species description:

The Ma'oma'o is a large, dark honeyeater (28-31cm) with a long down-curved black beak about one and a half times the size of the more common Iao or wattled honeyeater (*Foulehaio carunculata*). It has been described as entirely 'uniformly olive black with a brown suffusion and an olive stripe beneath the eye' (Watling 2001). However recent observations of a pair in excellent light suggest that the tail is a uniform light chestnut brown and that the female is significantly larger than the male.

The bird's most remarkable feature is its range of extraordinary calls described as mechanical-sounding chips and short squeaks and its song which includes cat-like squeaky wails and cries and hoarse low notes.

1.2 Significance:

The Ma'oma'o was endemic to the Samoan archipelago i.e. found nowhere else. However it now seems to be confined to Samoa (formerly known as Western Samoa) as there have been no confirmed sightings in American Samoa since the 1920s (Craig 2002).

There are two other species in the *Gymnomyza* genus of large honeyeaters:
Crow Honeyeater (*G. aubryana*) – found only in New Caledonia where it is endangered and rats are considered the main factor.
Giant Forest Honeyeater (*G. viridis*) – found only in Fiji where it occurs on Viti Levu, Vanua Levu and Taveuni and is considered vulnerable.

Cultural significance

The Ma'oma'o does not seem to feature extensively in Samoan folklore. According to one legend, hearing the wails and screams of the bird around a village meant that misfortune or a death was about to happen. In fact Samoans were reported to often shoot this bird when they saw it near villages (Muse & Muse 1981).

Ecological significance

It is not known whether the Ma'oma'o has particular significance as a pollinator of any particular Samoan plants, though such a co-evolved relationship is possible.

1.3 Status:

The **global status** of the Ma'oma'o is currently coded by the IUCN as:
EN B1ab(ii,iii,v) (source: <http://www.redlist.org>).
This breaks down as follows:

EN = Endangered

B1ab (ii, iii,v) = Change in geographic range (**B**) – extent of occurrence less than 5000 km² (**1**) and habitat severely fragmented (**a**) and continuing decline in (**b**) area of occupancy (**ii**), area or quality of habitat (**iii**) and number of mature individuals (**v**).

This assessment of status was carried out before the 2006 survey but the results do not suggest any change is appropriate.

2. Past and present distribution – population trends

No detailed studies of the Ma'oma'o have ever been undertaken so there is little known about population changes. Early writers in Samoa appear to provide no information and the first detailed comments located were in the 1980s (Bellingham & Davis 1988).

In 2006 a more comprehensive survey targeted this species and the endangered Manumea with funding from the Government of Australia through its Regional Natural Heritage Programme, and this provides an assessment of its current distribution.

2.1 Past Distribution

It seems likely that the Ma'oma'o was once found throughout Samoa's forests from the coast to the mountain tops. It also used to be found on Tutuila, American Samoa and was collected by scientists there as recently as the 1920s. However, except for a couple of possible sightings in the 1960s and 1970s, it has not been confirmed since (Craig 2002).

Bellingham & Davis (1988) reported that the Ma'oma'o was seen and heard in the upland and foothill forests of both main islands. A good population occurred in upland Savaii and it dominated dawn and dusk choruses being particularly vocal at this site and at Mt Fito in O Le Pupu Pue National Park. They note three other published records of the bird in the 1960s and 1970s from Tiavi Falls and Pea'pea Cave.

Figure 2 shows the locations in which the Ma'oma'o was recorded over the period 1978-2000. A survey following Cyclones Ofa and Val identified that it disappeared from lowland forests in O Le Pupu Pue National Park between 1982 and 1991 (Lovegrove et al. 1992). A similar decline was expected in the uplands of the park which sustained severe damage in Cyclone Val.

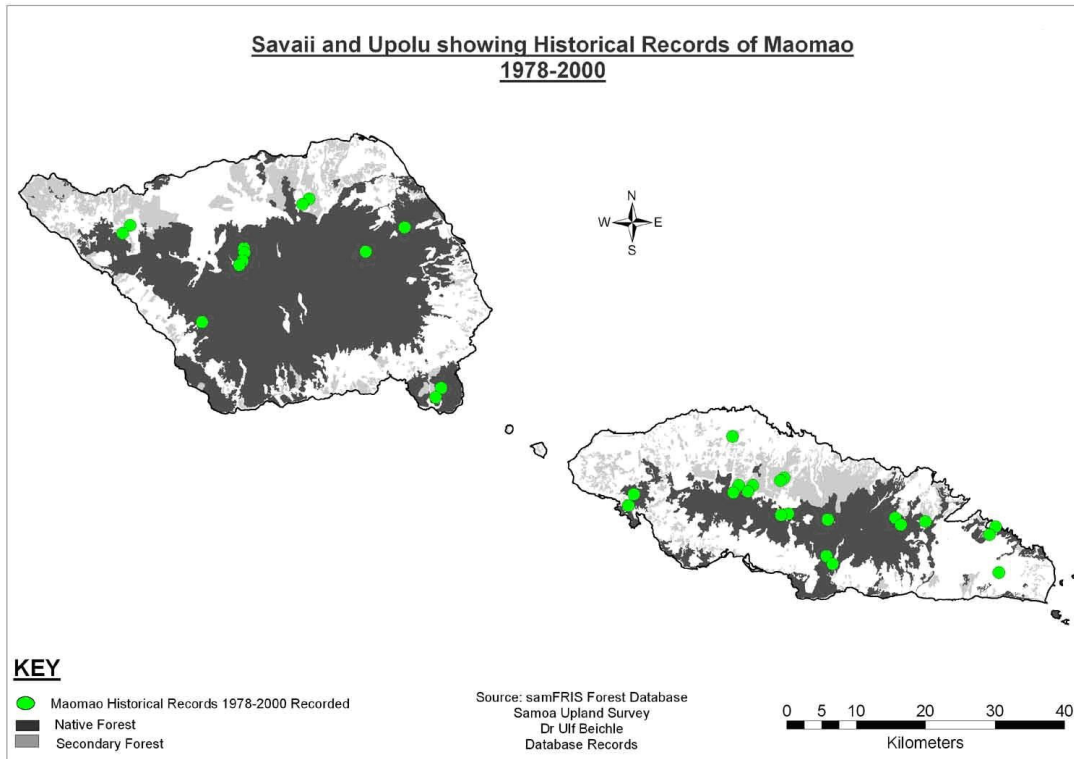


Figure 2: Historical records of Ma’oma’o, 1987-2000

During the Lowland Ecological Survey of 1991 it was only found at two of the key sites, Lake Lanotoo and Aopo Upland (Park et al. 1992) (and heard in the Vaisigano catchment), and one was also seen on the northern track into the lake in November 1996 (Tarburton 2001). The latter author also saw birds at only two other sites during his 3-year stay in Samoa, Mt Vaea (1995) and Tiapapata (1997). No birds were heard at Mt Eliotoga in 1991 where they had been recorded in 1982 (Park et al. 1992).

During the Upland Ecological Survey Ma’oma’o were recorded at three sites on Upolu (Mt Fito, Aleipata, Sauniatu) and three on Savaii (Aopo, Silisili, Salailua) (Schuster et al. 1999). During 4 days of survey of the cloud forests of upland Savaii (Mata o le Afi, Mauga Mu, Mt Silisili) only 2 were heard. At Salailua (site of 700-1200m altitude) they were present in low numbers.

2.2 Present Distribution (2001-2006)

Figure 3 shows the locations at which the Ma’oma’o was heard or seen during the recent surveys. It is worth noting that these surveys were largely timed to suit observations of the Manumea (Tooth-billed Pigeon) which was a key element of the project. Most occurred during the day instead of the early mornings and evenings when the Ma’oma’o calls most often. Thus the Ma’oma’o may have been missed at some sites. For example, villagers at Matafaa confirmed that the Ma’oma’o is still heard in their forests though not recorded in the survey.

During the later parts of the survey (March 2006 onwards) the playing of tape-recorded calls of the Ma’oma’o was used to detect birds which responded by calling back.

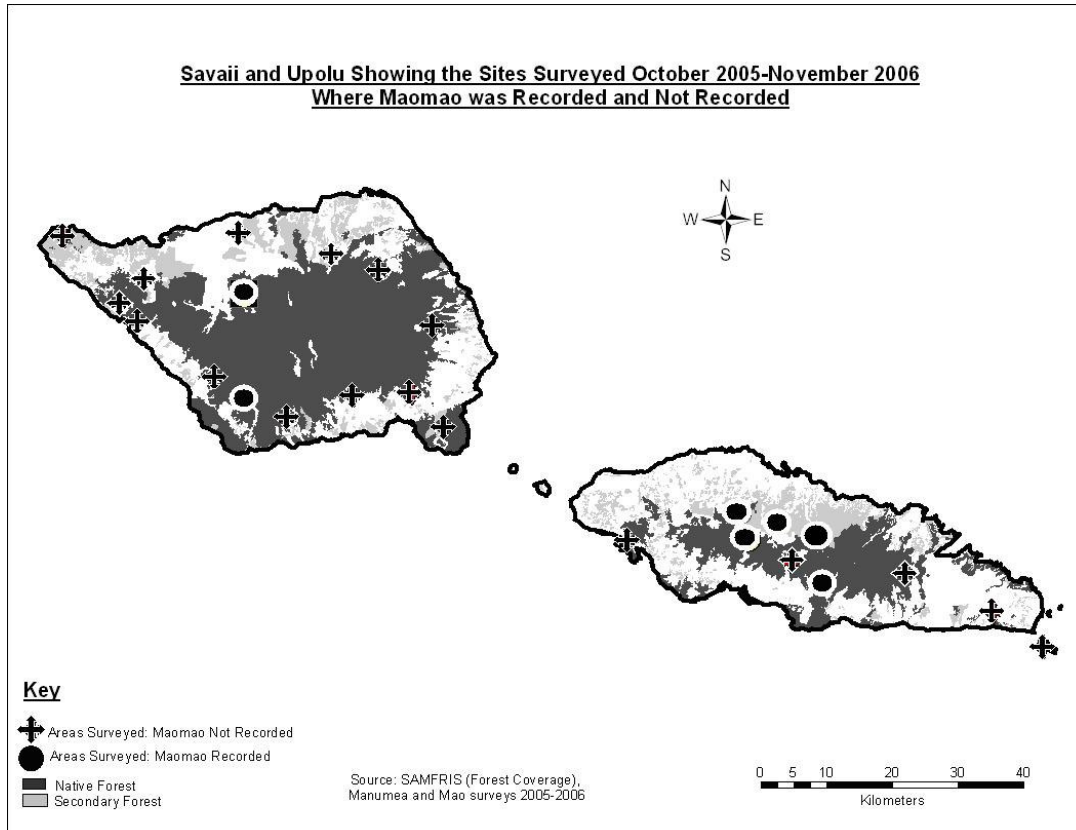


Figure 3: Sites where Ma'oma'o was recorded or not recorded during October 2005-November 2006 survey.

2.3 Population Trends

Lovegrove et al. (1992) referred to a decline evident between the early 1980s and 1990s, the period during which the two severe cyclones of Ofa and Val occurred. The most recent survey suggests that this decline has continued. Using the Uafato area as an example, a pair were found in 1992 in a small patch of intact forest 50m from beach (Lovegrove et al. 1992) and one was heard by Beichle on the mountain slopes there in September 1997 (Beichle 1997) but none were recorded during the recent survey. None have been heard on Mt Vaea in recent years.

However there are some sites where birds have been consistently present over the past ten years such as the Vaisigano Catchment, Tiapapata, and Mt Le Pue/Mt Fito area.

Overall this species seems likely to be present in smaller numbers than the Manumea with fewer in upland Savaii which is considered a stronghold for the pigeon.

The IUCN Redlist 'status history' mirrors the decline in Samoa as the bird has changed ranking from 'Lower risk/least concern' in 1988 to 'Vulnerable' in 1994 and 'Endangered' in 2000 and 2004.

3. Cause of decline & current threats

Loss of Forest Habitat

This will have been a major factor behind the decline in the Ma'oma'o which is a forest species. Figures 4, 5 and 6 show the loss of native forest cover between 1954 and 1999 and Table 1 shows the percentage of land area under forest during these surveys (Atherton 2004).

Table 1. Comparison of historical land area under forest in Samoa

Year	Upolu	Savaii	Total Samoa
c. 1954	65	79	74
c. 1987	43	63	55
c. 1999	46	69	60

Sources of data: 1954 (Fox and Cumberland 1962); 1987 (ANZDEC 1990); 1999 (Atherton 2004).

The 1954 and 1987 data can be directly compared as similar techniques were used and these show significant forest loss, particularly in the lowlands. The 1999 assessment was much more detailed using a higher mapping scale, including more forest types and more checking on the ground. So the apparent increase in forest between 1987 and 1999 is probably not real and it is more likely that forest cover continued to decline over this period.

In addition to loss of forest, the quality of the forest that remains has declined. The 1999 analysis identified 32% of the total forest cover as 'open' forest (less than 40% tree cover) and less than 0.05% as 'closed' forest, largely as a result of Cyclones Ofa and Val (Atherton op. cit.). Another 24% of the forest cover is classified as secondary re-growth forest. The Samoan forest is now extremely open and patchy which means that it can support fewer birds and is more vulnerable to invasive weeds.

Forest clearance remains an ongoing threat to the Ma'oma'o. Logging is slowing down as accessible forest has largely been removed, but it is still a problem on Savaii despite years of effort to phase it out and this being mandated in a Forests Policy developed in 1994. A deforestation policy is currently under development. Some clearance of forest for agriculture continues even on the edges of National Parks and Reserves. Shifting cultivation increasingly threatens remaining areas of upland forest which seem important refuges for the honeyeater, as farmers use forestry roads from heavily logged lowland forests to gain access to formerly inaccessible land.

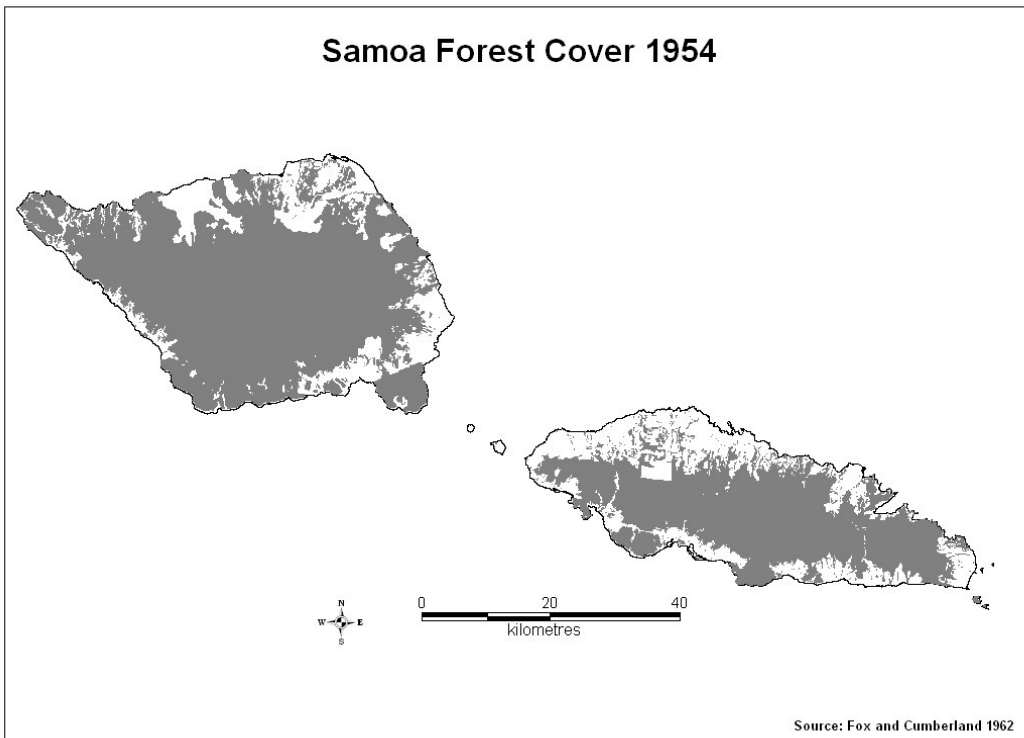


Figure 4. Samoa's Forest Cover 1954

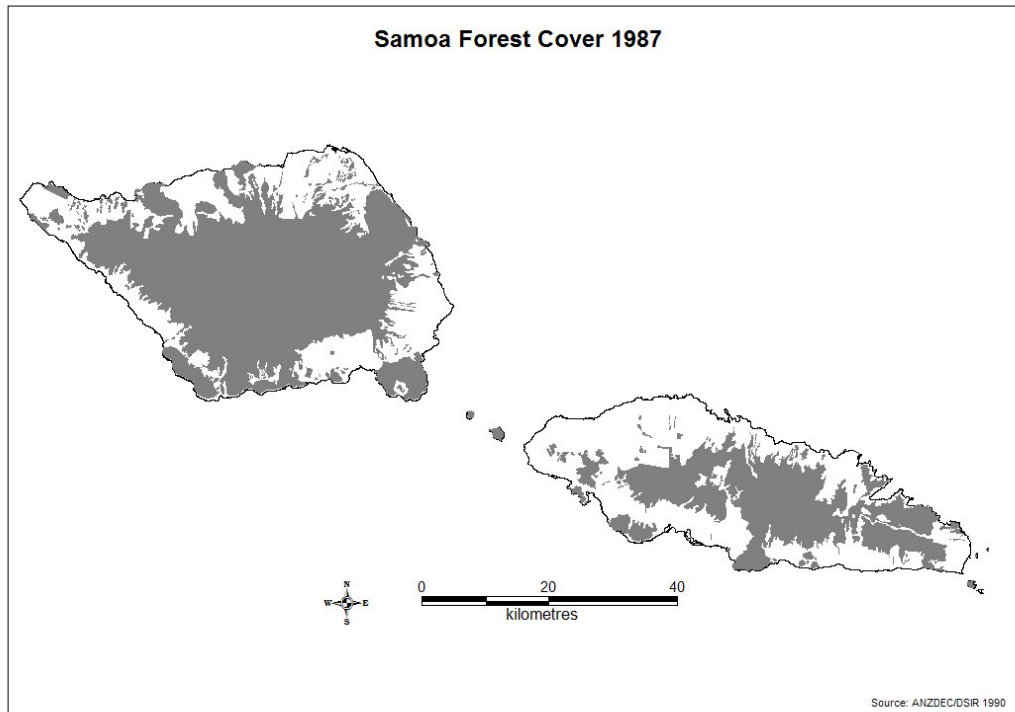


Figure 5: Samoa's Forest Cover 1987

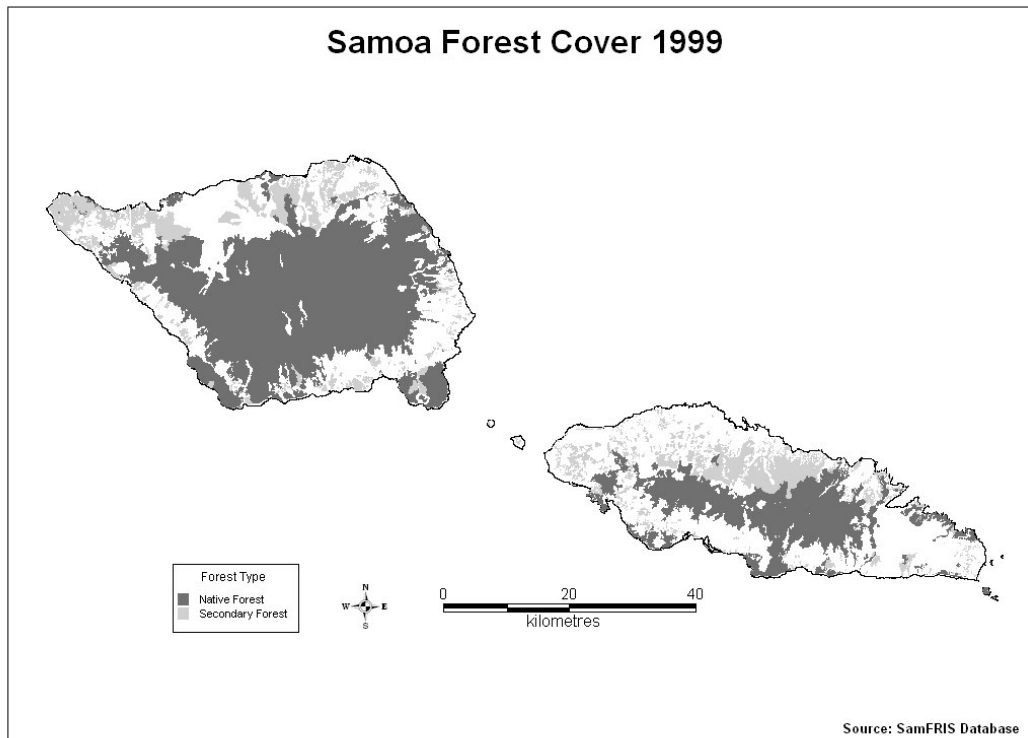


Figure 6: Samoa's Forest Cover 1999

Some efforts to replant trees have been made, particularly in water catchments, but historically the species used have been mostly exotics and certainly not contributing food for the Ma'oma'o.

The apparent extinction of the Ma'oma'o on Tutuila, American Samoa where large areas of intact forest remain, suggest other factors may also be very important.

Natural Disasters

Cyclones are clearly significant threats to the Ma'oma'o destroying its forest habitat as well as causing individual deaths. During the two most powerful cyclones in recent years, Ofa in 1990 and Val in 1991, forest canopy cover was reduced from 100% to 27% Elmquist *et al.* (1994). An assessment of the impacts of Val on wildlife reported that nectar-eating and omnivorous species declined at many sites and identified the Ma'oma'o as one of the highest priorities for management (Lovegrove *et al.* 1992). The most recent Cyclone to hit Samoa, Heta in 2004, was more localised in its impacts but will have damaged further areas of Ma'oma'o habitat.

Fire is a threat to forests in low rainfall areas of Samoa, such as the north-west coast of Savai'i, and during times of relative drought. Part of the rainforest preserve at Falealupo was further damaged by a series of fires in the 1990s after being hit by the two cyclones.

Landslips are a minor factor but do remove areas of forest cover during periods of prolonged rain.

Rats (*Rattus* spp.)

Samoa has three introduced rat species, Ship Rat (*R. rattus*), Norway Rat (*R. norvegicus*) and Pacific rat (*R. exulans*) all of which are considered to have arrived before 1924 (ISSG – Global Invasive Species Database). Detailed information on their numbers and distribution is not available. However experience overseas suggests that ship rats will be the dominant species in forests on the main islands and they pose the greatest threat to the Ma'oma'o as they are excellent climbers. Rats have been identified as the main reason that the closely-related *Gymnomyza aubryana* in New Caledonia is endangered. They could also be part of the explanation for the extinction of the Ma'oma'o in American Samoa where good quality forest remains.

Loss of Forest Quality

Where forest remains there may still be an issue of reduced quality. Much thinning has occurred during the cyclones and some areas are being invaded by weeds which may impact on the bird's food trees.

Hunting

This may be a minor threat to the Ma'oma'o though some birds apparently have been shot by people who are afraid of them due to their calls. One individual at the national workshop in Upolu identified that Ma'oma'o are eaten, or were eaten in the past, and it seems likely that birds are shot accidentally by hunters who are targeting pigeons. The Ma'oma'o has been fully protected by regulations since 1993.

Disease and Parasites

There is no evidence that these have been major factors contributing to the Ma'oma'o's decline though they are likely to have caused individual losses. Little is known about the diseases found in wild birds in Samoa though some research is currently being conducted on avian malaria. Disease and parasites tend to become more significant when birds are under stress from other factors, e.g. shortage of food. Current studies by American Samoan scientists focussed on avian malaria may throw more light on this issue.

Random events in small populations

As Ma'oma'o populations become smaller and more fragmented, there is an increased threat of local extinctions due to random events or chance. For example if there are only a few adult females left in a population there's a chance that they may all produce young of the same sex. If this happens for a few seasons the population will go extinct.

The relatively small size of the forest habitat on Tutuila, American Samoa (island area 1517ha of which 1120ha is national park), compared to Upolu or Savaii, may be an explanation for the extinction of the species there. That area of habitat would only have supported a relatively small population making it more vulnerable to a variety of threats.

Climate change

Changes of climate due to the build up of greenhouse gases is likely to increase the frequency of events like severe storms and cyclones and droughts and floods.

4. Ecology & biology

Relatively little is known about the ecology and the biology of the species, as is true of many of Samoa's birds.

Habitat and food:

The Ma'oma'o seems largely to be restricted to native forest, unlike Samoa's two other honeyeaters, the Iao and the Cardinal Myzomela (*Myzomela cardinalis*) which are common in modified habitats and gardens. The recent survey suggests that it is confined to foothill and montane forest, not the lowlands (Figure 7). It has currently been found on steep slopes along rivers and at forest edges, in areas of cinder cone, heath land scrub, and in craters at high altitude, in wet forest at 760 m (Figure 7). It seems clear that it has quite specific habitat requirements, but whether these relate to food or to the absence of disturbance from people, rats and perhaps cats is unknown.

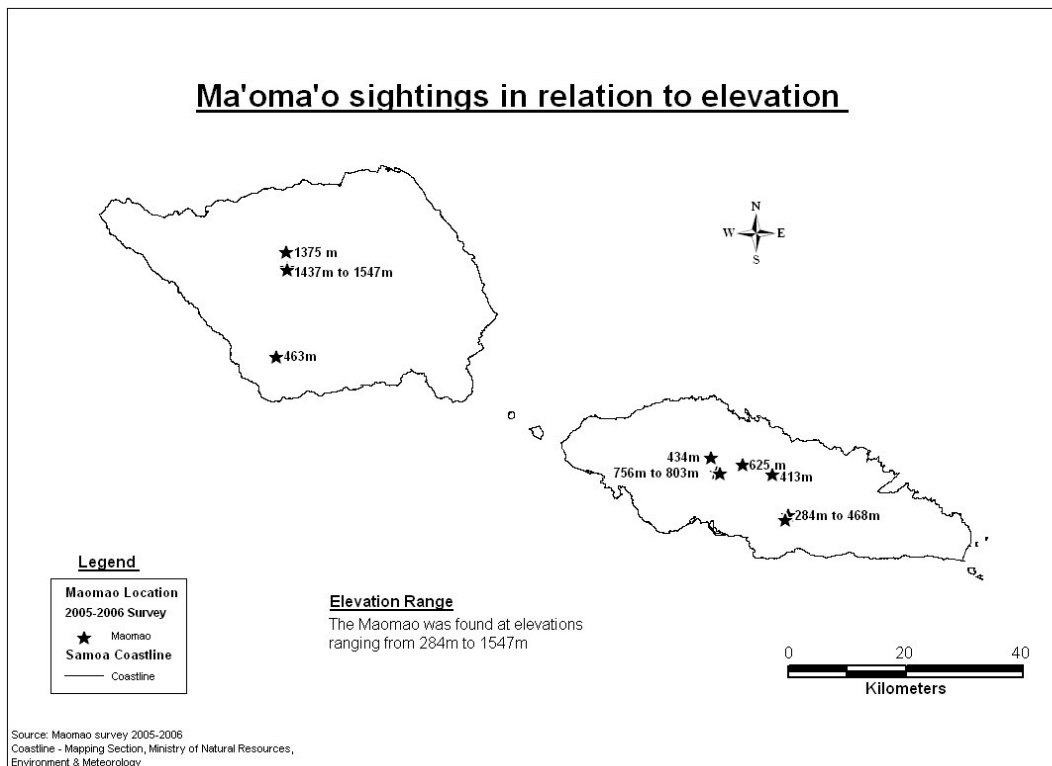


Figure 7: Locations of Ma'oma'o by elevation.



Uplands of O le Pupu Pu'e National Park where the Ma'oma'o is still found. Dave Butler photo.

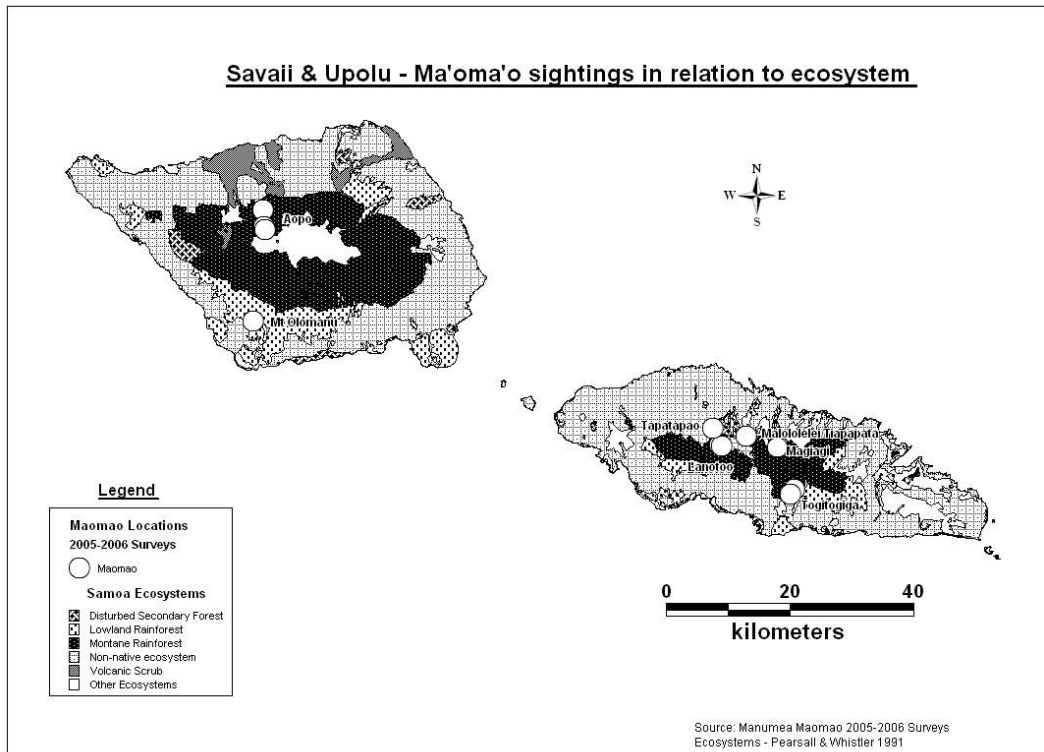


Figure 8: Ma'oma'o records by ecosystem.

The diet of the Ma'oma'o has been identified as nectar, insects and small fruit though no detailed studies have been made. Feeding has been observed in coral trees *Erythrina* spp. whose blossoms contain nectar with lots of insects (Beichle pers. obs.).

Breeding:

The only mention of breeding describes 2-3 eggs and a nest high up in the fork of a tree (Ashmole 1963)

Other behaviour:

Mao'moa are seldom seen but are quite vocal. The repertoire of calls is very variable which has been described as indicating its territoriality. Birds have been attracted by the playing of taped calls during recent surveys and their typical response seems to be to call from relatively high in the canopy and approach towards the recording but not come down close. Pairs seem to remain quite close together and some courtship with wing fluttering has been observed.

Ecology & behaviour of related species:

Detailed studies have been undertaken of the closely-related Giant Forest Honeyeater in Fiji. This species is clearly territorial and it was estimated that the average spacing between the centres of the territories of neighbouring birds was 50 to 150 metres (White et al. 2006). Its breeding season is considered to be from June to October.

5. Past conservation efforts

There have been a number of projects aiming to create community-based conservation areas on communally-owned land in recent years and several of these would have identified the Ma'oma'o as one of their target species. Rainforest Preserves have been created using overseas funds at Tafua Peninsula, Falealupo and Aopo Cloud Forest though the current effectiveness of each is uncertain. Projects within the South Pacific Biodiversity Conservation Programme and the Biodiversity Support Programme have worked with the villages of Uafato and Saanapu/Sataoa on Upolu and Aopo/Letui/Sasina on Savaii. These have generally not fully achieved their objectives but provide a basis for further work within this recovery plan.

RECOVERY GOAL & OPTIONS

6. Long-term recovery goal – for 100 years

To secure the species so it is no longer at risk of extinction; maintain its existing populations on Upolu and Savaii; and re-establish populations at former sites.

7. Options for recovery

The following list provides potential options for managing the recovery of the Ma'oma'o.

- Habitat protection – e.g. community conservation areas, community management agreements, reserves, national parks.
- Habitat restoration – e.g. re-planting, removing invasive species, linking forest patches.
- Control of predators or competitors – most species live in balance with their natural predators and competitors, but they face problems from introduced (alien) invasive species.
- Translocation – moving individuals of a species from one habitat to another, e.g. birds from the mainland where they are exposed to introduced predators to a pest-free island
- Management in captivity
- Supplementing food – providing additional food to birds in the wild
- Manipulating breeding – e.g. moving eggs from nest to nest to ensure each pair has young to rear and stimulate re-laying
- Treating to prevent or manage disease and parasites
- Education – likely to be an element of all the other options to ensure sustainability
- Raising Public Awareness – likely to be an element of all the other options to encourage public support and involvement
- Legislation/Policies/By-laws – a potential element of some of the other options, e.g. conserving forest or preventing hunting.

Four overall approaches were considered:

Option 1 – Do nothing:

This option is likely to lead to the continuing decline in the numbers and range of the species and bring it closer to extinction.

Option 2 – Focus only on conserving forest habitats:

This option would involve focussing all the effort on securing the forest areas currently occupied by the Ma'oma'o. However and there would be very limited public support for addressing this issue. It is also uncertain how productive the species is currently in the face of other threats like invasive species.

Option 3 – Conserve forest habitats and investigate ways to increase the number of birds and populations. Develop public support:

This option addresses the current threat that we know about and investigates how to establish further populations. The more secure populations the species has in different locations, the greater the chance of it surviving and recovering from localised natural disasters like cyclones.

Option 4 – As 3, but also investigate the breeding and feeding ecology of the species in detail:

It is uncertain whether the species would maintain or increase its numbers if all the measures in option 3 were put in place. We know nothing about current breeding success and mortality. The loss of the species from American Samoa suggests that other factors other than loss of habitat are involved, and rats seem a possible cause.

Preferred Option:

Option 4 has been chosen for the duration of this plan.

8. Objectives for 2006-2016

(Note: Year 1 of the 10 runs from 1 July 2006 to 30 June 2007).

- Objective 1: Conserve and manage key forest areas on Upolu and Savaii to secure Ma'oma'o populations on both islands
- Objective 2: Carry out detailed surveys to identify the numbers of pairs at certain sites and establish monitoring to record any changes in this over time.
- Objective 3: Increase the understanding of the breeding and feeding ecology of the Ma'oma'o to aid species recovery
- Objective 4: Establish populations on rat-free islands or new mainland sites
- Objective 5: Evaluate the development of a captive management programme
- Objective 6: Develop a public awareness and education programme
- Objective 7: Develop partnerships to assist in the recovery of the Ma'oma'o through provision of funds, support or expertise.
- Objective 8: Establish a Threatened Bird Recovery Group to oversee the implementation and review of this plan and those of other priority bird species.

9. Work Plan

Objective 1: Conserve key forest areas on Upolu and Savaii to secure Ma'oma'o populations on both islands.

Annex I identifies the process used to identify 6 key forest areas on both main islands whose conservation will provide sufficient habitat for the medium-term survival of the species. Together they provide a spread of locations and landforms that should ensure that there are always refuges for the species to survive natural disasters like major cyclones.

The aim will be to prevent the unsustainable removal of trees from these areas and develop agreed management regimes to address other threats. One or more of these areas are likely to be chosen as research sites to address objective 3.

The 6 key areas (numbered as on Figure 9) are as follows:

SAVAII

First priority:

- Uplands (site 5) (Land owned by many villages)

UPOLU

First priority:

- Matafaa/Falelatai (site 1) (Land owned by Matafaa and Falelatai villages) (Figure 10)
- O Le Pupu Pue (site 3) (Government Land - National Park)
- Leafe/Lanotoo/Fuluasou (site 4) (Land owned by Lotofaga and Fuluasou villages and Government-owned Lake Lanotoo National Park)
- Vaisigano River Catchment to Tiapapata (site 6)

Second priority:

- Tiavea/Uafato (site 2) (Land owned by Tiavea and Uafato villages) (This site is given lower priority as birds were not recorded in recent surveys though present in the past five years).

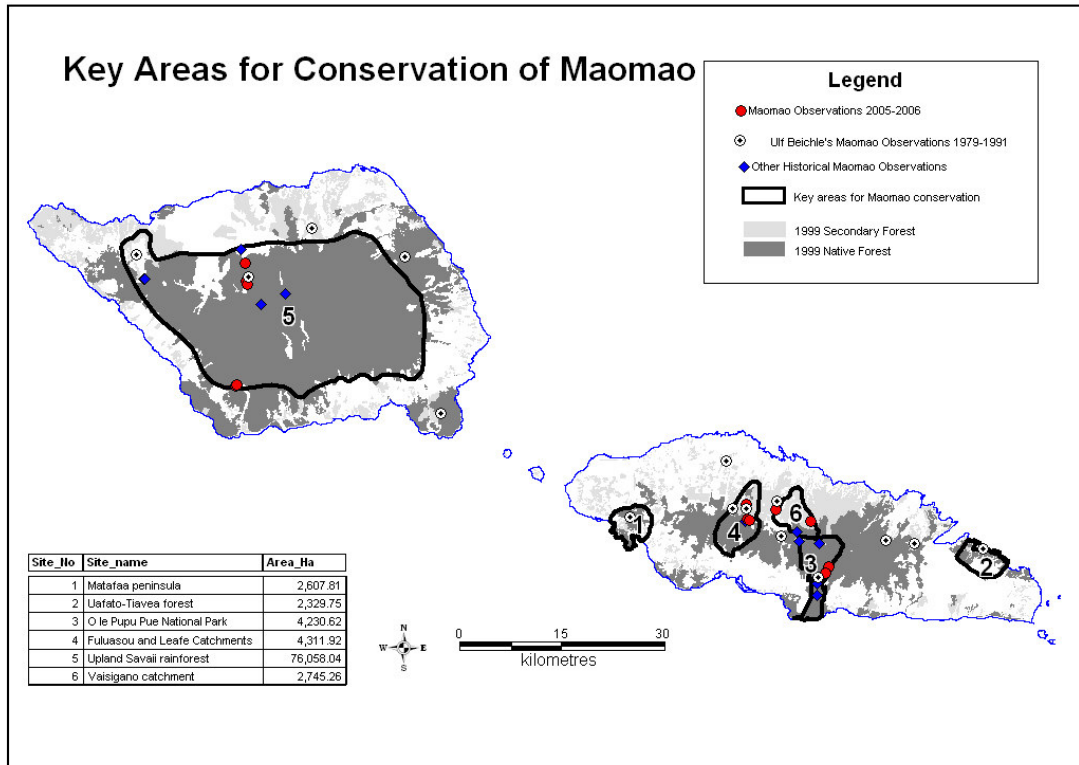


Figure 9: Key areas for Conservation of Ma'oma'o.



Fuluasou catchment (site 4) looking north.

James Atherton photo.

Action 1.1 Develop detailed site and community profiles for each key area

The site profiles will expand on the information tabled in Annex 1. The community profiles should include a wide-ranging needs analysis and seek to identify income-generation opportunities for communities, particular those using the forest of the area.

TASKS	PERFORMANCE MEASURE	RESPONSIBLE	TIMING	FUNDING
1.1.1 Compile site information for each key area	Information in Annex 2 reviewed and added to.	MNRE (DEC)	2006/07	MNRE
1.1.2 Develop a questionnaire-based survey to use to establish community profiles	Draft questionnaire produced and piloted at one site before completion.	MNRE (DEC)	2006/07	To be obtained
1.1.3 Carry out community survey in villages of all key areas	Majority of the community completed questionnaire.	MNRE (DEC)	2006/07	To be obtained

Action 1.2 Obtain community support for the conservation of each key area and define its boundaries

Follow-up workshops have been held with the following villages who have confirmed their support in principle for establishing conservation areas, or 'Important Bird Areas':

Aopo, Matafaa, Tiavea. The other named villages will be met with over the next few months. Figure 10 shows possible boundaries of the Matafaa-Falelatai site.

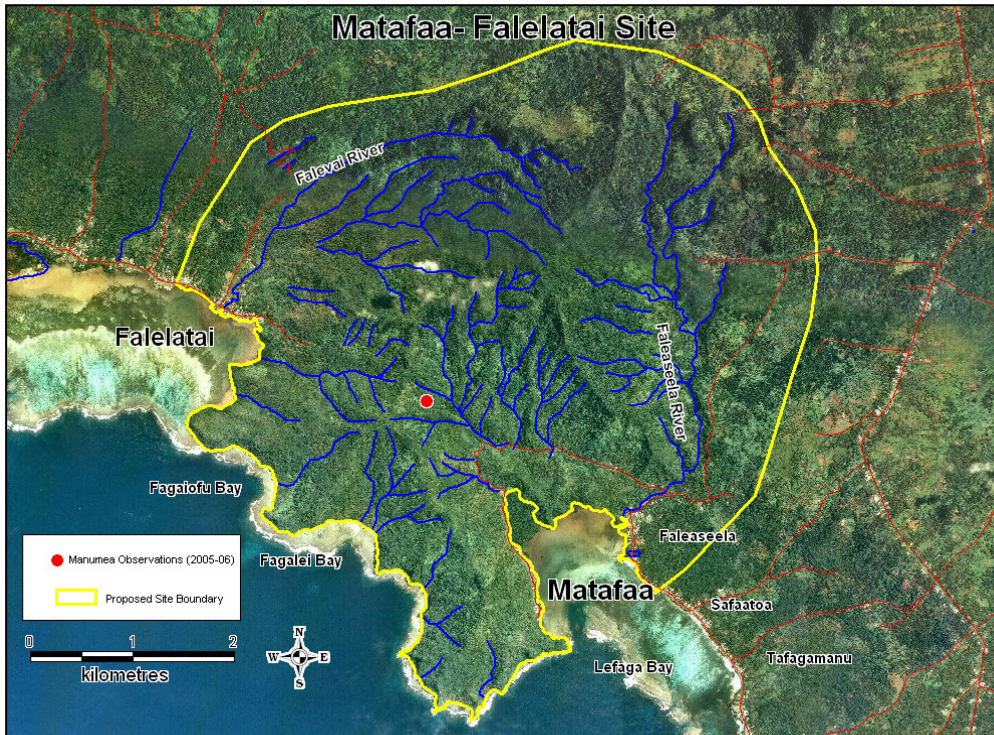


Figure 10: Matafaa-Falelatai key area.

TASKS	PERFORMANCE MEASURE	RESPONSIBLE	TIMING	FUNDING
1.2.1 Follow-up workshops – 2 Savaii (6 villages) 2 Upolu (5 villages)	Workshops held. Villages involved declare support for conservation areas on their land	MNRE (DEC ¹)	To be defined	MNRE
1.2.2 Present draft recovery plan in one workshop on each island	Plan summarised at well-attended workshops	MNRE (DEC)	September & October 2006	RNHP project

Action 1.3 Define necessary management regime within a community-based plan for each key area

A management plan for each site should include the following:

- Forest protection – measures to prevent forest clearance
- Control of invasive species – rats (and perhaps cats) may need managing depending on the results of the research under objective 3 along with weeds that threaten the forest
- Monitoring of Ma’oma’o – ideally all the sites together would form a network of long-term monitoring stations across the country, all counted at the same time of year, while some would be looked at in more detail (objective 2)

¹ Division of Environment & Conservation

- Monitoring of other ecosystem elements – e.g. perhaps counts of other birds; flying foxes; flowering and fruiting of trees
- Monitoring of community – attitudes to and use of the conservation area
- Community development – measures to address some of the community’s development needs
- Education and awareness – activities targeted locally for school children and other members of the community, and national to raise awareness of the project and (if desired) attract visitors.

The following are some of the actions that a community could commit to:

- Maintaining a riparian strip of forest alongside waterways – there is some legal requirement for this
- Keeping cattle out of waterways
- Not cutting down certain key native tree species when clearing land for plantations
- Not clearing land on steep slopes
- Developing community forestry activities (The subject of a current AUSAID project)
- Declaring the area an ‘Important Bird Area’ – terminology adopted internationally and promoted in the region by Birdlife International.

This work will need to be prioritised. The different key areas can be placed in a priority order based on issues like the urgency of addressing current threats, the amount of interest of the community, and the importance of their Ma’oma’o population. However the priority order might change to take advantage of other opportunities; e.g. the GEF medium-sized project in Savaii may provide a chance for more progress to be made with villages owning parts of the uplands there.

At the same time it will be important to maintain some contact with all villages involved in a key area, so that they maintain their interest in the project. Areas involving communal land might be priorities over areas of Government land for this reason

TASKS	PERFORMANCE MEASURE	RESPONSIBLE	TIMING	FUNDING
1.3.1 Place key areas in a priority order for action	Sites placed in agreed priority order	MNRE	Oct-Dec 2006	MNRE
1.3.2 Draft management plans with communities – discuss, finalise and endorse	Plans developed and signed off for priority areas.	MNRE & communities	2007 onwards	To be obtained
1.3.3 Investigate options within Forestry’s Community Forestry project	Meeting held. Options identified & recorded. Forestry staff become involved.	MNRE (DEC & Forestry)	October-December 2006	MNRE
1.3.4 Develop proposals to secure funding	Proposals successful in obtaining funds	MNRE (DEC)	e.g. CEPF ² early 2007	MNRE

² Critical Ecosystem Partnership Fund

Objective 2: Carry out detailed surveys to identify the numbers of pairs at certain sites and establish monitoring to record any changes in these over time.

Ma'oma'o have been resident at certain sites in central Upolu for the past 10 years or more, such as the Vaisigano River catchment and adjacent Tiapapata. The former provides an excellent linear transect that can be regularly surveyed. The aim of this would be to identify the number of pairs in a certain length of transect and monitor these from year to year. It will be interesting to compare the results with the territory sizes identified for the Fijian Giant Forest Honeyeater (White et al. 2006).

Action 2.1 Finalise a survey technique and identify sites

Three priority sites have been identified on Upolu which are readily accessible from MNRE offices: Vaisigano River/Magiagi, Fuluasou River catchment and O Le Pupu Pue National Park. Transects need to be defined in each of these.

TASKS	PERFORMANCE MEASURE	RESPONSIBLE	TIMING	FUNDING
2.1.1 Finalise a survey protocol	Protocol developed and field tested.	MNRE (DEC) & Advisers	Oct-Dec 2006	MNRE
2.1.2 Identify transects to monitor in 2 or 3 priority sites.	Extent of Magiagi transect agreed. 2 nd transect confirmed.	MNRE (DEC) & Research Partners	Oct-Dec 2006	MNRE

Action 2.2. Carry out annual surveys at defined sites.

TASKS	PERFORMANCE MEASURE	RESPONSIBLE	TIMING	FUNDING
2.2.1 Carry out annual recording on these transects.	Surveys conducted and data stored and analysed	MNRE (DEC) & Research Partners	2006-2016	MNRE
2.2.2 Report results annually to the Recovery Group	Report provided to group.	MNRE (DEC)	2007-2016	MNRE

Objective 3: Increase the understanding of the breeding and feeding ecology of the Ma'oma'o to aid species recovery.

A recovery programme for the Ma'oma'o depends on increasing productivity or reducing mortality, or ideally both at the same time. We have identified major causes of mortality such as loss of habitat that we can aim to reduce, but there may be others that require managing. We know very little about its productivity (e.g. how many young does the average pair raise in a season?).

Research is proposed to find out more about the Ma'oma'o and its relationship to its forest environment. Clearly its current distribution seems centred around mid-slope and upland forests but this may not be the bird's ideal habitat, just its current refuge where some of the threats to it are reduced. Some key questions to be answered are:

- When does it breed? Where does it nest? How many eggs does it lay?

- What is the success rate of nests?
- What are the causes of nest losses?
- How large an area of habitat does a breeding pair require? How do they use this habitat? Do they move significantly between seasons?
- Do they actively defend a territory or food sources?
- What are the most important foods at different times of year?
- How long does a Ma'oma'o live on average? What are the main causes of mortality?

It is planned to involve overseas scientists in the design and implementation of this work. It seems likely that rats are a threat and the work could be set up as 'research by management', i.e. rats are controlled in one area and not in another and the results are compared. This allows us to confirm if rats are a significant problem for the Ma'oma'o, and if they are it has already helped the recovery of one population by reducing their impact.

Atherton has developed a brief questionnaire to be given to those who living in areas where the ma'oma'o is found (Annex 3). It will provide

Action 3.1 Finalise a project proposal and obtain funding

TASKS	PERFORMANCE MEASURE	RESPONSIBLE	TIMING	FUNDING
3.1.1 Discuss and design a research programme with potential partners	Programme agreed on.	MNRE (DEC) Recovery Group	Oct-Dec 2006	MNRE
3.1.2 Complete a funding proposal	Proposal(s) submitted to potential donors.	MNRE & Partners	Oct-Dec 2006	MNRE

The following are some of the issues that need to be considered in the development of a research proposal:

- Selecting sites – more than one study site may be desirable to allow comparison and potentially carry out management on one. Sites need to be readily accessible and, if on communal land, have a supportive community who will ideally participate in the research.
- Identify priority questions (nesting success, home range, feeding, mortality)
- Identify a means of delivering the research – the team in Samoa will have much of the equipment needed, purchased through the RNHP project, but will need overseas experts to lead the fieldwork and provide training. Such experts could be sourced from national conservation agencies, universities or private organisations.

Action 3.2 Carry out the research programme

TASKS	PERFORMANCE MEASURE	RESPONSIBLE	TIMING	FUNDING
3.2.1 Complete a research work plan	Researchers & MNRE team agree on plan.	MNRE (DEC) & Research Partners	2007	To be obtained
3.2.2 Undertake research with annual reviews of progress	Research completed	MNRE (DEC) & Research Partners	2007-2012	To be obtained

	according to work plan.			
3.2.3 Feed the results of the research into education and public awareness programmes, and into Ma'oma'o recovery work.	Specific awareness products produced. Results used by Recovery Group in planning.	MNRE Research Partners Recovery Group	2007-2012	To be obtained

Objective 4: Establish populations on rat-free islands or new mainland sites.

Actions within Objective 3 should identify the role that introduced pests, particularly rats, play in the dynamics of Ma'oma'o populations. A current programme to restore Nuutele Island (108ha) off the eastern coast of Upolu includes the removal of the only pest mammals present, Pacific rats and pigs. This could provide a site for a further secure population of Ma'oma'o if the habitat is suitable. Re-introductions to other sites could also be considered.

The New Zealand Department of Conservation has developed a comprehensive set of translocation guidelines which identify all the issues that need to be considered in any transfer proposal.

Action 4.1 Evaluate offshore islands as opportunities to establish further populations of Ma'oma'o

Once we have a greater understanding of the habitat requirements and the threats to the Ma'oma'o, it would be possible to evaluate offshore islands as suitable sites for new populations. Nuutele will be the obvious candidate to assess, once Pacific rats have been eradicated. Both Manono (288ha) and Apolima Islands (101ha) are large enough to potential support populations but probably do not have enough native forest habitat and too many mammal pests.

TASKS	PERFORMANCE MEASURE	RESPONSIBLE	TIMING	FUNDING
4.1.1 Evaluate potential sites the option of transferring birds (using international guidelines) if needed.	Transfer proposal developed and approved	MNRE Recovery Group	2011-2012	To be obtained
4.1.2 Carry out a transfer(s) if needed	Transfer(s) carried out and self-sustaining population established	MNRE Technical experts	2012-2016	To be obtained

Action 4.2 Investigate the desirability and feasibility of re-introducing Ma'oma'o to American Samoa.

The re-introduction of Ma'oma'o to American Samoa, possibly Tutuila where it was once recorded, could be considered. It would restore an element of that country's fauna and increase the security of the species as a whole by providing a wider spread of sites

as potential refuges from catastrophic cyclones. Clearly there are political issues involved as well as biological ones. It is suggested that the first step would be a dialogue between the national conservation agencies to determine if such a re-introduction was desirable and feasible. If it was supported then approaches could be made to the leaders of the two countries.

The feasibility question cannot truly be answered until the results of the research within Objective 3 are available. These should indicate whether the bird would be likely to thrive on Tutuila (or one of American Samoa's other islands) under existing conditions or whether some other actions are required, e.g. rat control.

TASKS	PERFORMANCE MEASURE	RESPONSIBLE	TIMING	FUNDING
4.2.1 Discuss the desirability and feasibility of introducing Ma'oma'o to American Samoa.	Discussions carried out and outcome recorded	MNRE DMWR ³ Recovery Group	2006-2010	MNRE
4.2.2 Obtain political support for a transfer if recommended	Approval of both Government's obtained	MNRE DMWR	2010-2011	MNRE
4.2.3 Carry out a transfer(s) if needed	Transfer(s) carried out and self-sustaining population established	MNRE DMWR Technical experts	2012-2016	To be obtained

Action 4.3. Evaluate opportunities to re-introduce Ma'oma'o to former sites on Upolu and Savaii .

Similarly, once we know more about the Ma'oma'o, we may be able to consider re-introductions to forest areas on the main islands from which it has been lost. For example, if we know more about the trees that Ma'oma'o depends on we may be able to plant these. If we find that rats are a major problem we may be able to control these over quite large areas, as done successfully in Rarotonga to bring about the recovery of kakerori (*Pomarea dimidiata*) there (Robertson & Saul 2004).

One site that has a lot of appeal for a re-introduction is the Mt Vaea Scenic Reserve. This is Government land close to Apia and visited by many people who walk its trails. It might be possible to carry out a re-introduction using birds raised at a captive breeding facility that is under discussion for that area (objective 5).

TASKS	PERFORMANCE MEASURE	RESPONSIBLE	TIMING	FUNDING
4.3.1 Evaluate the opportunities to re-introduce Ma'oma'o to sites on Upolu and Savaii	Sites evaluated.	MNRE Recovery Group	2010 onwards	To be obtained
4.3.2 Develop transfer proposals if approved	Proposals developed according to international format.	MNRE Recovery Group	2010 onwards	To be obtained

³ Department of Marine & Wildlife Resources, American Samoa

Action 4.4. Organise transfers of Ma’oma’o to new sites when their suitability is confirmed.

TASKS	PERFORMANCE MEASURE	RESPONSIBLE	TIMING	FUNDING
4.4.1 Carry out transfers and monitor their success	Transfers carried out and monitoring used to determine success.	MNRE & Partners	2011 onwards	To be obtained
4.4.2 Carry out follow-up transfers if required.	Need for further transfers evaluated. Such transfers carried out if appropriate	MNRE & Partners	2011 onwards	To be obtained

Objective 5: Evaluate the development of a captive management programme.

Discussions are currently being held regarding the development of a Conservation (captive) Breeding Centre (CBC) for Samoa potentially to be located at Vailima. This could contribute to the recovery of the Ma’oma’o in several ways:

- Providing birds that people can see as part of education and public awareness programmes
- Allowing the development of husbandry and captive rearing techniques
- Allowing the development of breeding programmes to provide birds to establish new populations.

Birds like honeyeaters with high energy requirements are not easy birds to keep in captivity. However husbandry techniques have been developed for other honeyeaters such as the helmeted honeyeater (*Lichenostomus melanops cassidix*) (Menkhorst et al. 1999) and the stitchbird (*Notiomystis cincta*) (DOC 2005). Their captive husbandry manuals would be useful resources for any Ma’oma’o programme. It is uncertain whether Ma’oma’o would be suitable birds for public display as part of education and awareness raising programmes as they may not react well to disturbance.

Action 5.1 Assess the possibility of developing a programme for Ma’oma’o.

TASKS	PERFORMANCE MEASURE	RESPONSIBLE	TIMING	FUNDING
5.1.1 Develop a scoping paper & participate in discussions re: a CBC.	Paper written.	MNRE (DEC) Recovery Group	Sept-Dec 2006	MNRE
5.1.2 Assist in drafting funding proposal for a CBC (e.g. CI – private US donors)	Advice provided to CI.	MNRE Recovery Group	Sept-Dec 2006	MNRE
5.1.3 Prepare an assessment of the potential for captive management of the Ma’oma’o	Assessment drafted, circulated and finalised.	MNRE Recovery Group	Sept-Dec 2006	MNRE

Action 5.2 Establish Ma’oma’o conservation breeding programme if considered worthwhile

TASKS	PERFORMANCE MEASURE	RESPONSIBLE	TIMING	FUNDING
5.2.1 Develop a captive management plan prior to bringing birds into captivity	Captive management plan using international format approved.	MNRE (DEC)	2007 onwards	To be obtained
5.2.3 Establish a captive population by collection birds or eggs from the wild	Self-sustaining population established in captivity.	MNRE (DEC)	2007 onwards	To be obtained

Objective 6: Develop a public awareness and education programme.

The detailed actions required under this objective are yet to be defined by DEC. However, the following elements have been identified as important components of a national environmental awareness and education campaign. Such a campaign could be developed in conjunction with that for the Manumea and for native birds in general:

- National workshops on strategy (Sept)
- Media work (Aug-Sept) (MTV, radio/TV/paper)
- Newsletters (Capacity Building section)
- Environment Week (Nov)
- Environment Forum
- Biodiversity Day
- Roadshow targeting youths and adults

National campaign 2007 – documentary – video on plane – cartoon

- Develop campaign - brainstorming
- Develop funding proposal
- Implement
 - Campaign coordination
 - Roadshow

The 1993/1994 project with the RARE Center concluded with the following recommendations:

- Continue the puppet show in schools and on television, developing it further to include shows on the conservation of other key species. Use the Ma’oma’o as a symbol and a spearhead of these further developments
- Mobilise a group of artists to develop a roadshow using a variety of media including displays, drama, musical numbers and concerts addressing key environment and conservation concerns
- Develop TV and radio ‘spots’ to promote environmentally friendly practices using the Ma’oma’o.
- Extend Environmental Education Workshops into rural villages in the form of short training courses.

The following activities have been identified:

- School visits (Complete)
- School quiz on radio (August)
- Visit all schools in country (obtain funding)
- Ma'oma'o learning kit for schools

The Ma'oma'o has featured on a postage stamp - an example of national awareness raising.



Objective 7: Develop partnerships to assist in the recovery of the Ma'oma'o through provision of funds, support or expertise.

The recovery programme outlined in the earlier objectives requires significant expertise and funding, beyond that which is currently available in agencies within Samoa. Thus partnerships need to be built with other organisations outside the country.

The following is a non-exhaustive list of possible partners:

- Global Environment Facility (GEF) – there may be opportunity for Small Grants for village Communities to develop conservation areas for the Ma'oma'o. Also a GEF/UNDP Medium-sized Project is close to being approved for forest conservation on Savaii which could play a major role in conserving populations on that island
- Critical Ecosystem Partnership Fund – the Ma'oma'o has been identified as a priority species within the Micronesia/Polynesia Hotspot and thus actions to conserve it will be eligible for funding when the CEPF is launched (early 2007 probably)
- Birdlife International – a leading bird conservation agency that works with in-country partners. The NGO O Le Siosiomaga Society is its partner in Samoa.
- Division of Marine & Wildlife Resources, American Samoa (DMWR) – DMWR scientists conduct research on the ecology of the same forest habitats

found in Samoa though the Ma'oma'o appears to be no longer found in American Samoa.

- SPREP Avifauna Programme – An Islands Biodiversity Officer has been appointed to take responsibility for this programme which lists the Ma'oma'o as a priority species.
- SPREP Education and Awareness Programmes.
- Conservation International (CI) – CI is in the early stages of discussion on the setting up of a Samoa programme
- RARE Center for Tropical Conservation – RARE funded an earlier 1-year conservation education programme on the Manumea
- Living Archipelagos – a programme being developed by the Bishop Museum, Hawaii which aims to identify and help protect a select group of priority sites of high ecological value.
- Pacific-Asia Biodiversity Transect (PABITRA) - a collaborative program for investigating the function of biodiversity and the health of ecosystems in the tropical Pacific Islands using mountain to sea transects.
- Global Conservation Fund – a CI fund that finances the creation, expansion and long-term management of protected areas in the world's biodiversity hotspots.
- National Conservation Agencies, Universities and Zoos – such organisations are likely to be involved in research and captive breeding programmes.
- Fiji Conservation Agencies – it may be that information to assist Ma'oma'o recovery can be gained from knowledge of the closely related Giant Forest Honeyeater (*Gymnomyza viridis*) in Fiji.

Action 7.1 Establish contact with potential partners for different plan objectives as appropriate.

TASKS	PERFORMANCE MEASURE	RESPONSIBLE	TIMING	FUNDING
7.1.1 Meeting with project partners to define roles	Meeting held and roles agreed.	MNRE (DEC)	Oct-Dec 2006	MNRE

Objective 8: Establish a Threatened Bird Recovery Group to oversee the implementation and review of this plan and those of other priority bird species.

Species Recovery Plans are typically developed and supported by a Recovery Group which brings together those directly involved in the conservation of the species, other stakeholders and outside experts. It has been suggested that Samoa does not have the resources to develop groups for each individual threatened species. Thus a Threatened Bird Recovery Group is proposed. The initial focus of this group will be on the Ma'oma'o, the Manumea for which a plan is being produced in parallel with this one with RNHP funding, and the Tuameo or Friendly Ground Dove (*Gallicolumba stairi*) which is the subject of current surveys and DNA analyses.

Recovery Groups are advisory and do not control any funds or assign individuals to tasks. The person/position in Samoa to be advised by the Group needs to be identified, probably either the CEO or the Assistant Director (Environment) of MNRE.

Action 8.1 Identify the members of the Recovery Group and its reporting process.

TASKS	PERFORMANCE MEASURE	RESPONSIBLE	TIMING	FUNDING
8.1.1 Identify the members of the recovery group and define its modus operandi	Membership and methodology agreed.	MNRE (DEC)	Oct-Dec 2006	MNRE
8.1.2. Form recovery group	Group formed and resourced.	MNRE (DEC)	Oct-Dec 2006	To be obtained.

10. Research Priorities

A few other research priorities are listed here in addition to studies of the bird's ecology and behaviour under Objective 5.

- The extent of avian malaria and other wildlife diseases in Samoa. (The Department of Marine & Wildlife Resources, American Samoa, have done some preliminary surveys for avian malaria).
- Methods for developing community-owned conservation areas (including forest valuation).

11. Review Date

The Threatened Bird Recovery Group aims to meet annually to review progress of the plan and advise on the programme for the next year. A brief review of the Plan is proposed after 5 years (2011) to check whether it is on track or whether new information requires some changes in objectives. A full review will take place in 2016 leading to the development of a new plan for a further period.

REFERENCES

- ANZDEC. 1990. *Land Resource Planning study: Western Samoa*. Final Report. ADB TA No. 1065-SAM. Lower Hutt: DSIR Division of Land and Soil Sciences.
- Ashmole, M.J. 1963. Guide to the Birds of Samoa. Pacific Scientific Information Center, B.P. Bishop Museum, Honolulu, Hawaii. 21pp.
- Atherton, J. 2004. Comparison of 1999 forest cover with previous forest cover maps. Extract from GIS Design and Development 3rd Mission Final Report for FAO. December, 2004, Apia, Samoa.
- Beichle, U. 1997. Report on a proposed Conservation Area at Uafato, Upolu, Samoa. Unpubl. report to SPREP SPBCP. Stasstliches Museum fur Naturkunde und Vorgeschichte, Oldenburg, Germany.
- Bellingham, M. and Davis, A. (1988) Forest bird communities in Western Samoa. *Notornis* 35: 117-128.
- Craig, P. (Ed.) 2002. Natural History Guide of American Samoa – A Collection of Articles. National Park of American Samoa, Pago Pago.
- Department of Conservation 2005: Hihi/stitchbird (*Notiomystis cincta*) recovery plan. Threatened Species Recovery Plan 54. Wellington, 31 p.
- Fox, J.W. and Cumberland, K.B. (eds). 1962. *Western Samoa: Land, Life and Agriculture in Tropical Polynesia*. Christchurch: Whitcombe and Tombs.
- Lovegrove, T., Bell, B. & Hay, R. 1992. The indigenous wildlife of Western Samoa – Impacts of Cyclone Val and a recovery and management strategy. Unpubl. report to NZ Ministry of External Relations & Trade. NZ Department of Conservation, Wellington, New Zealand. c50pp.
- Menkhorst, P., Smales, I. & Quin, B. 1999. Helmeted Honeyeater Recovery Plan 1999-2003. Department of Environment & Heritage, Parks ACT 2600, Australia.
- Muse, C. & Muse, S. 1982. Birds and Birdlore of Samoa. O Manu Ma Ta'alaga o Manu o Samoa. Pioneer Walla Walla, Washington. 156pp.
- Pearsall, S.H. & Whistler, W.A. 1991. Terrestrial ecosystem mapping for Western Samoa. Report to Government of Samoa by South Pacific Regional Environment Programme and East-west Center, Environment & Policy Institute, Honolulu, US. 72pp.
- Robertson, H.A. & Saul, E.K. 2004. Conservation of kakerori (*Pomarea dimidiata*) on the Cook Islands in 2002/03. DOC Science Internal Series 167. Department of Conservation, Wellington, New Zealand.

Schuster, C., Whistler, A, Tuaillemafua, T.S. & Butler, D.J. 1999. The conservation of biological diversity in upland ecosystems of Samoa. Department of Lands, Surveys & Environment, Apia, Samoa. 164pp.

Tarburton, M. 2001. Observations on the status of the land birds, wading birds and seabirds of Samoa. *Emu* 101: 349-360.

White, N.A., Osbourne, T., Thomas, N., Morley, C., Farley, L., Masibalavu, V. & Olson, D. 2006. (In prep. ?) An estimate of the Minimum Forest Area to Sustain a Population of the Fijian Giant Forest Honeyeater (*Gymnomyza viridis*).

ANNEX 1: SELECTING KEY AREAS FOR THE CONSERVATION OF THE MA’OMA’O

The following criteria were used in selecting the key areas:

- Sites must include all areas where the Ma’oma’o was recorded in recent surveys 2005-2006
- Sites should include as many of the sites recorded for the Ma’oma’o from historical surveys as possible (pre 2005)
- Sites should include complete forest blocks from the latest Samoa forest cover map (1999) (Figure 6)
- Wherever possible sites should follow watershed boundaries to the lower edge of the forest
- As far as possible the site should include within its boundary existing Conservation Area (CA) or Protected Area boundaries
- Sites should follow boundaries of proposed CAs (such as those from lowland ecological survey, upland ecological survey and Pearsall and Whistler (1991) survey)

The following table summarises information on the six key sites chosen using these criteria.

Sites for Ma’oma’o Conservation

Site	Upland Savaii Rainforest	O Le Pupu Pue National Park	Upper Fuluasou & upper Leafe Catchments (includes L. Lanoto’o National Park)	Tiavea - Uafato forest	Matafaa - Peninsula	Vaisigano Catchment
Location	Central Savaii	South coast to central Upolu	Central Upolu	North coast Upolu	South-west Upolu	North Central Upolu
Villages that have land tenure over site	Aopo, Letui, Manase, Patamea, Vaipouli, Puapua, Vaiaata,	Saaga and Saleilua	Lotofaga, Afiamalu, Tapatapao, Tanumapua	Tiavea and Uafato	Matafaa, Faleaseela, Falelatai	Magiagi, Vailima, Avele, Letava, Vaoala, Vailima, Tiapapata

Site	Upland Savaii Rainforest	O Le Pupu Pue National Park	Upper Fuluasou & upper Leafe Catchments (includes L. Lanoto'o National Park)	Tiavea - Uafato forest	Matafaa - Peninsula	Vaisigano Catchment
	Vaiola, Maota, Palauli, Sili, Taga, Salailua, Fogasavaii, Fagafau, Vaisala, Asau					
Approx village population (2001 census)	38,000	1089	1509	936	1837	5156
Area of Site (ha)	76,000	4230	4312	2330	2608	2745
Size of Forest Habitat (ha)	69042	2857 (due to be extended)	3658 (L.Lanoto'o N.P. is 200ha of this)	1077	1696	2357
Land Ownership	State & Customary	State	State & Customary (small area of freehold)	Customary	Customary	State & Customary
Altitudinal Range (m)	160-1800m	0-1158m	160-750	0-740m	0-450m	100-1120
Community Support	Most villages to be followed up.	To be determined	To be determined	Yes – Tiavea followed-up	Yes – Matafaa followed-up on	To be determined.

Site	Upland Savaii Rainforest	O Le Pupu Pue National Park	Upper Fuluasou & upper Leafe Catchments (includes L. Lanoto'o National Park)	Tiavea - Uafato forest	Matafaa - Peninsula	Vaisigano Catchment
					28/7/06	
Forest Condition and Quality	Generally good quality	Low quality, severely damaged by cyclone winds	Medium (low in exposed places, high in sheltered valleys and gullies)	Generally good quality	Medium quality, damaged by cyclone winds	Low quality, much secondary forest
Native Ecosystems Present	Lowland, montane and cloud forest	Littoral scrub, lowland and montane rainforest	Secondary forest and montane rainforest	Ridge rainforest	Disturbed ridge rainforest and secondary forest	Disturbed montane and lowland rainforest, secondary forest
Other Conservation Efforts	Part protected as Aopo Cloud Forest Preserve. 1-year conservation project (USAID for Aopo, Letui & Sasina. GEF Medium-sized grant project close to	National Park since 1978. Various facility development projects.	L. Lanotoo National Park formed in 2003 & RAMSAR site	SPBCP Conservation Area project at Uafato since 1993 (OLSSI)	Mangrove conservation project – GEF Small Grant.	Focus of the FAO supported Vaisigano Watershed Management Project (early 1990s)

Site	Upland Savaii Rainforest	O Le Pupu Pue National Park	Upper Fuluasou & upper Leafe Catchments (includes L. Lanoto'o National Park)	Tiavea - Uafato forest	Matafaa - Peninsula	Vaisigano Catchment
	finalisation					
Density of Invasive Species present	Low	High (espec <i>Merremia</i> in south)	High (espec tamaligi spp- <i>Albizzia</i>)	Low	High	High (espec tamaligi spp- <i>Albizzia</i>)
Other Threats	Logging		Agriculture		Agriculture	Agriculture
Other Redlisted Threatened Species	Niu vao, ma'oma'o, pea vao, <i>Drymophloeus samoensis</i>	Niu vao, ma'oma'o, pea vao	Niu vao, ma'oma'o, pea vao	Niu vao, pea vao	Niu vao, ma'oma'o, pea vao	Niu vao, pea vao
Accessibility	Low. Accessible by road from Aopo and by walking track from most villages	Medium. Not accessible except by walking track	Medium. Accessible by road from Afiamalu and Lotofaga and walking track from Tapatapao	Low. Not accessible except by walking track from both villages	Medium. Accessible by road from the new Falelatai-Matafaa road	Medium. - Accessible by road from Avele and Magiagi
Other Comments						This area is contiguous with the O Le Pupu Pue National Park

ANNEX 2: NATIONAL WORKSHOPS – SUMMARIES

INTRODUCTION

1. Two workshops were held in Upolu and Savaii with representatives of selected ministries, non-governmental organisations, and village communities on the recovery plans of the manumea and ma'oma'o. Table 1 below lists the stakeholders invited to the workshops and their potential relevant stakes to the recovery plans for the manumea and ma'oma'o.
2. The workshop participants were requested to provide their perspectives, ideas and comments in relation to their respective organisations mandates on key issues of the manumea and ma'oma'o recovery plans. The key issues or questions are in the workshop information paper in Appendix 1 of this report.

NAME OF ORGANISATION	TYPE	RELEVANT ROLES IN THE RECOVER PLANS FOR THE MANUMEA & MA'OMA'O
1. Ministry of Natural Resources & Environment	Governmental	Monitor and regulate the conservation and protection the manumea and ma'oma'o and their forest habitats
2. Ministry of Agriculture & Fisheries	Governmental	Monitor and regulate agricultural developments to ensure it enhances the conservation of the manumea and ma'oma'o
3. Ministry of Education, Sports & Culture	Governmental	Incorporate knowledge and skills related to the conservation of the manumea and ma'oma'o in the school curriculum and teacher training
4. Ministry of Women, Community & Social Development	Governmental	Incorporate national measures for the conservation and protection of the manumea and ma'oma'o into programs for the strengthening of village governing structures & processes
5. Ministry of Works, Transport & Infrastructures	Governmental	Incorporate national measures for the conservation and protection of the manumea and ma'oma'o into public infrastructure development projects
6. Ministry of Health	Governmental	Incorporate national measures for the conservation and protection of the manumea and ma'oma'o into relevant public health programs
7. Electric Power Corporation	Governmental	Incorporate national measures for the conservation and protection of the manumea and ma'oma'o into power supply infrastructure development projects
8. Samoa Water Authority	Governmental	Incorporate national measures for the conservation and protection of the manumea and ma'oma'o into water supply infrastructure development projects
9. Samoa Tourism Authority	Governmental	Incorporate national measures for the conservation and protection of the manumea and ma'oma'o into tourism infrastructure developments and other relevant tourism developments
10. National University of Samoa	Governmental	Incorporate national measures for the conservation and protection of the manumea and ma'oma'o into relevant university graduate and post-graduate courses and training
11. O le Siosiomaga Society Inc.	Non Governmental Organisation	Assist the awareness, education and capacity building programs in villages for the conservation and protection of the manumea and ma'oma'o
12. Matua i le Oo Environment Trust Inc.	Non Governmental Organisation	Assist the awareness, education and capacity building programs in villages for the conservation and protection of the manumea and ma'oma'o
13. Lalomanu	Village	Landowners of key forest habitats of the manumea and ma'oma'o
14. Ti'avea	Village	Landowners of key forest habitats of the manumea and ma'oma'o
15. Saleilua	Village	Landowners of key forest habitats of the manumea and ma'oma'o
16. Matafa'a	Village	Landowners of key forest habitats of the manumea and ma'oma'o
17. Falese'ela	Village	Landowners of key forest habitats of the manumea and ma'oma'o
18. Tafua	Village	Landowners of key forest habitats of the manumea and ma'oma'o
19. Fa'ala	Village	Landowners of key forest habitats of the manumea and ma'oma'o
20. Salelologa	Village	Landowners of key forest habitats of the manumea and ma'oma'o
21. Asau	Village	Landowners of key forest habitats of the manumea and ma'oma'o
22. Aopo	Village	Landowners of key forest habitats of the manumea and ma'oma'o
23. Letui	Village	Landowners of key forest habitats of the manumea and ma'oma'o
24. SPREP	Intergovernmental Organisation	Facilitate the mobilization of regional and international financial and expertise resources to support programs for the conservation and protection of the manumea and ma'oma'o
25. UNDP	Intergovernmental Organisation	Facilitate the mobilization of regional and international financial and expertise resources to support programs for the conservation and protection of the manumea and ma'oma'o
26. FAO	Intergovernmental Organisation	Facilitate the mobilization of regional and international financial and expertise resources to support programs for the conservation and protection of the manumea and ma'oma'o

3. An important emphasis in the workshop was to ensure their deliberations would recognize the needs and aspirations of people and communities who own the key selected areas for the conservation of these bird species. Representatives of these communities were present in the workshop.

Table 2: List of Workshops Participants:					
UPOLU FAO Conference Room, Apia, 29 September 2006			SAVAII Evaeva Club, Salelologa, 3 October 2006		
NO	NAME	ORGANISATION / VILLAGE	NO	NAME	ORGANISATION / VILLAGE
1	Penina Motusaga	Saleilua	1	Samaga Lemi	Aopo
2	Umufaiesea Ueli	Saleilua	2	Peka Matofai	Aopo
3	Sapi Elu	Saleilua	3	Agai Ailama	Aopo
4	Aitu Misi	Saleilua	4	Faiga Selau	Asau
5	Pau Elu	Saleilua	5	Tufi Selau	Asau
6	Seuava Mataese	Ti'avea	6	Vaai Reupoamo	Asau
7	Ianeta Seuava	Ti'avea	7	Faleata Taufaga	Asau
8	Sefo Seumalu	Ti'avea	8	Iaulualo Toetau	Fa'ala
9	Seuava Atonio	Ti'avea	9	Lafai Aloese	Fa'ala
10	Laasia Pisa	Ti'avea	10	Lesina Luamanu	Salelologa
11	Mefi Tautiaga	Ti'avea	11	Faua Laauli	Salelologa
12	Ava Toa	APS	12	Galumalemana Veve	Salelologa
13	Faataualofa Mata'i	MAF (Quarantine)	13	Luamanuvae Fereti	Salelologa
14	Tumema Tia'i	MAF(Livestocks)	14	Etevisa Tiotala	Salelologa
15	Mafutaga Tinifu	MAF(Crops)	15	Luamanuvae Ene	Salelologa
16	Ulrike Hertel	MESC(Culture)	16	Poulava Foaimaua	Tafua
17	Fia'u Faletoese	METI	17	Fagaomanu Situ'a	Tafua
18	Frances Brown	MNRE	18	Valu Uiese	Tafua
19	Mutaaga Isara	MNRE	19	Poloefa Sios	Tafua
20	Mary James	MWCSD	20	Lemaota Sione	Tafua
21	Meia Su'a	MWCSD	21	Namulauulu Keneti	Fogapoa
22	Seuiasomalua Hakai	MOJ	22	Fou Toetu	MAF(Crops)
23	Ana Tira'a	SPREP	23	Tali Suafo'a	MAF(Crops)
24	James Atherton	CI	24	Luileomanu Evagelia	MWTI
25	David Butler	SPREP/MNRE	25	Tolutasi Faiga	MWTI
26	Falefaga Toni Tipakma'a	MNRE	26	Silafaga Aiolupotea	MAF (Crops)
27	Susau Siolo	MNRE	27	Susau Siolo	MNRE
28	Natasha Doherty	MNRE	28	Falefaga Toni Tipama'a	MNRE
29	Talie Foliga	MNRE	29	Faumuina Sailimalo Pati Liu	MNRE
30	Malaefono Maua	MNRE	30	Tepa Suaesi	MNRE
31	Tepa Suaesi	MNRE	31		
32	Faumuina Sailimalo Pati Liu	MNRE	32		
33	Tuiolo Schuster	MNRE			
34	Ieru Solomona	MNRE			

II. WORKSHOP RESULTS

- Table 2 above lists the participants of the two workshops: For Upolu fifteen (15) came from government ministries; two (2) from national non-governmental organisations; three (3) from regional organisations and eleven (11) from the village communities. For Savaii; ten (10) came from government organisations and twenty two (22) from the village communities. There were sixty (60) people in the workshops, 70% represent the civil society and village communities and 30% represent government organisations. The participants from village communities were composed of high chiefs, women and youth representatives.
- Table 3 below lists the participants responses to key issues of the recovery plans for the manumea and ma'oma'o. The workshop discussed the key issues in groups of areas selected for the conservation of the two target birds: For Upolu the two groups are Ti'avea and Aleipata area and Saleilua and Falealili area including the O le Pupu Pu'e National Park. For Savaii, the two groups are the Asau-Aopo-Letui area and the Salelologa-Tafua-Fa'ala area – or the Tafua peninsula.
- A powerpoint presentation on the 'Saving the Manumea and Ma'oma'o' project was presented at the start of each workshop and an discussion paper (all in Samoan) on the key issues of the two recovery plans was also disseminated to the participants before the workshop discussion groups.

III. CONCLUSIONS

7. The participants of both workshops have all expressed their respective organisations and villages full support for the implementation of the recovery plans and have emphasized as in the results of their deliberations on key issues the critical importance of implementing these plans at the village level in locations of forests where the manumea and ma'oma'o are found.
8. In general, the participants' comments strongly recommend capacity building for village communities as the most appropriate way forward in ensuring the sustainability of efforts that will effectively preserve and improve the populations and the targeted bird species and their native forest habitats.

Key issues	Ti'avea Group	Saleilua Group (views different from Ti'avea)	Salelologa–Tafua–Fa'ala Group (views different from Ti'avea & Saleilua)	Asau – Aopo – Letui Group (views different from Ti'avea, Saleilua & Salelologa-Tafua-Fa'ala)
1. What are appropriate measures to address the following threats? (a) hunting;	<i>Register all firearms legally Village Councils make and enforce bans on the hunting of birds and support the enforcement of the central government regulations Govt. to make special laws banning the hunting of the manumea and the ma'oma'o like the ban on pigeon hunting Enforce permits on the sales of bullets by stores</i>	<i>Village Councils to Implement processes for the prosecution and punishment of illegal hunters of pigeons and doves</i>	<i>Ban all native forest use unless specifically allowed by the Village Councils</i>	<i>Establish sustainable levels for hunting of pigeons, doves and bats as its impossible stop people from hunting but we can educate them on those sustainable levels to maintain good numbers of these resources. These measures should be strongly monitor and enforced by the Village Councils.</i>
(b) forest clearance for agriculture;	<i>Landowners must demarcate areas for logging and areas for protection of their remaining forests Landowners make plans for appropriate use of selected areas of their forests s/a for logging</i>	<i>Government and villages to carry out forest replanting programs in all open forest areas</i>	<i>Establish appropriate and sustainable forest clearance policies and measures for agriculture</i>	<i>Forest clearance for agriculture must be properly planned and carry out to minimize impacts on birds needs, however large scale logging and sawmilling must now be banned completely</i>
(c) forest logging;	<i>Village Councils must now ban sawmilling activities especially villages which have not experience forest logging, unless they are offered millions of dollars for logging, i.e. increase the costs to make it uneconomical to log remaining forests Review legislations on the environmental impacts of logging activities</i>	<i>Government to ban logging of remaining native forests and the logging of forests on watershed areas</i>	<i>Establish appropriate and sustainable forest clearance policies and measures for logging practices</i>	
(d) forest clearance for utility development: roading, water, electricity, etc;	<i>Institute national measures to control forest clearance in utility developments</i>	<i>Establish strong inter-ministerial consultations/communication for incorporating conservation of forests and birds measures in public utility developments</i>	<i>Establish appropriate and sustainable forest clearance policies and measures for utility developments</i>	
(e) invasive species	<i>Eradicate invasive animals such as the myna birds and red vented bulbuls MAF to cooperate in the management of invasive species MAF and MNRE to provide incentives/rewards for the eradication of invasive animals</i>	<i>Promote awareness and education of village communities on the management of invasive species of plants and animals</i>	<i>Use chemical poisoning to eradicate and control invasive species of plants and animals</i>	
2. How appropriate and acceptable is the zoning approach in village development and if not appropriate what is an alternative approach?	<i>The framework of zoning village lands into different uses – protection zone, buffer zone and development zone – is a most welcomed and very appropriate management system to implement in Ti'avea</i>	<i>Agree as an appropriate approach but a program of awareness and education on this framework must be conducted for village communities</i>	<i>Agree with the approach but must be left to each village and their Council to determine its application in their own setting</i>	<i>Agree with the approach but we should establish an effective pilot site to model it for the benefit of the whole country – perhaps start at Aopo as a pilot site</i>
3. What are key areas of skills and knowledge to include in awareness and education programs?	<i>Use real-life samples or models of the manumea and ma'oma'o in school and community awareness campaigns Build a captivity centre/zoo of for public appreciation of the target birds Resolve people's reference to the manumea as the manuma Produce promotional stamps of the manumea and ma'oma'o</i>	<i>Knowledge of the manumea and ma'oma'o – their habits, sources of feed, and their conservation needs Training for village communities, youth and tourist operators on skills for monitoring and rehabilitating these birds and their habitats Benefits for village communities from the conservation of these birds</i>	<i>Provide special trainers and establish a training centre for training villagers on the conservation and rehabilitation of native birds and native forests</i>	<i>Education and awareness must be based in the villages whose forest the birds are found as ultimately it there where the birds should be conserved not with the public. A core group of individuals in each village should be trained to monitor and carry out necessary recovery activities for the birds and their habitats</i>
4. What are problems / issues to address in the management of forests? What are solutions for improving the	<i>Resolve these problems at the level of the Village Councils Refer the daily management of forests to the village women committees to handle Encourage the Samoa Tourism Authority to</i>	<i>Key problems are the: Continuing decrease in remaining native forests Village capacities for forest replanting and regeneration</i>	<i>The problem is the lack of guidance – the Government must provide effective guidelines and guidance to village communities on the management and use of forest resources.</i>	<i>The solution is to stop any further logging or clearance of remaining native rainforests at the village and individual levels</i>

Table 3: Workshop Groups Responses to Keys Issues of the Recovery Plans for the Manumea and Ma'oma'o.				
Key issues	Ti'avea Group	Saleilua Group (views different from Ti'avea)	Salelologa–Tafua–Fa'ala Group (views different from Ti'avea & Saleilua)	Asau – Aopo – Letui Group (views different from Ti'avea, Saleilua & Salelologa-Tafua-Fa'ala)
management of forests?	<i>promote the conservation of forests through eco-tourism</i>			
5. Please clarify roles of each of the following key players in the conservation of the manumea and ma'oma'o: (a) Council of Chiefs	<i>Make rules for the protection of the birds; oversee and collaborate with village mayors in the implementation of conservation activities for the manumea and ma'oma'o</i>	<i>Correspondence and liaison with government ministries on assistance for village developments and conservation programs Provide examples of genuine conservation and effective resource management for the whole village</i>		<i>Council of Chiefs should establish a definite framework for the protection of the environment and the conservation of nature within their village lands – a framework that should consists of rules and regulations to enforce it</i>
(b) Young men	<i>Implement on the ground decisions by the Village Council</i>			
(c) Women & Girls	<i>Provide advice and lead the education and awareness raising programs in the village</i>			
(d) Hunters	<i>Must wait for any sanctions and enforce rules by the Village Council</i>			<i>Hunters should have as a policy the protection (non-hunting) of the manumea and ma'oma'o</i>
(e) Schools	<i>Implement education of children on knowledge of the two birds and their habitats</i>			<i>Establish a definite framework for banning any further logging of remaining native forests</i>
(f) Loggers/Sawmillers	<i>Provide proper management of forest logging Must wait for sanction and abide by Village Council rules and regulations</i>		<i>Implement forest regeneration and forest replanting programs</i>	<i>Special subjects should be held in schools on the conservation of the manumea and ma'oma'o</i>
(g) Farmers	<i>Recognize and enforce policies for the sustainable use of lands to minimize impacts and maintain sustainability of remaining forests</i>	<i>Support the replanting of native forests</i>	<i>Ban the slash and burn practices by farmers to clear land for plantation</i>	<i>Farmers should have as a policy the protection of the manumea and ma'oma'o</i>
(h) Churches	<i>Promote spiritual responsibilities for the conservation and protection of the manumea and ma'oma'o in their sermons and educational programs</i>			<i>Include in theological training of priests and pastors subjects for the preservation of nature</i>
(i) Private Businesses	<i>Promote knowledge and conservation of the manumea and ma'oma'o through their customers and through sponsorships of media awareness programs</i>			<i>The business community should recognize and support village conservation programs</i>
6. What determined the successes and failures of the following initiatives? How can we achieve and maintain success in each of these initiatives? (a) Eco-tour trails, birdwatching camps, etc.	<i>Level of support and ownership by the village community State of the forest and biodiversity enrichment of those forests Level of forest use – on how sustainable those development practices are and their impacts on eco-tour activities Level of benefits to the community</i>	<i>Success – good management, reaping of real benefits, unity, and good land use practices Failure – continuing hunting & forest clearance, lack of capacity, disunity and non-existence of definite plans</i>		<i>In general the successes, failures and sustainability of village projects depends on the leadership quality and management style of the Village Council and as well as the degree of support and commitment of the Village Community</i>
(b) Replanting of forests for timber in opened forest areas	<i>Level of management of the replanting programs Level of forest regeneration by forest users such as forest loggings to go have forest replanting programs at the same time Level of effectiveness of monitoring by the Village Council Level of village capacities for addressing severe land degradations – soil erosion, land slides and flood plains</i>	<i>Success – good management, reaping of real benefits, unity, and good land use practices Failure – continuing hunting & forest clearance, lack of capacity, disunity and non-existence of definite plans</i>		
(c) Improvement of current agriculture and initiation	<i>Keep livestock and plantations in properly fenced areas to reduce or eliminate their</i>	<i>Success – good management, reaping of real benefits, unity, and good land use practices</i>		<i>Successes and failures depend on the level of clarity and coherence of and farmers commitment to policies</i>

Table 3: Workshop Groups Responses to Keys Issues of the Recovery Plans for the Manumea and Ma'oma'o.				
Key issues	Ti'avea Group	Saleilua Group (views different from Ti'avea)	Salelologa–Tafua–Fa'ala Group (views different from Ti'avea & Saleilua)	Asau – Aopo – Letui Group (views different from Ti'avea, Saleilua & Salelologa-Tafua-Fa'ala)
of new potential agricultural developments that are environmentally sound and sustainable	<i>impacts on protected areas Address land degradations from agriculture development Ban the use of agricultural chemicals</i>	<i>Failure – continuing hunting & forest clearance, lack of capacity, disunity and non-existence of definite plans</i>		<i>and principles for good farming practices</i>
7. What are existing programs of the following key ministries and organizations which have relevant actions for the conservation of forests and birds such as the manumea and ma'oma'o in Samoa?	<i>MAF-Livestock monitor and address introduction of invasive animals</i>	<i>Sustainable livestock programs</i>		<i>Promote the zoning of landuse to definitely select appropriate uses of different available lands already cleared of forests and lands for reforestation and conservation of remaining native forests</i>
(a) MAF-Livestock				
(b) MAF-Crops	<i>MAF-Crops monitor and research solutions to control and eradicate invasive plants and animals</i>	<i>Promotion of organic farming</i>		<i>Start research also for control of invasive species affective native forests</i>
(c) MAF – Quarantine	<i>MAF-Quarantine enforce legislations which bar the introduction of new invasive species into the country</i>			
(d) MAF – Information	<i>MAF-Information promotes knowledge of sustainable agriculture which compliment conservation programs</i>			<i>Incorporate in their program the dissemination of information on the conservation of birds and forests</i>
(e) MESCS	<i>Production of study guides, teacher training and teaching aids on the target birds for use in the relevant school curriculum</i>			
(f) MWCS D	<i>Development of village community and individual roles for the conservation of birds and forests</i>		<i>Program for the revival of the art of weaving the original traditional fine mat which utilizes feathers of the manumea and other pigeons and doves</i>	<i>Program to support the formulation and implementation of village planning frameworks for conservation and sustainable development of natural resources</i>
(g) MWTI	<i>(no representative)</i>		<i>(no representative)</i>	
(h) SWA	<i>(no representative)</i>		<i>(no representative)</i>	
(i) EPC	<i>(no representative)</i>		<i>(no representative)</i>	
(j) METI	<i>(no representative)</i>	<i>Promotion of organic farming</i>	<i>(no representative)</i>	
(k) OLSSI	<i>(no representative)</i>		<i>(no representative)</i>	
(l) SPREP	<i>Sharing of information, lessons learned and good practices of bird recovery plans from across the region, e.g. the Kakerori Recovery Plan in the Cook Islands</i>			
(m) UNDP	<i>(no representative)</i>			
(n) FAO	<i>(no representative)</i>			
8. What are other relevant issues that should be included in these Plans?	<i>Effective communication between the ministries (MNRE, MAF, etc.) and village communities Identification and mobilization of financial resources for the recovery plans Improving the local management of financial assistance provided for development and conservation projects</i>		<i>Build a bird captivity facility to both rehabilitate the birds and educate the public on their values and conservation needs.</i>	<i>Program of periodic national stakeholder consultations or meetings to assess the state of the environment and the conservation of nature</i>

ANNEX 3: RECORD SHEET FOR MA'OMA'O CASUAL OBSERVATIONS

Your name:

Location:

Date of Observation	Example: 25/08/06				
Time of observation	10.35am				
Observations (bird seen or heard, or both and the number of birds)	1 bird seen and heard, 1 bird heard but not seen				
Location of bird (describe in relationship to your home)	Both birds were to the north of house in steep forested gully area				
Describe what the bird was doing when you observed it (eg sitting, feeding etc)	The bird that was seen was sitting on a branch high in a maota tree				
Weather conditions (eg fine and sunny, partly cloudy, overcast but dry, rainy (heavy or light drizzle))	Overcast with a light drizzle				
Wind (strong wind, light breeze or no wind at all)	Light breeze				