

IMPORTANT BIRD AREAS OF SAMOA

Prepared by:
Toeolesulusulu Cedric Schuster



Birdlife International in partnership with Conservation International, O Le Siosiomaga Society Incorporated and the Ministry of Natural Resources and Environment



ACKNOWLEDGEMENT

We wish to acknowledge several people who contributed tremendous effort and time in the preparation of this report. Firstly we extend a special appreciation for James Atherton of Conservation International for the numerous contribution to the report which includes the preparation of all the maps, the Samoa Review of Important Bird Areas report he wrote with Toni Tipamaa of MNRE which provided the majority of the information used in this report, and additional time spent on the review and commenting on the report. We also wish to acknowledge with appreciation all the members of the Steering Committee for the this project which includes, Fiu Mataese Elisara (Director of OLSSI); Toni Tipamaa (ACEO MNRE); Tapa Suaesi (SPREP) and finally Steve Cranwell and James Millett of Birdlife Pacific for all the time and effort put in to review and comment on the report as well as organizing and presenting at the national and community workshops.

Contents

| | |
|--|----|
| ACKNOWLEDGEMENT | 2 |
| BACKGROUND | 4 |
| SAMOA | 4 |
| GEOGRAPHIC STRUCTURE | 4 |
| ECONOMY | 4 |
| ENVIRONMENT | 5 |
| TERRESTRIAL BIODIVERSITY | 5 |
| KEY BIODIVERSITY AREAS | 6 |
| BIRDS OF SAMOA | 6 |
| Knowledge Base | 6 |
| Land Bird Species of Concern | 7 |
| Sea/shore birds | 9 |
| LEGISLATION | 10 |
| CONSERVATION INITIATIVES | 10 |
| KEY THREATS TO SAMOA’S BIRDS | 11 |
| CONSERVATION MEASURES FOR SAMOA’S BIRDS | 11 |
| IMPORTANT BIRD AREAS | 16 |
| CRITERIA FOR IBA IDENTIFICATION | 16 |
| SITE DELINEATION | 17 |
| SAMOA’S IMPORTANT BIRD AREAS | 18 |
| CONSULTATIONS | 18 |
| IBA SITE ACCOUNTS | 21 |
| WS 01: ALEIPATA MARINE PROTECTED AREA | 21 |
| WS 02: EASTERN UPOLU CRATERS | 25 |
| WS 03: UAFATO-TIAVEA FOREST | 29 |
| WS 04 O LE PUPU-PU’E NATIONAL PARK | 32 |
| WS 05 APIA CATCHMENTS | 36 |
| WS 06 CENTRAL SAVAII RAINFOREST | 40 |
| Tables and Figures | |
| Figure 1: Map of Samoa | 6 |
| Figure 2: Map of Important Bird Areas in Samoa | 20 |
| Table 1: Status of Samoa’s Land Birds of Concern | 8 |
| Table 2: Status of Samoa’s Sea/shore Birds of Conservation Concern | 9 |
| Table 3: Summary of global IBA criteria | 16 |
| Table 4: Important Bird Areas in Samoa | 18 |
| Annexes | |
| ANNEX 1: TERMS OF REFERENCE | 44 |
| ANNEX 2. LIST OF TRIGGER SPECIES | 46 |
| ANNEX 3. THRESHOLDS FOR COLONIAL WATERBIRD POPULATIONS | 50 |

BACKGROUND

The identification of Important Areas for Birds in Samoa is the culmination of work initiated through the partnership of Conservation International's Key Biodiversity Areas program and the Birdlife Pacific's IBA project. This included an initial review of Samoa's Important Bird Areas in 2008 prepared by James Atherton and Toni Tipamaa. This report provided the foundation document that was updated through field surveys to some of the potential IBA sites, literature review, national and community workshops facilitated by Cedric Schuster of Pacific Environment Consultants. The final report was compiled by Pacific Environment Consultants in consultation with the Ministry of Natural Resources and Environment, Birdlife International, O le Siosiomaga Society and Conservation International's Key Biodiversity Areas project. The project started in 2007 and finally completed in 2010.

The Terms of Reference is attached as Annex 1.

SAMOA

Samoa consists of two main islands namely Upolu and Savaii, and seven smaller islands all of which lie between about 13° and 14° South latitude and 171° and 173° West longitude. The total land area is 2,934 km² and a sea area within Samoa's Exclusive Economic Zone is about 128,000 km². The most populous and developed island is Upolu, where the national capital Apia is located. About 80 per cent of the land is under customary tenure. The 2006 Census enumerated a population of 179,186 with males 92,961 and females 86,225. Compared to last census conducted in 2001, the country's population grew by 1.4%. (Samoa Census 2008).

GEOGRAPHIC STRUCTURE

Approximately 50% of Savaii and 40% of Upolu are comprised of steep slopes derived from volcanic activity. Both islands have central mountain ridges formed from a chain of volcanic peaks and craters. In Upolu, the mountain range runs along the length of the island with some peaks rising to more than 1000 metres above sea level, surrounded by flat and rolling coastal plains. Savaii contains a central core of volcanic peaks reaching 1858m at the highest point and encompassed by a series of lava-based plateaus, hills and coastal plains.

All the islands of Samoa were formed by volcanic activity. Most soils were derived from basaltic volcanic flows differing largely in age and type of deposit. The young volcanic structure of the island means the soils are, in places, very porous for leaching into the groundwater system.

ECONOMY

The economy is relatively small with aggregate Gross Domestic Product (GDP) of SAT 1,129,520,000 and a per capita income of SAT\$6392 as of 2005. Economic performance is constrained by distance to markets, a small local market, and a limited labor base that cannot compete with Asian countries in labour intensive production and a high vulnerability to natural disasters particularly cyclones and now earthquakes and tsunamis.

The agricultural sector accounts for 10-15% of GDP and is characterized by a substantial subsistence base which continues to provide a source of livelihood for over 80% of the population and a high level of domestic food security. More recently, the fisheries sector has replaced agriculture as the dominant export earner. The significance of agriculture and livestock farming to bird conservation is the rate at which land is cleared and used for farming, thus affecting bird habitats. Tourism continues to increase as an income earner with the growth of small scale beach 'fale' accommodations and new medium size hotels now under construction. The increase in flight regularity and availability of cheap fares from the two main airlines operating in Samoa has seen a steady increase in tourism. The premise of Samoa as a clean environment tourist site and promotion of environmentally friendly tourist operation and sites is seen as a positive note for conservation programs. The recent Tsunami of September 29th 2009 showed how vulnerable the tourism industry is, as the vast majority of the beach fales and hotels on the south of Samoa were all destroyed leaving the industry in real trouble.

ENVIRONMENT

Samoa's biological environment reflects a rich natural heritage of high species diversity and endemism. It is estimated that Samoa supports 775 native vascular plant species of which approximately 30% of the angiosperms are endemic. There are about 280 genera of native angiosperms (more than any other archipelago in Polynesia). In addition, there are about 250 introduced plant species and 47 threatened plants. Samoa's fauna consists of 21 butterfly species, 11 species of reptiles, 43 resident bird species eight of which are endemic, and three flying fox species. (Samoa NBSAP 2001)

Samoa's NBSAP classified 19 terrestrial ecosystems based on Pearsall and Whistlers Ecosystem Mapping Survey of 1991. From the 19 ecosystem types, the Samoa NBSAP combined them into 5 common vegetation types, which are littoral vegetation, swamp and herbaceous marsh, rainforest, volcanic vegetation, and secondary or disturbed forest.

This biodiversity constitutes an essential aspect of the Samoan culture, with many cultural proverbs and oratory traditions derived from or reflecting relationships with the forests, reefs, marine life and land animals.

The smallness and geographical isolation of Samoa's islands from continental landmasses resulted in the high level of species endemism. At the same time, the same factors provide the seeds for its ecological fragility and vulnerability. For instance, many species have limited defenses against aggressive invasive species, and while endemism is high at the species level, it is less diversified at higher taxa levels. Genetic variability is thus limited.

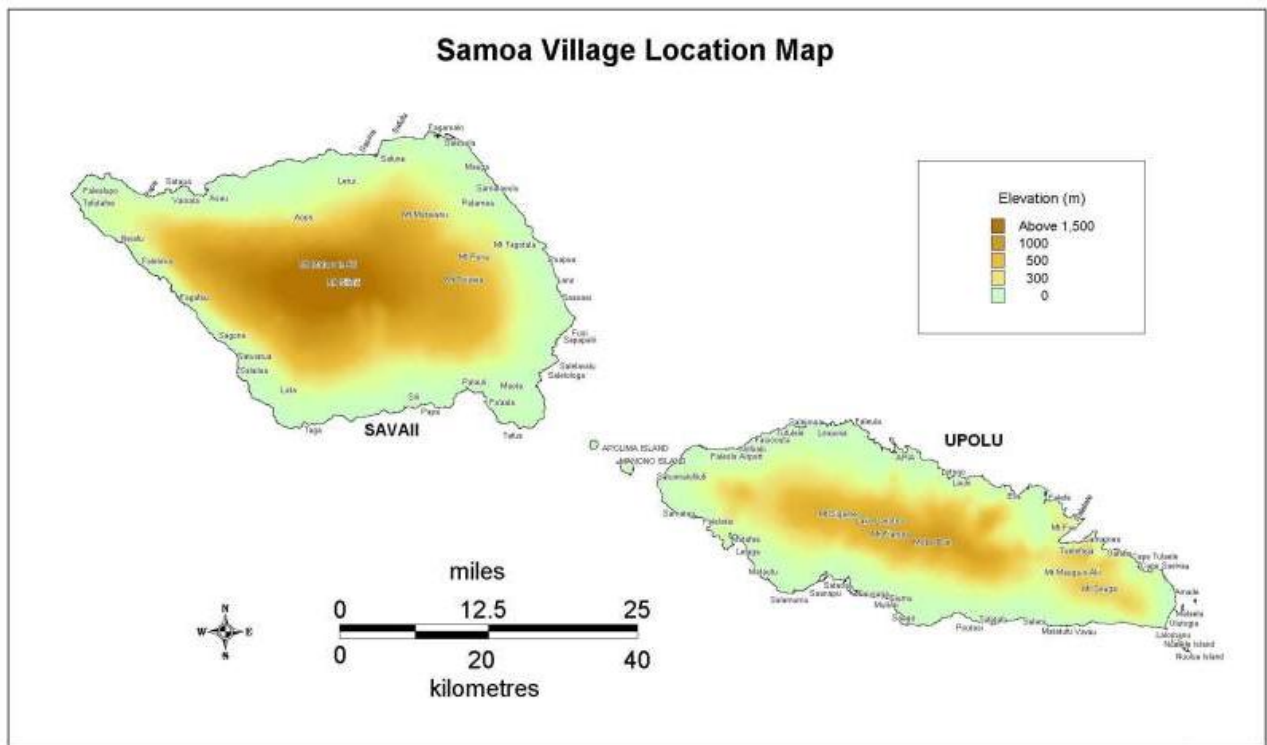
The ecological vulnerability inherent in its smallness, isolation, and limited genetic variability is exacerbated by the ever present threat of natural events such as cyclones, climate variability, and the impacts of human activities.

TERRESTRIAL BIODIVERSITY

Samoa was once completely covered by indigenous lowland and upland rainforests with wetlands mostly along the coastal areas and mixed upland swamp forest. Since the mid 1800's when commercial farming operations were introduced, the native forests primarily on the western side of Upolu were cleared for coconut and rubber tree plantations. Agricultural development since independence in the 1960's provided another push in forest clearing as forests made way for plantations, farms and logging operations throughout the whole country. In the early 1990's, major cyclones of Ofa in 1990 and Val in 1991 decimated the remaining indigenous forest stands to the point that the majority of Samoa's forest is a mixture of secondary growth and disturbed forests. Upland Savaii' montane and cloud forests were able to recover from the cyclones and remain the only undisturbed native forest left in Samoa while all the forest on Upolu Island has been affected in some way.

A few locations on Upolu such as the Uafato-Tiavea forest have remained pristine with limited disturbance from cyclones, while the rest of the upland forests are now a mixture of native plants mixed with invasive plants such as *Merremia spp*, *Albizia spp*, and rubber trees of *Funtumia elastic* and *Castillo a elastica*, and *Sapthodea Campanulata*.

Figure 1: Map of Samoa



KEY BIODIVERSITY AREAS

Key Biodiversity Areas (KBAs) are sites of global significance for biodiversity conservation, identified using transparent, globally standard criteria. The KBA concept extends to all taxonomic groups the data-driven methodology employed to identify Important Bird Areas (IBAs). KBAs can be used as a tool by governments, inter-governmental organizations, NGOs, the private sector, and other stakeholders to expand the protected area network in Samoa, and, more generally, for targeting conservation action for all taxonomic groups, not just birds. Additionally, KBAs provide the building blocks for landscape-level conservation planning and for maintaining effective ecological networks aimed at preventing biodiversity loss.

The goal of the KBA approach is to identify, document, and safeguard networks of sites that are critical for the conservation of all globally important and threatened biodiversity. KBAs are identified using the same standard criteria used to define IBAs, ie based on the widely-accepted conservation planning principles of vulnerability and irreplaceability. The vulnerability criterion captures sites important for species that are at risk of extinction, while sites meet the irreplaceability criterion if they hold geographically concentrated species, or those with few spatial options for their conservation.

Since the KBA approach follows that for IBA definition, but extends it to cover other taxonomic groups, all IBAs are automatically KBAs, but not all KBAs are IBAs. Currently Samoa has 6 IBAs, while the list of KBAs is in the process of being revised to include all the IBAs that have now been identified for Samoa.

BIRDS OF SAMOA

Knowledge Base

Samoa's land bird fauna is well studied. The first written records of bird observations in Samoa date from 1838 when the first bird species list for Samoa was prepared by the United States Exploring Expedition (Wilkes 1845). This was followed by a detailed description of birds as well as their cultural importance in Kramer's History of Samoa Volume 2.

Since then numerous amateur and professional ornithologists have recorded their observations of the birds of Samoa and a number of manuals, field guides and reports on the birds of Samoa or of the South West Pacific have been written. In addition numerous national and local biological surveys and assessments have included bird survey elements. The most recent set of national bird surveys were conducted in 2006 and culminated in the preparation of species recovery plans for the manumea (Tooth-billed Pigeon (MNRE 2006a) and the Ma'oma'o (Ma'o) (MNRE 2006b).

Despite the significant body of knowledge on Samoan land birds there is still limited knowledge of Samoan bird ecology and behaviour. Another major gap is the status of the seabird fauna of Samoa.

Currently, 81 bird species have been recorded in Samoa; this includes 31 breeding native land birds, one possibly extinct native land bird (the Samoan Moorhen), 4 breeding introduced birds, approximately 10 breeding seabirds and 35 migrants or vagrants. Nine of the land birds are endemic to Samoa and another 7 are regional endemics or near endemics.

An unknown number of bird species have been extirpated since human arrival in Samoa, but fossil evidence from other islands in the region indicates that it may be very significant (e.g. see Steadman 1995).

Land Bird Species of Concern

Samoa and American Samoa form the Samoan Island EBA 203 as defined by Birdlife International. Within the Samoan Islands EBA, 20 bird species are identified as having restricted range, making it important as trigger species for conservation efforts for the establishment of Important Bird Areas. Of the 20 restricted range species for the Samoa EBA, 19 are found in Samoa. Six of these, (together with Bristle-thighed curlew - a wide-ranging but scarce shorebird), are also considered to be globally threatened based on surveys and assessments over the last 20 years using IUCN Red List criteria (BirdLife International 2003). All the land bird species classified as globally threatened are endemic at least to the sub-species level to Samoa.

Samoan Moorhen (*Gallinula pacifica*): The Samoan Moorhen (Critically Endangered) has not been recorded in Samoa for over 80 years, apart from an unconfirmed sighting in the 1980s in upland forest west of Mt Elietoga.. Due to the absence of a full national survey to determine its status, the bird cannot be declared to be extinct as yet.

Tooth-billed Pigeon (*Didunculus strigirostris*): The Tooth-billed pigeon is classified as Endangered. Of the surveys conducted and recording documented, the tooth-billed pigeon is present in only a few locations and only in few numbers where they range from one to 20 birds recorded. According to MNRE who were involved in the latest survey of the tooth-billed pigeon, approximately 500 birds could be found in Samoa. The main threat to the tooth-billed pigeon is the diminishing of its main habitats due to land clearing and forest conversion along with predation from cats and rats. The tooth-billed pigeon is not specifically hunted but has been reported to be shot accidentally by hunters.

Mao (*Gymnomyza samoensis*): the Mao is another of Samoan endemic birds identified as Endangered on the IUCN Red list. The 2006 review further confirms this as it is recorded in very few areas and populations recorded from these areas usually number below 10 in each site. The Mao was once found throughout the country but is now only confined to higher altitude areas away from settlements due to the loss of habitat and predation from cats and rats.

Shy Ground-dove (*Gallicolumba stairi*): the shy ground dove is classified as globally vulnerable. Nationally it is considered the most endangered of Samoa's native land birds due to its being present in only very few numbers and recorded from less than 5 sites nationally. The main cause of concern for the Shy Ground dove it that it is a mostly ground foraging bird, thus making it vulnerable to predation from cats and rats. The decreasing availability of forest cover further limits the Shy Ground dove's habitat.

Samoan Flycatcher (*Myiagra albiventris*): The Samoan Flycatcher global status is classed as Vulnerable. The

population was severely impacted by the Cyclones that devastated Samoa in the 1990's as was recorded by Parks, et al (1992) and Schuster, et al (1997). Nevertheless, in the recent field surveys for the IBA report, the Samoan Flycatcher was found to be in very healthy populations not only IBA sites visited, but recorded regularly around the country in all locations including close to homes. Of the IBA sites surveyed, the Samoa Flycatcher was recorded in the range of 20-30 birds, furthermore, informal observations along other sites including along the roadsides and near homes, all yielded densities of over 2 per count. This is a good indication that the population is recovering.

Samoan White-eye (*Zosterops samoensis*) The Samoan white-eye, globally classed as Vulnerable, is found only on the uplands of Savaii at heights of above 800m. Due to limited surveys into the uplands of Samoa, the Samoan white-eye has not been well studied or recorded. But the recordings from the uplands of Savaii (Schuster et al, 97) approximates the populations to over 500, based on the recordings of over 50 birds on the north western part of Savaii and over 30 along the Salailua upland forest.

In addition the Samoan triller (*Lalage sharpei*) is classed, globally, as Near Threatened. This was once a common bird in the forests of Samoa, but due to loss of habitat is now restricted to upland forests of Upolu and Savaii. Recording and sightings of this bird are only from a few locations and in numbers ranging from 1 to 5 at any one sight.

In addition to these, there are another 12 species that are globally considered to be Restricted Range species, but not classed as of immediate conservation risk. Finally six species are considered to be of national conservation concern as determined through the National Biodiversity Strategy and Action Plan. IBAs within a country are selected to provide at least 1, preferably more, sites that contain an assemblage of these Restricted Range species. 4 of these species are also considered to be national conservation concern while the remaining 2, island thrush and scarlet robin, are included below but were not used as IBA trigger species.

Table 1 below shows the status of these 21 Samoan land bird species of global or national conservation concern, along with an indication of which are IBA trigger species.

Table 1: Status of Samoa's Land Birds of Concern

| NO | Common Name | Scientific Name | Samoan Name | STATUS |
|----|--------------------------|---------------------------------------|--------------|--------|
| 1 | Samoan Moorhen | <i>Gallinula pacifica</i> | Puna e | CR/RR |
| 2 | Shy Ground-dove | <i>Gallicolumba stairi</i> | Tuaimao | VU/RR |
| 3 | Many-coloured Fruit-dove | <i>Ptilinopus perousi</i> | Manuma | RR/cc |
| 4 | Purple-capped Fruit-dove | <i>Ptilinopus porphyraceus</i> | Manutagi | RR |
| 5 | Tooth-billed Pigeon | <i>Didunculus strigirostris</i> | Manumea | EN/RR |
| 6 | Blue-crowned Lorikeet | <i>Vini australis</i> | Segavao | RR/cc |
| 7 | Flat-billed Kingfisher | <i>Todiramphus recurvirostris</i> | Tiotala | RR |
| 8 | Wattled Honeyeater | <i>Foulehaio carunculatus</i> | lao | RR |
| 9 | Ma o | <i>Gymnomyza samoensis</i> | Ma oma o | EN/RR |
| 10 | Cardinal Myzomela | <i>Myzomela cardinalis</i> | Segasegamauu | RR |
| 11 | Polynesian Triller | <i>Lalage maculosa</i> | Miti | RR |
| 12 | Samoan Triller | <i>Lalage sharpei</i> | Mitivao | NT/RR |
| 13 | Samoan Whistler | <i>Pachycephala flavifrons</i> | Vasavasa | RR |
| 14 | Samoan Fantail | <i>Rhipidura nebulosa</i> | Seu | RR |
| 15 | Samoan Flycatcher | <i>Myiagra albiventris</i> | Tolaifatu | VU/RR |
| 16 | Scarlet Robin | <i>Petroica multicolor pusila</i> | Tolaiula | cc |
| 17 | Samoan White-eye | <i>Zosterops samoensis</i> | Matapapa e | VU/RR |
| 18 | Samoan Starling | <i>Aplonis atrifusca</i> | Fuia | RR |
| 19 | Polynesian Starling | <i>Aplonis tabuensis</i> | mititai | RR/cc |
| 20 | Island Thrush | <i>Turdus poliocephalus samoensis</i> | Tutumalili | cc |
| 21 | Red-headed Parrotfinch | <i>Erythrura cyaneovirens</i> | Sega ula | RR/cc |

| Legend:++ | | |
|-----------|-----------------------|--|
| CR | Critically endangered | ...it is facing an extremely high risk of extinction in the wild in the immediate future, judged to be a probability of 50% in 10 years |
| EN | Endangered | ‘. .it is not Critical but is facing a very high risk of extinction in the wild in the near future, judged to be a probability of 20% in 20 years.’ |
| VU | Vulnerable | ‘. .it is not Critical or Endangered but is facing a high risk of extinction in the wild in the medium-term future, judged to be a probability of 10% in 100 years.’ |
| NT | Near threatened | does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future. |

Sea/shore birds

The knowledge of the population and breeding status of seabirds in Samoa is poor making it difficult to review and update the existing list of seabird species of conservation concern. Based on the available literature, approximately 12 seabird and shorebird species that are of global or national conservation concern have been recorded in Samoa (see table 2).

The globally threatened Bristle-thighed Curlew *Numenius tahitiensis* is a regular northern winter migrant in small numbers. Several seabird species of global concern are either passage migrants, visitors or status unknown in Samoa. These include the Phoenix Petrel *Pterodroma alba*; Tahiti Petrel *Pseudobulweria rostrata*; Collared Petrel *Pterodroma brevipes* and Polynesian Storm Petrel *Nesofregatta fuliginosa*. Recent surveys in American Samoa have recorded the Tahitian petrel, Audubon’s shearwater *Puffinus iherminieri* and possibly the Wedge-tailed shearwater *Puffinus pacificus* and Phoenix petrel as breeding on Lata Mountain on Ta’u (O’Connor and Rauzon 2004). Further survey work, and estimates of the number of breeding birds present, is required to get a better understanding of the status of these and other seabirds in Samoa. No IBA sites have been identified, to date, for these species in Samoa.

Table 2: Status of Samoa’s Sea/shore Birds of Conservation Concern

| NO | Common Name | Scientific Name | Samoan Name | STATUS |
|-----------|-------------------------|--|-------------|--------|
| | Phoenix Petrel | <i>Pterodroma alba</i> | | EN |
| | Collared Petrel | <i>Pterodroma brevipes</i> | | NT |
| | Tahiti Petrel | <i>Pseudobulweria rostrata</i> | | NT |
| 1 | Polynesian Storm-petrel | <i>Nesofregatta fuliginosa</i> | Ta’l’o | VU |
| 2 | Red-Tailed Tropic Bird | <i>Phaethon rubricauda</i> | Tavaeula | cc |
| 3 | Masked Booby | <i>Sula dactylatra</i> | Fuao | cc |
| 4 | Great Frigatebird | <i>Fregata minor</i> | Taio | cc |
| 5 | Lesser Frigatebird | <i>Fregata ariel</i> | Taio | cc |
| 6 | Crested Tern | <i>Sterna bergi</i> | Gogo | cc |
| 7 | Sooty Tern | <i>Sterna fuscata</i> | Gogo | cc |
| 8 | Black-Naped Tern | <i>Sterna sumatrana</i> | Gogo | cc |
| 9 | Bridled Tern | <i>Sterna anaethetus</i> | Gogo Uli | cc |
| 10 | Blue Noddy | <i>Procelsterna cerulea</i> | Laia | cc |
| 22 | Black Noddy | <i>Anous minutus</i> | Gogo | cc |
| | Bristle-Thighed Curlew | <i>Numenius tahitiensis</i> | Tuliolovalu | VU |
| Legend:++ | | | | |
| EN | Endangered | ‘. .it is not Critical but is facing a very high risk of extinction in the wild in the near future, judged to be a probability of 20% in 20 years.’ | | |
| VU | Vulnerable | ...it is not Critical or Endangered but is facing a high risk of extinction in the wild in the medium-term future, judged to be a probability of 10% in 100 years.’ | | |
| NT | Near-threatened | does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future. | | |

| | | |
|----|----------------------|--|
| CC | Conservation concern | '... a national category for species that are of local conservation concern even though they may not be considered to be globally threatened. This category includes seabirds that breed in Samoa that may be regionally common but are locally rare and threatened in Samoa.' |
|----|----------------------|--|

LEGISLATION

Samoa has long established legislative frameworks for the conservation of birds compared to other nations in the Pacific. However, despite the established legal frameworks, especially the control of hunting of national species of concern, hunting practices continues to date as there is almost no monitoring of activities. Public awareness campaigns have been undertaken in recent years.

- **Protection of Wildlife Regulation 2004:** Provides for the protection of bird species of concern based on the NBSAP. This regulation includes all the birds threatened or vulnerable at the national level. This is an amendment of the Wild Animal Ordinance 1960 and 1993.
- **Wild Animal Ordinance 1960 - (1993 Amendment):**
- **Land Survey and Environment Act 1989:** The main guiding act regulating the work of environmental protect and conservation in Samoa. With regards to Bird Conservation, the Act provides for the establishment of protected areas and species conservation programs
- **National Parks and Reserves Act 1974:** The first legislative framework provided for the establishment of protected areas in the form of National Parks or Reserves.

Apart from the legislation, Samoa has developed a Biodiversity Policy which provides guidance on the implementation of the Biodiversity Conservation work in Samoa.

Since Samoa's accession to the Convention of Biological Diversity in 1996 and other regional environmental conventions such as Apia Convention and the SPREP Convention, conservation has steadily been integrated into the mainstream of government work in Samoa over 20 years where the Ministry of Natural Resources and Conservation is amongst the largest and most well resourced agency.

Over the 20 year period, Samoa has also developed a National Environment Management Strategy and a National Biodiversity Strategy and Action Plan (NBSAP) as part of Article 7 of the CBD. The NBSAP is now the main plan for which all conservation work in Samoa stems from, including the conservation and sustainable use of ecosystems and species such as birds.

CONSERVATION INITIATIVES

Bird conservation work in Samoa first gained momentum as part of the National Parks and Reserve Act and programs in the 1970's when the Wild Animals Ordinance recognized the need to protect some of Samoa's bird species of importance and those considered threatened. Since then, bird's surveys have been an integral part of ecological surveys undertaken in Samoa, including the 2 major surveys covering the lowland and uplands forests of Samoa. Additionally, several bird specific surveys were conducted for globally endangered birds and some birds of national concern. With birds already identified as a important component of the conservation programs in Samoa, several public awareness programs and conservation initiatives have been implemented over the past 20 years. Below are some of the recent bird conservation related initiatives in Samoa.

Bird Surveys

- 1991: National Ecological Survey of Lowland Forest Ecosystems of Samoa (Parks, et al 1992)
- 1997: National Ecological Survey of Upland Forest Ecosystems of Samoa (Schuster, et al, 1997)
- 2003: Study on the Puna'e (Samoa Moorhen)
- 2004: Bird Blood Sampling & Netting Survey (MNRE/MWR)
- 2006: Tua'imeo Survey
- 2006: Manumea Ma'oma'o Survey

- 2009: Important Bird Areas of Samoa

Awareness Programs

- 1994 Manumea Public Awareness campaign

Invasive Species control

- 2004-2009: Myna Bird Control Project
- 2006-2009: Aleipata Islands Ecosystem Restoration Project

KEY THREATS TO SAMOA'S BIRDS

1. Invasive species: the presence of rats and cats along with Common and Jungle Myna in the wild are seen as the main invasive species threat to the bird populations. Although detailed surveys have yet to be undertaken to estimate the extent of these species impact on the native birds, it is thought that the presence of these invasive species can pose a real threat to the native bird species. Other invasive species such as yellow ants, *Merremia*, etc may also have significant impact on the bird populations.
2. Natural Disasters such as cyclones and fires: The biggest impact on the native population of birds was the devastation brought upon by Cyclones Val and Ofa in the early 1990's. The impact of the cyclones include birds killed during the cyclones and those affected due to the loss of habitat and food supplies over 3 months for the birds as the forests slowly regenerated and recovered.
3. Habitat conversion: the conversion of native habitats such as forests for agriculture, logging operations, settlements, farming and hydro electric dams continually reduces the habitat for bird's survival.
4. Hunting and Trade: hunting for domestic and local commercial market is a threat that if not policed properly may have a major impact on native bird populations. Especially some of the less threatened but important birds that may be captured and/or killed for food and/or cultural activities.

CONSERVATION MEASURES FOR SAMOA'S BIRDS

Conservation programs have started or are being proposed for most of the Key Biodiversity Areas around Samoa. Furthermore, Samoa has implemented several specific bird conservation programs since the 1990's including scientific surveys and recovery programs for the IUCN Red Listed tooth-billed pigeon and mao, as well as the nationally threatened and globally vulnerable Shy-Ground Dove.

The Government of Samoa has also enacted bird specific legislations in the form of the Wild Animals Ordinance which banned the hunting of birds of conservation concern as identified in the NBSAP.

Despite the proactive conservation programs and legislative frameworks already put in place, the fact is, the threats cannot be totally controlled, so the following actions are identified as supporting existing programs to ensure the long term survival of birds and the protection of key habitats for birds.

1. With the impact of natural disasters being the biggest threat to Samoa's birds IBA sites need to also represent areas that will provide refuge for birds around country if and when their normal habitats are destroyed by natural disasters.
2. As this IBA study was based on previous, sometimes quite old, bird survey data for most species, a comprehensive survey needs to be undertaken for all IBAs, for other areas that were initially considered for IBA status, but also for the wider countryside, to produce an overall population density and status of Samoan birds.
3. Developing community involvement and community ownership of these IBAs is essential if these areas are to remain of importance for the birds and other wildlife within their boundaries.
4. Particular effort should go into identifying potential IBAs for breeding seabirds – using an approach similar to the recent survey work on American Samoa.

5. Projects targeted at providing local communities with stable long-term incomes that are undertaken on sites that have been identified as IBAs should consider how to best combine both the local community needs and conservation measures that would benefit both birds and other wildlife.

REFERENCES

- Armstrong J.S. 1932. *Hand-list to the Birds of Samoa*. John Bale, Sons and Danielson Ltd, London.
- ANZDEC. 1990. *Land Resources Planning Study: Western Samoa*. Final Report. ADB TA No. 1065-SAM. Lower Hutt: DSIR Division of Lands Surveys and Social Sciences.
- Ash mole, 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.
- Atherton, J and Tipamaa, T; 2009, Review of Status of Knowledge of Samoan Avifauna,
- ,U. 1997. *Report on the Conservation Area at Uafato – Studies on the Avifauna*, SPREP, Apia; Samoa.
- Beichle, U. 1997. *Report on a proposed Conservation Area at Saanapu-Sataoa Mangrove Wetland – Studies on the Avifauna*, SPREP, Apia; Samoa.
- Beichle, U. 1991. Status and acoustical demarcation of pigeons of Western Samoa. *Notornis* 38(1): 81-86.
- Beichle, U. 2006. *Saving Samoa's Critically Endangered Maomao and Manumea*. Unpublished final report to Wildlife Conservation Society, June 2006, 20pp
- Bellingham, M. and Davis, A. 1988. Forest bird communities in Western Samoa. *Notornis* 35: 117-1 28
- Birdlife International. 2000. *Threatened Birds of the World*, Lynx Editions and Birdlife International, Barcelona, Spain & Cambridge, U.K.
- Birdlife International. 2009
<http://www.birdlife.org/datazone/ebas/index.html?action=EbaHTMLDetails.asp&sid=202&m=0>
- Butler, D. J. 2005. *Restoration of Nu'utele & Nu'ulua, Aleipata Islands, Samoa*. Protection of Friendly Ground Dove during Proposed Rat Eradication. Unpublished report for Govt of Samoa.
- Butler, D. J. 2006. *Restoration of Nu'utele & Nu'ulua Islands, Aleipata Island Group, Samoa. Report of expedition to trial the capture and holding of friendly ground doves (Galicolumba stairi)*. Unpublished report for Samoa Ministry of Natural Resources, Environment & Meteorology, Secretariat of the South Pacific Regional Environment Programme and Pacific Programme of the Cooperative Islands Initiative.
- Clarkson, B.D., Dugdale, J.S., Whistler, W.A., Butler, D., Schuster, C., Robinson, T. 1995. *Technical Report on the Pilot Study of the Upland Ecosystems of Western Samoa*. Landcare Research, Wellington, New Zealand.
- Dhondt, A.1976. Bird Observations in Western Samoa. *Notornis* 23: 29-43.
- Elmqvist, T., Cox, P.A., Pierson, E.D., and Rainey, W.E. 1998. *The Rain Forest and the Flying Foxes. An Introduction to the Rain Forest Preserves on Savai, Western Samoa*. Seacology Foundation and Faasao Savaii.
- Government of Samoa. 2001. *Samoa's Biodiversity Strategy and Action Plan. Keep the Remainder of the Basket*. Government of Samoa, Apia.
- Holloway, C.W., Floyd, C.H. 1975. *A National Parks System for Western Samoa*. United Nations Development Advisory Team for the South Pacific.
- Kramer, A. 1995 *The Samoan Islands Volume II* (translated by Dr. Theodore Verhaaren); Polynesian Press

- Lovegrove, T., Bell, B. and Hay, R. 1992. *The indigenous Wildlife of Western Samoa: The Impacts of Cyclone Val and a Recovery and Management Strategy*. NZ Ministry of Conservation
- Masibalavu, V.T., and Dutson, G. 2006. *Important Bird Areas in Fiji*. Birdlife International.
- Mayr, E. and Jacques, F. L. 1978. *Birds of the Southwest Pacific: A Field Guide to the Birds of the Area Between Samoa, New Caledonia, and Micronesia (new edition)*. Tuttle, Rutland, Vermont. 316 pp.
- Mayr, E. 1945 Bird Habitat of the Southwest Pacific. *Audubon magazine*. 47:207-211
- Merlin, M. D. and Juvik, J. O. 1985. Bird Protection in Western Samoa. *Oryx: Journal of the Flora and Fauna Society Vol 19:97-103*.
- Mittermeier, J. 2006. Searching for Samoa's Mysterious Moorhen. *Yale Environmental News*. Spring 2006, Vol 11. no 2: 19-20
- MNRE, 2006a. *Recovery Plan for the Manumea or Tooth-billed Pigeon (Didunculus strigirostris)*. Ministry of Natural Resources and Environment, Government of Samoan, Apia, Samoa.
- MNRE, 2006b. *Recovery Plan for the Ma'oma'o or Mao (Gymnomyza samoensis)*. . Ministry of Natural Resources and Environment, Government of Samoan, Apia, Samoa.
- Muse, C. and Muse, S. 1982. *The Birds and Birdlore of Samoa = O Manu Ma Talaaga O Manu O Samoa*. Pioneer Press, Wala Wala, Washington, for the National Audubon Society. 156 pp. illus.
- O'Connor, P.J and Rauzon, M. J. 2004. *Inventory and Monitoring of Seabirds in National Park of American Samoa*. University of Hawaii at Manoa. Technical Report 136.
- Ogle, C.C. 2001. Exotic plants of the Aleipata Islands, Samoa. *Institute of Applied Sciences Technical Report No. 200 1/08*. The University of the South Pacific, Suva, Fiji.
- Ollier, C.D., Whistler, W.A. and Amerson, A.B. 1979. *O le Pupu Pu'e National Park*. United Nations Development Advisory Team for the Pacific, Suva, Fiji.
- Parrish, R., Stringer, I and Lester, P. 2004. Fauna survey of the Aleipata Islands, Samoa. 3rd Progress Report. *Institute of Applied Sciences Technical Report No. 2004/05*. Institute of Applied Sciences, the University of the South Pacific, Fiji.
- Park, G., Hay, J., Whistler, W.A., Lovegrove, T and Ryan, P. 1992. *The National ecological Survey of Western Samoa: the conservation of biological diversity in the coastal lowland of Western Samoa*. New Zealand Department of Conservation.
- Pearsall, S. H. and Whistler, W. A. 1991. *Terrestrial ecosystem mapping for Western Samoa*. Report to the Government of Samoa by South Pacific Regional Environment Programme and East-west center, Environment and Policy Institute, Honolulu, US. 72pp
- Schuster, C., Whistler, W.A. and Tuiailemafua, S. 1997. *The Conservation of Biological Diversity in Upland Ecosystems of Samoa*, New Zealand Ministry of Foreign Affairs and Trade.
- Steadman, D. W. 1995. Prehistoric Extinctions of Pacific Island Birds: Biodiversity Meets Zooarchaeology. *Science* 267: 1123-1131
- Stringer, I., Parrish, R. and Bassett, S. 2003. Report on the second monitoring visit to Nu'utele and Nu'ulua Islands, Samoa. *Institute of Applied Sciences Technical Report No. 2003/11*. Institute of Applied Sciences, the University of the South Pacific, Fiji.

Stringer, I., Parrish, R. and Sherley, G. 2003. Report on the first monitoring visit to Nu'utele and Nu'ulua Islands 25 – 31 July 2000. *Institute of Applied Sciences Technical Report No. IAS 2003/10*. Institute of Applied Sciences, the University of the South Pacific.

Taulealo, T. I. 1993. *Western Samoa State of the Environment Report*. SPREP, Apia; Samoa

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

Tipama'a, T. and Beichle U., 2006. *RNHP Manumea Maomao Bird Survey Data*, in draft, (personal communications)

Tipama'a, T., 2001. *Preliminary Status Report on Bird Counts on Selected Monitoring Sites On Upolu & Savaii*, Unpublished final report . June 2001. 7pp

Watling, D. 2001. *A Guide to the Birds of Fiji and Western Polynesia including American Samoa, Niue, Samoa, Tokelau, Tonga, Tuvalu and Walis & Futuna*. Suva, Fiji, Environment Consultants (Fiji) Ltd.

Wilkes, Lt. C. 1845. *Narrative of the US Exploring Expedition During the Year 1 838,39,40, 4 1,42*. Philadelphia 5 Vol.

IMPORTANT BIRD AREAS

IBAs are internationally recognized sites which are vital for the conservation of birds. They are identified using standard set of four globally selection criteria (Table 5). In order to qualify as an IBA, a site must meet or exceed one or more of the criteria and thresholds indicated in the Birdlife International guidelines. To ensure compatibility and consistency amongst the sites and countries, the criteria are applied as objectively and as consistently as possible. There are no set size limits for IBAs.

IBA designations are not legally binding or obligatory for landowners to protect, but they only highlight sites that are important for the survival of globally significant birds. Organizations and Government Agencies can utilize the information as guides to undertake conservation for birds and other important biodiversity in the identified sites. IBAs are important not only for the conservation of birds, but also important for the conservation of important habitats for other biodiversity. Therefore the designation of an area as IBA further highlights the importance of native flora and fauna in such as area with its protection bound to ensure survival of large number of non-bird taxa.

As most of Samoa’s native forests have been disturbed either from land clearing, or cyclones, land birds of Samoa have also adapted to the changing forest condition and now inhabit areas that are least affected by human disturbances and invasive animal species such as cats and rats.

CRITERIA FOR IBA IDENTIFICATION

The criteria used to identify IBAs in the Pacific are the standard ones used to identify globally important IBAs across the world (Table 3). In order to ensure consistency and comparability with other countries, the criteria are applied objectively and consistently. In some instances, it is necessary to interpret the criteria in a way that is more useful in the Pacific context. All such instances are explained in the accompanying notes.

Table 3: Summary of global IBA criteria

| Category | Criterion | Notes |
|---|--|--|
| A1. Globally threatened species | The site regularly holds significant numbers of a globally threatened bird species. | The site qualifies if it is known or thought to support a bird species categorised by BirdLife/IUCN as Critically Endangered or Endangered (“regular presence”), or as Vulnerable (a population of more than 10 pairs or 30 individuals) or as Near Threatened (10 pairs or 30 individuals for non-passerines or 30 pairs or 90 individuals for passerines). |
| A2. Restricted-range species | The site is known or thought to hold a significant component of the restricted-range bird species whose breeding distributions define an Endemic Bird Area (EBA) or Secondary Area (SA). | The site qualifies if it forms one of a set selected to ensure that, as far as possible, the assemblage of restricted range species identified are adequately covered by the range of IBAs identified in the country. |
| A3. Biome-restricted assemblages | The site is known or thought to hold a significant component of the group of bird species whose distributions are largely or wholly confined to one biome. | Since the country is covered in one EBA this makes this criteria redundant nationally. |

| Category | Criterion | Notes |
|---|---|--|
| A4. Congregations or or or | (i) The site is known or thought to hold, on a regular basis, $\geq 1\%$ of a biogeographic population of a congregatory waterbird species. | This applies to waterbird species as defined in <i>Waterbird Population Estimates</i> ⁴ . Biogeographic populations are defined for each species, populations estimated and 1% thresholds are set. No sites have been identified using this criterion in Samoa, to date. |
| | (ii) The site is known or thought to hold, on a regular basis, $\geq 1\%$ of the global population of a congregatory seabird or terrestrial species. | This applies to terrestrial species and those seabird species not covered in <i>Waterbird Population Estimates</i> ⁴ . Where quantitative data are lacking, numerical thresholds are set by estimating 1% of the global population. . No sites have been identified using this criterion in Samoa, to date. |
| | (iii) The site is known or thought to hold, on a regular basis, $\geq 20,000$ waterbirds or $\geq 10,000$ pairs of seabirds of one or more species. | This is based on a Ramsar Convention criterion for waterbirds, adapted and extended for seabirds. No sites have been identified using this criterion in Samoa, to date. |
| | (iv) The site is known or thought to exceed thresholds set for migratory species at bottleneck sites. | Thresholds are set regionally or inter-regionally, as appropriate. . No sites have been identified using this criterion in Samoa, to date. |

SITE DELINEATION

In addition to the above criteria, an IBA should, as far as possible, meet the following three criteria:

1. Be different in character or habitat or ornithological importance from the surrounding area.
2. Exist as an actual or potential protected area, with or without buffer zones, or be an area which can be managed in some way for nature conservation.
3. Alone or with other sites, be a self-sufficient area, which provides all the requirements of the birds that it is important for during the time they are present.

Where extensive tracts of continuous habitat occur which are important for birds, only characteristics 2. And 3. Apply. Due to the nature of island biogeography, where it is difficult to differentiate specific habitats for bird populations of birds and the customary land tenure system, delineating boundaries for Samoa's IBA's employed the following additional information below that best suits the local condition.

- Sites should, where possible include all areas where populations of birds of conservation concern that meet IBA thresholds have been recorded in the past 20 years;
- Sites should include complete forest blocks from the latest Samoa forest cover map (1999);
- 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 the boundaries of proposed sites for conservation as identified in the National Biodiversity Strategy and Action Plan.
- Classification for Samoa IBA sites are also limited to sites where there is sufficient information for the assessment. Some potential sites may prove at least as suitable as the sites currently selected – once survey work has been undertaken.

SAMOA'S IMPORTANT BIRD AREAS

From the bird surveys information, a total of 13 sites were noted to have the presence of at least 3 species of globally significant birds and at least 10 trigger species for IBA sites, while complying with the boundary delineation identified above. The sites include Central Savaii Rainforest, Aopo Lowlands, Tafua Peninsula lowland Rainforest, Falealupo Peninsula lowland forest, Taga-Salailua lowland rainforest, Mt Tafuaupolu, Apia Catchments, O Le Pupu National Park, Central Upolu Highlands, Eastern Upolu Craters, Uafato-Tiavea lowland Rainforest, and Aleipata Islands Marine Protected Area. Upon further review, 7 of the sites were withdrawn as IBAs since survey data were insufficient to make informed decisions on their status for declaration as IBA. Nevertheless, these sites, namely Aopo Lowlands, Tafua Peninsula lowland Rainforest, Falealupo Peninsula lowland forest, Taga-Salailua lowland rainforest, Mt Tafuaupolu and Central Upolu Highlands, are highly recommended for further survey work and potential declaration in the future.

Figure 2 is a map of the 6 IBAs while table 4 below shows the trigger species and IBA qualifying criteria for the proposed sites. Full descriptions of the IBAs are in the following chapter.

Table 4: Important Bird Areas in Samoa

| Site Number | Site Name | Trigger Species Found in Site | IBA qualifying criteria | Area (Ha) |
|-------------|------------------------------|---|-------------------------|-----------|
| WS01 | Aleipata MPA | Shy Ground-dove, Tooth-billed Pigeon, Samoan Flycatcher, +15 of 20 RR species | A1 ,A2 | 156 |
| WS02 | Eastern Upolu Craters | Shy Ground-dove Tooth-billed Pigeon, Mao, Samoan Triller, Samoan Flycatcher, +16 of 20 RR species, | A1 and A2 | 4759 |
| WS03 | Uafato -Tiavea forest | Tooth-billed Pigeon, Mao, Samoan Triller Samoan Flycatcher, +15 of 20 RR species | A1 ,A2 | 2330 |
| WS04 | O le Pupu-Pu'e National Park | Tooth-billed Pigeon, Mao, Samoan Triller, Samoan Flycatcher, +15 of 20 RR species | A1, A2, | 4228 |
| WS05 | Apia Catchments | Tooth-billed Pigeon, Mao, Samoan Triller, Samoan Flycatcher, +16 of 20 RR species | A1 and A2 | 8428 |
| WS06 | Central Savaii rainforest | Samoan Moorhen (possibly), Shy Ground-dove, Tooth-billed Pigeon, Mao, Samoan Triller, Samoan Flycatcher, Samoan White-eye, +19 of 20 RR species | A1, A2 | 72699 |

CONSULTATIONS

The IBA identification process was supervised by a project steering committee which included all the main stakeholders involved in bird conservation in Samoa, namely O le Siosiomaga Society, the Ministry of Natural Resources and Environment, the Secretariat of the Pacific Regional Environment Program (SPREP) with Conservation International and Birdlife International. The steering committee with the consultant reviewed and agreed on the initial IBA sites based on the information presented. To gather general public comments and input, public consultations in the form of workshops were undertaken

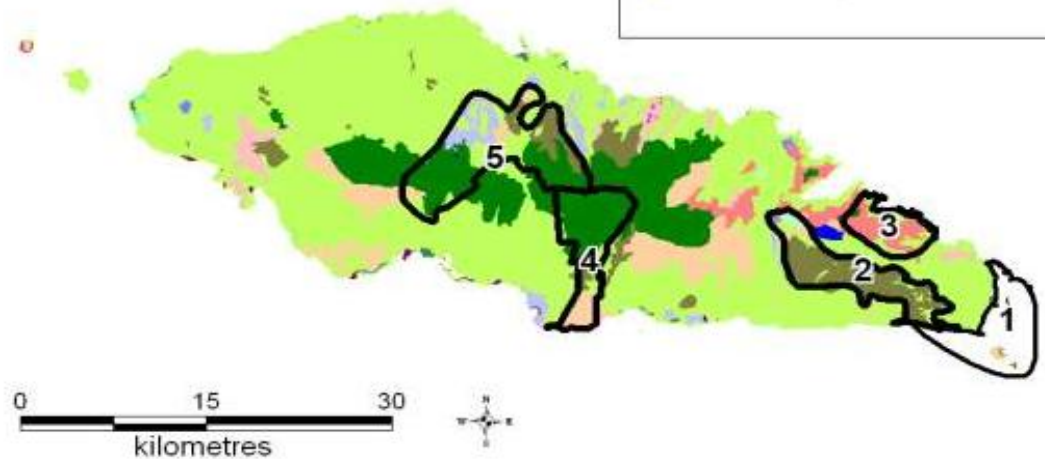
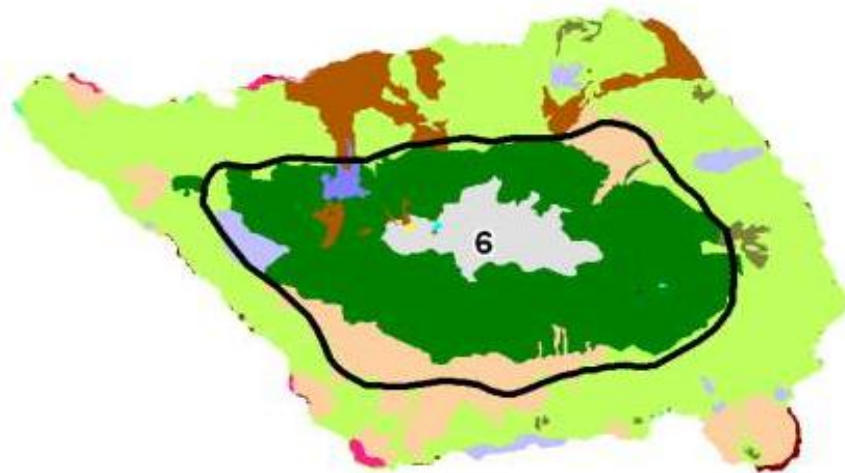
A national workshop was facilitated by PECL both as awareness raising for the national stakeholders on the importance of birds and to present for public consultation the proposed IBA's for Samoa. The workshop was held July of 2009 with participation from the MNRE, Ministry of Agriculture and Fisheries, Samoa Tourism Authority, Division of Rural Affairs, the NGO community as well as participating partners in this project, which includes OLSSI, CI, BI, and MNRE. SPREP through its avifauna and invasive species staff also participated. The workshop was facilitated by the consultant with presentations by Birdlife Pacific on the IBA and the work of Birdlife International. A presentation by Conservation International was given on its Key Biodiversity Area program which is collaborating with the IBA on the identification of sites. A representative from the Fiji IBA also presented on the IBA work in Fiji including the surveys and the consultations on the establishment of IBAs at the community level. The consultant presented the tentative IBA sites for consultations and input into existing or planned work in the proposed IBA

sites for potential collaboration in the future. At the completion of the workshop, the participants supported the proposed 6 IBAs.

Along with the national workshop, a community awareness workshop was held in the village of Maagiagi two days following the national workshop, to raise awareness of communities on the value of birds, the importance of bird conservation and the IBA program. The site was selected due to it being one of the IBA identified sites. The workshop was attended by members of the Maagiagi village council of chiefs, womens committee representatives and youth. The workshop started with the traditional ava ceremony conducted by the village chiefs of Maagiagi to welcome the group. After the ava ceremony, presentations were given by the MNRE on the Government Wild Ordinance Regulations and Bird conservation programs. This was followed by presentations by the Fiji representative on IBA's in Fiji and the proposed IBA for Maagiagi presented by the consultant. Following the presentations, discussions were held on the value and importance of birds, which resulted in the village council of Maagiagi endorsing its support for the establishment of the IBA as well as bird conservation programs coordinated by MNRE. At the end of the workshop, a birdwatching field visit was done by the villagers and members of Birdlife Pacific to the Faleolefee site.

Figure2: Map of Important Bird Areas in Samoa

Samoa's Important Bird Areas



Vegetation Type
(from Pearsall and Whistler 1991)

- Cloud forest
- Coastal forest
- Fernland
- Grassland
- Herbaceous Marsh
- Littoral forest
- Littoral scrub
- Lowland forest
- Mangrove forest
- Montane forest
- Ridge forest
- Swamp forest
- Secondary forest
- Volcanic succession
- Non-native ecosystem
- Lake
- Disturbed coastal
- Disturbed herbaceous marsh
- Disturbed littoral forest
- Disturbed lowland forest
- Disturbed mangrove forest
- Disturbed Ridge forest
- Disturbed swamp forest
- Disturbed secondary forest

| Site_No | Site_name | Land_Area_Ha |
|---------|-----------------------------|--------------|
| 1 | Aleipata MPA | 156 |
| 2 | Eastern Upolu Craters | 4,759 |
| 3 | Uafato-Tiavea forest | 2,330 |
| 4 | O le Pupu Pue National Park | 4,228 |
| 5 | Apia catchments | 8,428 |
| 6 | Central Savaii rainforest | 72,699 |

IBA SITE ACCOUNTS

WS 01 ALEIPATA MARINE PROTECTED AREA

Coordinates: -171.4227°; -14.0633°

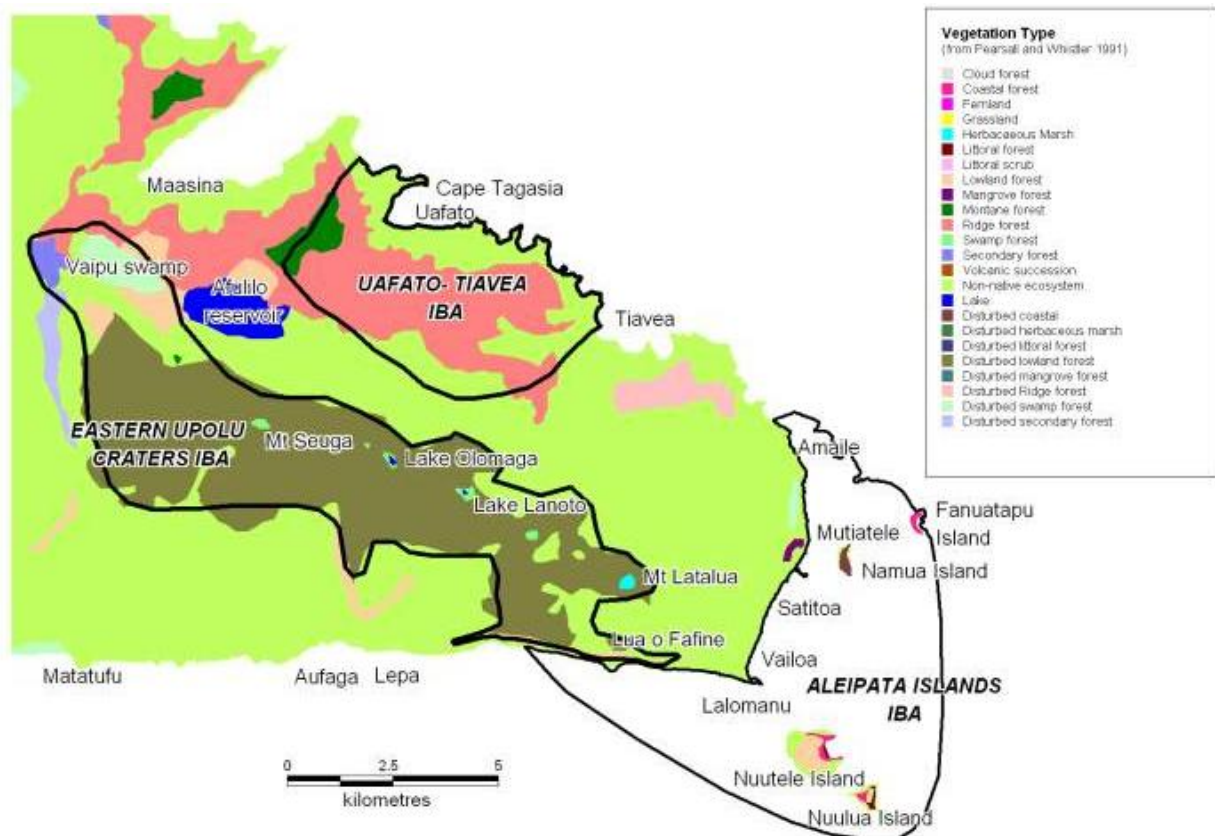
Area: 156. (Ha)

Altitude: 0-210m

Status: Marine Protected Area:

IBA Criteria: A1, A2

Site holds 3 of the 7 globally, or near threatened and 15 of the 20 restricted-range species of the Samoan Islands EBA



Summary

The Aleipata IBA follows the boundaries for the Aleipata MPA which includes the outer islands and the inshore reef of the Aleipata district. This IBA is of critical importance as a major site for nesting seabirds in Samoa as well as home to over five of the globally threatened land birds.

Site Description

The Aleipata MPA comprises of 4 small islands of the coast of Aleipata which are all lowland rainforests ecosystems. Mainland Aleipata includes an extensive intertidal zone which is home to migrating sea birds, and mangrove forest. The coastal area was designated as an MPA by the district as part of a GEF Medium size project in 2002.

The IBA is recognized as an important site due to the islands on Nuulua and Nuutele being main sea bird colonies and home to some of the very rare and threatened globally and national significant birds such

as the tooth-billed pigeon, and the Shy ground dove.

The inland craters of Aleipata provide a very important function both as refuge for birds during cyclones but also a feeding ground for the birds on the outer islands where regular daily migration of birds for feeding on the mainland occurs.

The keenness of the district shown in the establishment of the MPA and the area considered as prime tourist destination in Samoa bodes well for the conservation of birds. Bird Conservation program is already included in the MPA Management Plan. The coastal area and tourism industry for the area was recently decimated by the devastating tsunami of September 29th 2009.

Birds

Birds identified in the Aleipata IBA were compiled from surveys of the National ecological Surveys for Samoa's lowland and Upland Forests, bird surveys of the Aleipata MPA, and the Restoration of Aleipata Islands. Additional surveys were undertaken during the preparation of the IBA report.

From these surveys, three of the globally threatened bird species for Samoa were present. Of particular note is the presence of a Shy ground-dove population of over 60 on Nuutele Island. This is the highest number of shy ground-dove populations recorded in any one site around Samoa.

| Common name | Scientific name | A1 | A2 (203) | References |
|--------------------------|-----------------------------------|----|----------|--|
| Shy Ground-dove | <i>Gallinolumba stairi</i> | X | X | Lovegrove 92, Hay 91, Schuster |
| Many-coloured Fruit-dove | <i>Ptilinopus perousi</i> | | X | Lovegrove 92, Hay 91, Schuster |
| Tooth-billed Pigeon | <i>Didunculus strigirostris</i> | X | X | Lovegrove 92, Hay 91, Schuster Beichle 06 |
| Purple-capped Fruit-dove | <i>Ptilinopus porphyraceus</i> | | X | Lovegrove 92, Hay 91, Schuster |
| Blue-crowned Lorikeet | <i>Vini australis</i> | | X | Lovegrove 92, Hay 91, Schuster |
| Flat-billed kingfisher | <i>Todiramphus recurvirostris</i> | | X | Lovegrove 92, Hay 91, Schuster |
| Wattled honeyeater | <i>Foulehaio carunculatus</i> | | X | Lovegrove 92, Hay 91, Schuster |
| Cardinal Myzomela | <i>Myzomela cardinalis</i> | | X | Lovegrove 92, Hay 91, Schuster |
| Polynesian Triller | <i>Lalage maculosa</i> | | X | Lovegrove 92, Hay 91, Schuster |
| Samoan Flycatcher | <i>Myiagra albiventris</i> | X | X | Lovegrove 92, Hay 91, Schuster |
| Samoan Whistler | <i>Pachycephala flavifrons</i> | | X | Lovegrove 92, Hay 91, Schuster |
| Samoan Fantail | <i>Rhipidura nebulosa</i> | | X | Lovegrove 92, Hay 91, Schuster |
| Samoan Starling | <i>Aplonis atrifusca</i> | | X | Lovegrove 92, Hay 91, Schuster |
| Red-headed Parrotfinch | <i>Erythrura cyaneovirens</i> | | X | Lovegrove 92, Hay 91, Schuster |
| Polynesian Starling | <i>Aplonis tabuensis</i> | | X | Lovegrove 92, Hay 91, Schuster |

Seabirds

The site is of further importance with Nuutele and Nuulua Islands residence to the biggest seabird colony in Samoa. There are unconfirmed reports of the threatened bristle-thighed curlew *Numenius tahitiensis* and Polynesian Storm Petrel *Nesofregetta fuliginosa*. Phoenix Petrel *Pterodroma alba*; Tahiti Petrel *Pseudobulweria rostrata*; and Collared Petrel *Pterodroma brevipes*; from Nuulua Island.

Other Biodiversity

The IBA site is a major nesting site for the globally threatened hawksbill turtle and a foraging ground for the globally threatened green turtle and humpback whale, while the terrestrial biodiversity includes the threatened mangrove forests, and other biodiversity species such as the *Clinostigma samoense* (niu vao) and *Pteropus samoensis* (Samoan fruit bat).

Conservation

The IBA site is already under protection through the Aleipata MPA program. A rat eradication program is also underway on Nuutele and Nuulua islands as part of the Aleipata Islands Ecosystem Recovery Program funded through the CEPF.

References

- Atherton, J. 2008. Database on Birds of Samoa recordings
- Atherton, J. 2004. *Comparison of 1999 forest cover with previous forest covers maps*. Extract from GIS Design and Development 3rd Mission Final Report for FAO, December, 2004, Apia, Samoa.
- Atherton, J and Tipamaa, T; 2009, Review of Status of Knowledge of Samoan Avifauna,
- Beichle, U. 1991. Status and acoustical demarcation of pigeons of Western Samoa. *Notornis* 38(1): 81-86.
- Beichle, U. 2006. *Saving Samoa's Critically Endangered Maomao and Manumea*. Unpublished final report to Wildlife Conservation Society, June 2006, 20pp
- Birdlife International. 2000. *Threatened Birds of the World*, Lynx Editions and Birdlife International, Barcelona, Spain & Cambridge, U.K.
- Birdlife International. 2009
<http://www.birdlife.org/datazone/ebas/index.htm?action=EbaHTMLDetails.asp&sid=202&m=0>
- Butler, D. J. 2005. *Restoration of Nu'utele & Nu'ulua, Aleipata Islands, Samoa*. Protection of Friendly Ground Dove during Proposed Rat Eradication. Unpublished report for Govt of Samoa.
- Butler, D. J. 2006. *Restoration of Nu'utele & Nu'ulua Islands, Aleipata Island Group, Samoa. Report of expedition to trial the capture and holding of friendly ground doves (Galicolumba stairi)*. Unpublished report for Samoa Ministry of Natural Resources, Environment & Meteorology, Secretariat of the South Pacific Regional Environment Programme and Pacific Programme of the Cooperative Islands Initiative.
- Clarkson, B.D., Dugdale, J.S., Whistler, W.A., Butler, D., Schuster, C., Robinson, T. 1995. *Technical Report on the Pilot Study of the Upland Ecosystems of Western Samoa*. Landcare Research, Wellington, New Zealand.
- Dhondt, A.1976. Bird Observations in Western Samoa. *Notornis* 23: 29-43.
- Government of Samoa. 2001. *Samoa's Biodiversity Strategy and Action Plan. Keep the Remainder of the Basket*. Government of Samoa, Apia.
- Holloway, C.W., Floyd, C.H. 1975. *A National Parks System for Western Samoa*. United Nations Development Advisory Team for the South Pacific.
- Lovegrove, T., Bell, B. and Hay, R. 1992. *The indigenous Wildlife of Western Samoa: The Impacts of*

Cyclone Val and a Recovery and Management Strategy. NZ Ministry of Conservation

MNRE, 1996. Post Cyclone Bird Monitoring Program, unpublished

MNRE, 2006a. *Recovery Plan for the Manumea or Tooth-billed Pigeon (Didunculus strigirostris)*. Ministry of Natural Resources and Environment, Government of Samoa, Apia, Samoa.

MNRE, 2006b. *Recovery Plan for the Ma'oma'o or Mao (Gymnomyza samoensis)*. . Ministry of Natural Resources and Environment, Government of Samoa, Apia, Samoa.

Ollier, C.D., Whistler, W.A. and Amerson, A.B. 1979. *O le Pupu Pu'e National Park*. United Nations Development Advisory Team for the Pacific, Suva, Fiji.

Parrish, R., Stringer, I and Lester, P. 2004. Fauna survey of the Aleipata Islands, Samoa. 3rd Progress Report. *Institute of Applied Sciences Technical Report No. 2004/05*. Institute of Applied Sciences, the University of the South Pacific, Fiji.

Park, G., Hay, J., Whistler, W.A., Lovegrove, T and Ryan, P. 1992. *The National ecological Survey of Western Samoa: the conservation of biological diversity in the coastal lowland of Western Samoa*. New Zealand Department of Conservation.

Pearsall, S. H. and Whistler, W. A. 1991. *Terrestrial ecosystem mapping for Western Samoa*. Report to the Government of Samoa by South Pacific Regional Environment Programme and East-west center, Environment and Policy Institute, Honolulu, US. 72pp

Schuster, C., Whistler, W.A. and Tuiailemafua, S. 1997. *The Conservation of Biological Diversity in Upland Ecosystems of Samoa*, New Zealand Ministry of Foreign Affairs and Trade.

Schuster, C. 2009. Bird counts of Nuutele Island (unpublished accounts)

Stringer, I., Parrish, R. and Bassett, S. 2003. Report on the second monitoring visit to Nu'utele and Nu'ulua Islands, Samoa. *Institute of Applied Sciences Technical Report No. 2003/11*. Institute of Applied Sciences, the University of the South Pacific, Fiji.

Stringer, I., Parrish, R. and Sherley, G. 2003. Report on the first monitoring visit to Nu'utele and Nu'ulua Islands 25 – 31 July 2000. *Institute of Applied Sciences Technical Report No. IAS 2003/10*. Institute of Applied Sciences, the University of the South Pacific.

Taulealo, T. I. 1993. *Western Samoa State of the Environment Report*. SPREP, Apia; Samoa

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

Tipama'a, T. and Beichle U., 2006. *RNHP Manumea Maomao Bird Survey Data*, in draft, (personal communications)

Tipama'a, T., 2001. *Preliminary Status Report on Bird Counts on Selected Monitoring Sites On Upolu & Savaii*, Unpublished final report . June 2001. 7pp

WS 02: EASTERN UPOLU CRATERS

Coordinates: -171.5002°;-14.0115°

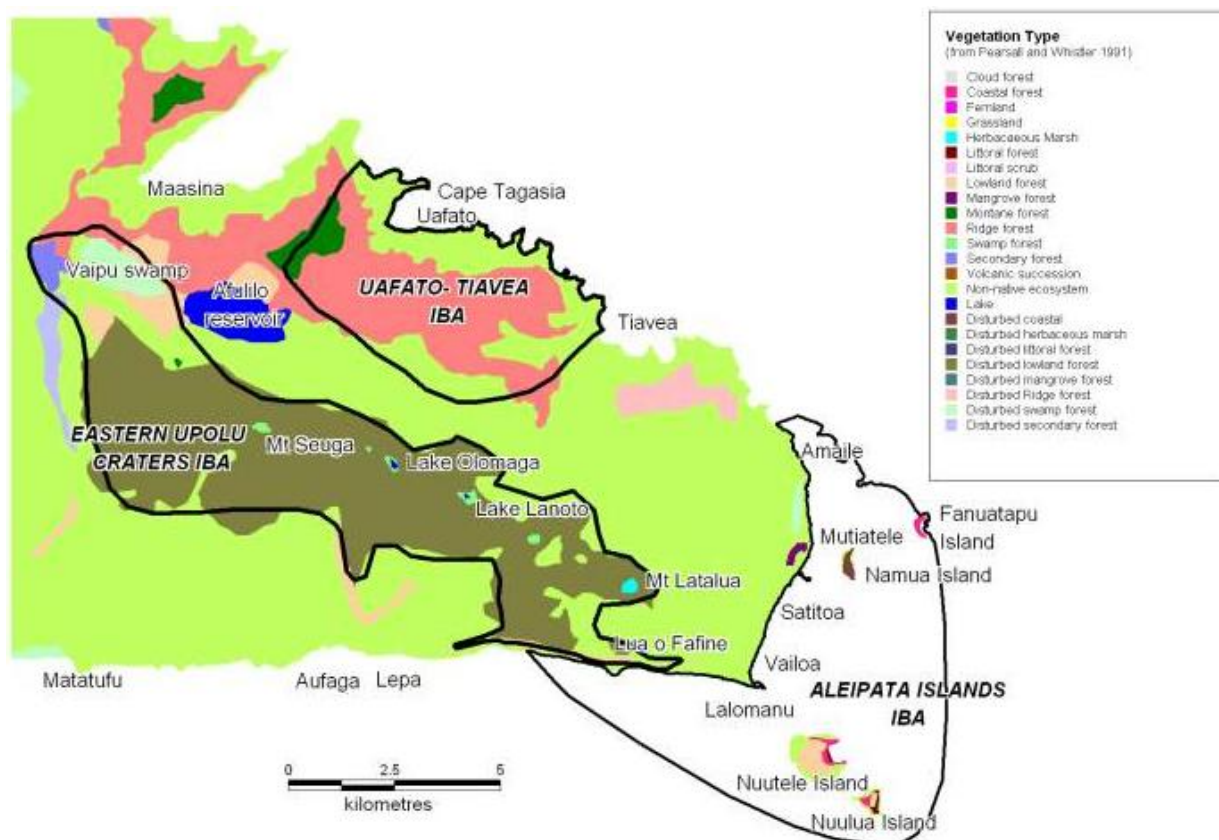
Area: 4759. (Ha)

Altitude: 300– 545m

IBA Criteria: A1 A2

Status: Customary Ownership

Site holds 5 of 8 globally, or near-threatened and 16 of the 20 restricted-range species of the Samoan Islands EBA



Summary

This IBA covers the inland craters of Atua district on the east of Upolu. The IBA also includes within it the Afulilo Reservoir which was once the highest priority site for conservation in Samoa but was later cleared for the hydro- electric dam. The IBA holds the highest densities of pigeons and doves on Upolu Island along with the presence of trigger bird species

Site Description

The IBA site stretches from the Aleipata district where craters of Lanomoa and Luaofafine are located to the inland craters next to the Afulilo HEP dam and include the upland mixed swamp forests of Vaipu. The altitude of above 300m to close to 600m means the vegetation crosses from lowland rainforest to montane forest. Other ecosystems of note in the IBA include crater lakes, mixed upland swamp forest and the Mulivaifagatoloa watershed. This makes the site the most diverse in terms of vegetation types, which could also provide some explanation about the area having recorded the highest density of pigeons and doves in Samoa. The site apart from areas cleared for farming and the dam is severely

damaged from cyclone damage that is now mostly dominated by palms along the crater ridges. Inside some of the craters are wetlands home to waterfowl species and vagrants. The disturbed forest is dominated by the *Merremia* spp along the ridges and inside the craters,. The IBAs key threats are land clearing for livestock farming, agriculture development and the potential expansion of the hydro-dam into Vaipu Swamp. The soil is a combination of Fagaloa volcanic soil and the upland swamps.

Most of the site in under customary ownership belonging to 4 different districts of Lotofaga, Lepa, Aleipata and Fagaloa.

Birds

The site has been surveyed in at least three major ecological surveys, which all identified the high densities of pigeons and doves, including the globally threatened tooth-billed pigeon. A recent survey for the IBA further confirmed the presence of at least 8 tooth-billed pigeons in around the Vaipu swamp, and another 3 recorded along the ridges of the lower down Mulivaifagatoloa watershed. Mao was also recorded from the site by only 2 were confirmed as well as two recordings of the Shy Ground dove. Other trigger species present in good numbers compared to other sites include Samoan Flycatcher *Myiagra albiventris* and the Samoan Triller (*Lalage sharpei*)

| Common name | Scientific name | A1 | A2 (203) | References |
|--------------------------|-----------------------------------|----|----------|---|
| Shy Ground-dove | <i>Gallicolumba stairi</i> | X | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Many-coloured Fruit-dove | <i>Ptilinopus perousi</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Tooth-billed Pigeon | <i>Didunculus strigirostris</i> | X | X | Lovegrove 92, Hay 91, Schuster 96, 09, Beichle 06 |
| Purple-capped Fruit-dove | <i>Ptilinopus porphyraceus</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Blue-crowned Lorikeet | <i>Vini australis</i> | | X | Lovegrove 92, Hay 91, Schuster 96,09 |
| Flat-billed kingfisher | <i>Todiramphus recurvirostris</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Wattled honeyeater | <i>Foulehaio carunculatus</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Mao | <i>Gymnomyza samoensis</i> | X | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Polynesian Triller | <i>Lalage maculosa</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Samoan Triller | <i>Lalage Sharpie</i> | X | X | Schuster 96, Schuster 09 |
| Samoan Flycatcher | <i>Myiagra albiventris</i> | X | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Samoan whistler | <i>Pachycephala flavifrons</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Samoan Fantail | <i>Rhipidura nebulosa</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Samoan Starling | <i>Aplonis atrifusca</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Polynesian Starling | <i>Aplonis tabuensis</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Red-headed Parrotfinch | <i>Erythrura cyaneovirens</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |

Other Biodiversity

The site, although disturbed in areas closer to the main road and along the ridges where cyclone damage is evident, contains a variety of vegetation types that makes it a unique site for Samoa. The mixed upland swamp forests of Vaipu and Punataemoo are amongst the highest priority sites for conservation as identified in the Ecosystem Mapping Study (Pearsall and Whistler 1991, Parks, et al 1992). The site is also home to other IUCN red-listed species such as *Pteropus samoenses* (Samoa fruit bat) and the native *Clinostigma samoense* (niu vao)

Conservation

The IBA site is threatened by land clearing and expansion of hydro electric dam along with natural threats of cyclones. No conservation program is planned for this site despite Vaipu Swamp being recommended in previous ecological surveys of Samoa to be important for conservation.

References

- Atherton, J. 2004. *Comparison of 1999 forest cover with previous forest covers maps*. Extract from GIS Design and Development 3rd Mission Final Report for FAO, December , 2004, Apia, Samoa.
- Atherton, J and Tipamaa, T; 2009, Review of Status of Knowledge of Samoan Avifauna,
- ,U. 1997. *Report on the Conservation Area at Uafato – Studies on the Avifauna*, SPREP, Apia; Samoa.
- Beichle, U. 1991. Status and acoustical demarcation of pigeons of Western Samoa. *Notornis* 38(1): 81-86.
- Beichle, U. 2006. *Saving Samoa's Critically Endangered Maomao and Manumea*. Unpublished final report to Wildlife Conservation Society, June 2006, 20pp
- Bellingham, M. and Davis, A. 1988. Forest bird communities in Western Samoa. *Notornis* 35: 117-1 28
- Birdlife International. 2000. *Threatened Birds of the World*, Lynx Editions and Birdlife International, Barcelona, Spain & Cambridge, U.K.
- Birdlife International. 2009
<http://www.birdlife.org/datazone/ebas/index.htm?action=EbaHTMLDetails.asp&sid=202&m=0>
- Clarkson, B.D., Dugdale, J.S., Whistler, W.A., Butler, D., Schuster, C., Robinson, T. 1995. *Technical Report on the Pilot Study of the Upland Ecosystems of Western Samoa*. Landcare Research, Wellington, New Zealand.
- Dhondt, A.1976. Bird Observations in Western Samoa. *Notornis* 23: 29-43.
- Government of Samoa. 2001. *Samoa's Biodiversity Strategy and Action Plan. Keep the Remainder of the Basket*. Government of Samoa, Apia.
- Holloway, C.W., Floyd, C.H. 1975. *A National Parks System for Western Samoa*. United Nations Development Advisory Team for the South Pacific.
- Lovegrove, T., Bell, B. and Hay, R. 1992. *The indigenous Wildlife of Western Samoa: The Impacts of Cyclone Val and a Recovery and Management Strategy*. NZ Ministry of Conservation
- Merlin, M. D. and Juvik, J. O. 1985. Bird Protection in Western Samoa. *Oryx: Journal of the Flora and Fauna Society Vol 19:97-103*.
- Mittermeier, J. 2006. Searching for Samoa's Mysterious Moorhen. *Yale Environmental News*. Spring

2006, Vol 11. no 2: 19-20

MNRE, 2006a. *Recovery Plan for the Manumea or Tooth-billed Pigeon (Didunculus strigirostris)*. Ministry of Natural Resources and Environment, Government of Samoa, Apia, Samoa.

MNRE, 2006b. *Recovery Plan for the Ma'oma'o or Mao (Gymnomyza samoensis)*. . Ministry of Natural Resources and Environment, Government of Samoa, Apia, Samoa.

Ogle, C.C. 2001. Exotic plants of the Aleipata Islands, Samoa. *Institute of Applied Sciences Technical Report No. 200 1/08*. The University of the South Pacific, Suva, Fiji.

Ollier, C.D., Whistler, W.A. and Amerson, A.B. 1979. *O le Pupu Pu'e National Park*. United Nations Development Advisory Team for the Pacific, Suva, Fiji.

Park, G., Hay, J., Whistler, W.A., Lovegrove, T and Ryan, P. 1992. *The National ecological Survey of Western Samoa: the conservation of biological diversity in the coastal lowland of Western Samoa*. New Zealand Department of Conservation.

Pearsall, S. H. and Whistler, W. A. 1991. *Terrestrial ecosystem mapping for Western Samoa*. Report to the Government of Samoa by South Pacific Regional Environment Programme and East-west center, Environment and Policy Institute, Honolulu, US. 72pp

Schuster, C., Whistler, W.A. and Tuiailemafua, S. 1997. *The Conservation of Biological Diversity in Upland Ecosystems of Samoa*, New Zealand Ministry of Foreign Affairs and Trade.

Taulealo, T. I. 1993. *Western Samoa State of the Environment Report*. SPREP, Apia; Samoa

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

Tipama'a, T. and Beichle U., 2006. *RNHP Manumea Maomao Bird Survey Data*, in draft, (personal communications)

Tipama'a, T., 2001. *Preliminary Status Report on Bird Counts on Selected Monitoring Sites On Upolu & Savaii*, Unpublished final report . June 2001. 7pp

Watling, D. 2001. *A Guide to the Birds of Fiji and Western Polynesia including American Samoa, Niue, Samoa, Tokelau, Tonga, Tuvalu and Wallis & Futuna*. Suva, Fiji, Environment Consultants (Fiji) Ltd

WS03 UAFATO-TIAVEA FOREST

Coordinates: -171.5112°; -13.9628°

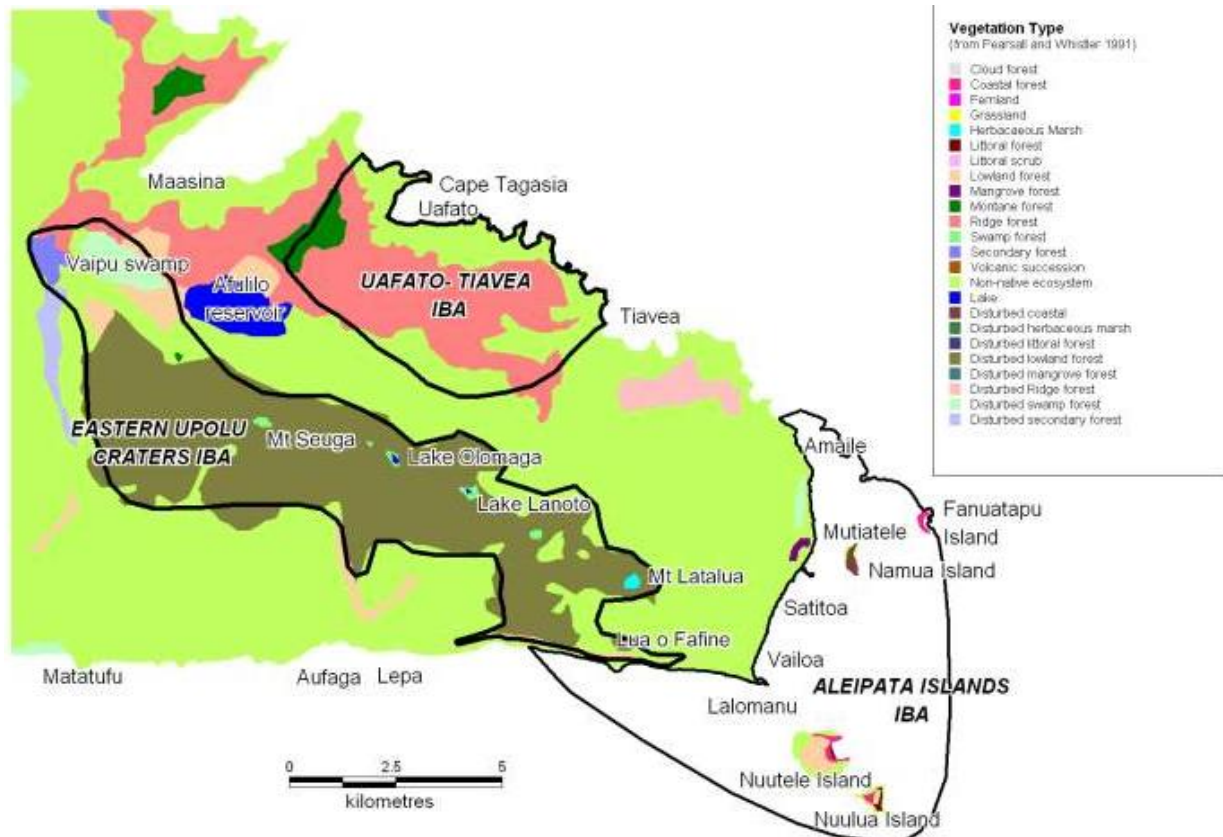
Area: 2330 (Ha)

Altitude: 0-740m

Status: Uafato Conservation Area:

IBA Criteria: A1 A2

Site holds 4 of the 8 globally, or near-threatened and 15 of the 20 restricted-range species of the Samoan Islands EBA



Summary

This IBA covers high priority forest conservation site on the north west of Upolu Island. The lowland forest was identified in the Samoa NBSAP as a high priority for forest conservation due to its pristine lowland forest and the high density and richness in plants and avifauna. All the globally threatened and birds of national concern are found apart from the Samoan moorhen and the Samoan White-eye.

Site Description

The IBA is located in the oldest soil type in Samoa, the Fagaloa volcanic. The soil is mostly clay and alluvial with steep ridges from long weathering process. The vegetation consists of littoral rainforest all the way into montane forest. The steep ridges along the IBA restricted the forest clearing in the area leaving it in pristine state apart from damage caused by the cyclones. Uafato village customary land was part of a Community-based conservation area program under the South Pacific Biodiversity Program in the 1990's that was managed by O Le Siosiomaga Society. Since the completion of the SPBCP, the village of Uafato continued to maintain the area as a conservation area.

The IBA site has been extensively surveyed since 1991 when it was recognized as one of the priority sites for the conservation of lowland forests in Samoa. From the surveys, the significance of the site was further enhanced with the presence of globally threatened birds such as Tooth-billed Pigeon; Mao; the Samoan Flycatcher and Samoan Triller in low elevations. IT is the only site in all of Samoa that the Mao, Tooth-billed pigeon and Samoan Triller were found along the coastal ridges. The populations and densities were not as high as other larger sites but the relatively undisturbed condition of the coastal forests in the area ensured the presence of the birds in the site.

| Common name | Scientific name | A1 | A2 (203) | References |
|--------------------------|-----------------------------------|----|----------|---|
| Many coloured fruit dove | <i>Ptilinopus perousi</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Tooth-billed Pigeon | <i>Didunculus strigirostris</i> | X | X | Lovegrove 92, Hay 91, Schuster 96, 09, Beichle 06 |
| Purple capped fruit dove | <i>Ptilinopus porphyraceus</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Blue crowned Lorikeet | <i>Vini australis</i> | | X | Lovegrove 92, Hay 91, Schuster 96,09 |
| Flat-billed kingfisher | <i>Todiramphus recurvirostris</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Wattled honeyeaster | <i>Foulehaio carunculatus</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Mao | <i>Gymnomyza samoensis</i> | X | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Polynesian Triller | <i>Lalage maculosa</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Samoan Triller | <i>Lalage Sharpie</i> | X | X | Schuster 96, Schuster 09 |
| Samoan Flycatcher | <i>Myiagra albiventris</i> | X | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Samoan whistler | <i>Pachycephala flavifrons</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Samoan Fantail | <i>Rhipidura nebulosa</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Samoan Starling | <i>Aplonis atrifusca</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Polynesian Starling | <i>Aplonis tabuensis</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Red-headed Parrotfinch | <i>Erythrura cyaneovirens</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |

Other Biodiversity

The Uafato/Tiavea IBA recorded in high densities of globally threatened birds, richness and high species diversity with a relatively pristine state of the threatened coastal lowland rainforest. The site is also home to good populations of other IUCN redlisted species such as *Pteropus samoensis* (Samoa fruit bat) and *Intsia bijuga* (ifilele) a native hardwood species of concern.

Conservation

Part of the IBA site is under the Uafato Conservation Area and currently managed by the village of Uafato. A management plan was designed to manage the long term harvesting of *Intsia Bijuga* (ifilele) the local hardwood that was once prevalent in lowlands of Samoa but is threatened due to commercial logging and wood carvings.

References

Atherton, J, 2008, Database of bird recordings in Samoa

- Atherton, J and Tipamaa, T; 2009, Review of Status of Knowledge of Samoan Avifauna,
- Beichle, U. 1991. Status and acoustical demarcation of pigeons of Western Samoa. *Notornis* 38(1): 81-86.
- Beichle, U. 2006. *Saving Samoa's Critically Endangered Maomao and Manumea*. Unpublished final report to Wildlife Conservation Society, June 2006, 20pp
- Clarkson, B.D., Dugdale, J.S., Whistler, W.A., Butler, D., Schuster, C., Robinson, T. 1995. *Technical Report on the Pilot Study of the Upland Ecosystems of Western Samoa*. Landcare Research, Wellington, New Zealand.
- Dhondt, A.1976. Bird Observations in Western Samoa. *Notornis* 23: 29-43.
- Government of Samoa. 2001. *Samoa's Biodiversity Strategy and Action Plan. Keep the Remainder of the Basket*. Government of Samoa, Apia.
- Holloway, C.W., Floyd, C.H. 1975. *A National Parks System for Western Samoa*. United Nations Development Advisory Team for the South Pacific.
- Lovegrove, T., Bell, B. and Hay, R. 1992. *The indigenous Wildlife of Western Samoa: The Impacts of Cyclone Val and a Recovery and Management Strategy*. NZ Ministry of Conservation
- Mittermeier, J. 2006. Searching for Samoa's Mysterious Moorhen. *Yale Environmental News*. Spring 2006, Vol 11. no 2: 19-20
- MNRE, 2006a. *Recovery Plan for the Manumea or Tooth-billed Pigeon (Didunculus strigirostris)*. Ministry of Natural Resources and Environment, Government of Samoan, Apia, Samoa.
- MNRE, 2006b. *Recovery Plan for the Ma'oma'o or Mao (Gymnomyza samoensis)*. . Ministry of Natural Resources and Environment, Government of Samoan, Apia, Samoa.
- Ollier, C.D., Whistler, W.A. and Amerson, A.B. 1979. *O le Pupu Pu'e National Park*. United Nations Development Advisory Team for the Pacific, Suva, Fiji.
- Parrish, R., Stringer, I and Lester, P. 2004. Fauna survey of the Aleipata Islands, Samoa. 3rd Progress Report. *Institute of Applied Sciences Technical Report No. 2004/05*. Institute of Applied Sciences, the University of the South Pacific, Fiji.
- Park, G., Hay, J., Whistler, W.A., Lovegrove, T and Ryan, P. 1992. *The National ecological Survey of Western Samoa: the conservation of biological diversity in the coastal lowland of Western Samoa*. New Zealand Department of Conservation.
- Schuster, C., Whistler, W.A. and Tuiailemafua, S. 1997. *The Conservation of Biological Diversity in Upland Ecosystems of Samoa*, New Zealand Ministry of Foreign Affairs and Trade.
- Taulealo, T. I. 1993. *Western Samoa State of the Environment Report*. SPREP, Apia; Samoa
- Tipama'a, T. and Beichle U., 2006. *RNHP Manumea Maomao Bird Survey Data*, in draft, (personal communications)
- Tipama'a, T., 2001. Preliminary Status Report on Bird Counts on Selected Monitoring Sites On Upolu & Savaii, *Unpublished final report* . June 2001. 7pp

WS 04 O LE PUPU-PU'E NATIONAL PARK

Coordinates: -171.7277°; -13.9845°

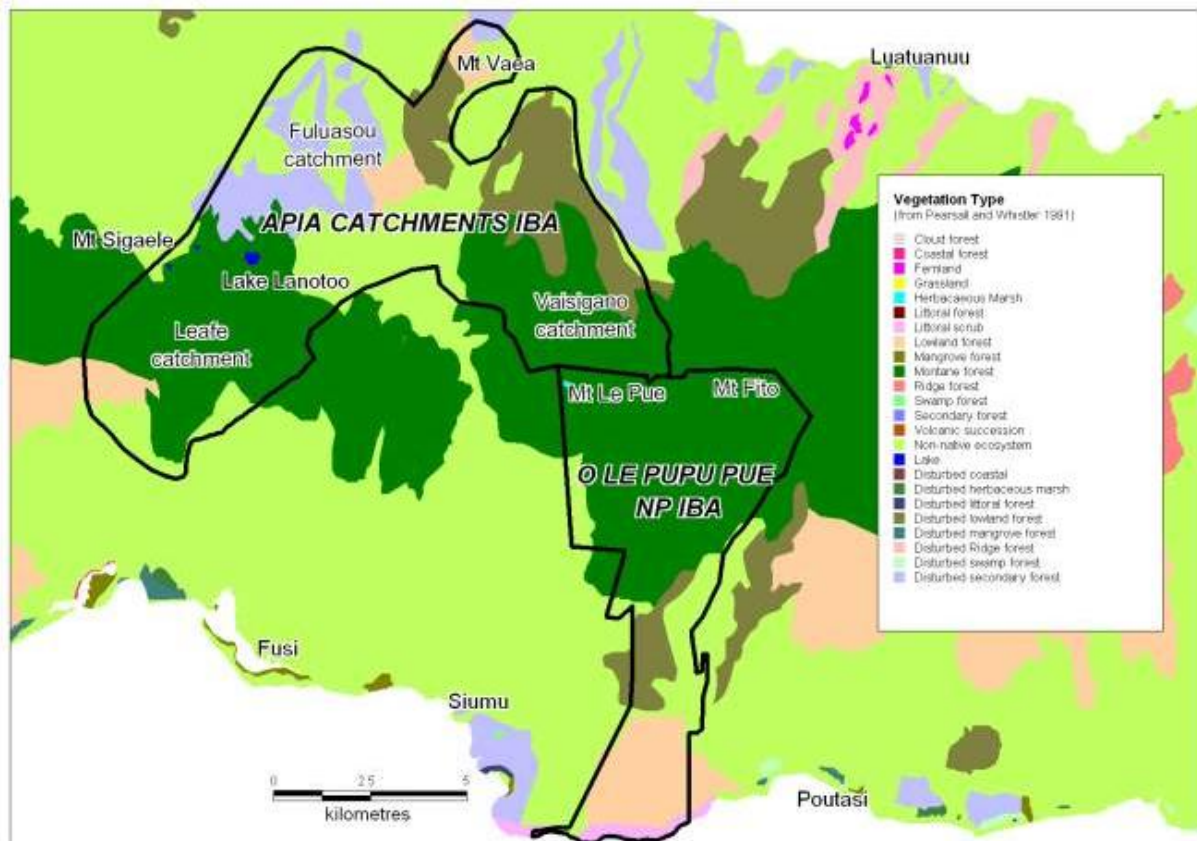
Area: 4228. (Ha)

Altitude: 0-1158m

Status: National Park;

IBA Criteria: A1; A2

Site holds 4 of the 8 globally threatened and 15 of the 20 restricted-range species of the Samoan Islands EBA



Summary

This IBA was the first national park established in the South Pacific. All the globally threatened birds except the Samoan white eye and the presumed to be extinct Samoan moorhen are present in the site. The protection of the area as a National Park continues to provide the necessary protection for the threatened bird species and the critical habitats needed for their survival.

Site Description

The OLPP National Park is located on the south coast of Upolu and extends from the coast all the way to the interior of Upolu. The site therefore has the full range of ecosystems from the littoral forests on the rugged coastal ridges, to the lowland rainforest, extending to the ridge rainforests along the watershed area to the montane forests. The majority of the site is made up of the Lefaga volcanic rock which has not fully weathered, thus making the soil very infertile.

Although the site has never been logged or cleared for any development, the impacts of the 1990 and 1991 cyclones are evident with a lot of the lowland forests now mixed with secondary growth after

trees were destroyed by the cyclones. The presence of native vegetation and natural regeneration provide habitat and food supply for the birds in the area.

OLNPP National Park is currently managed by the Forestry Division of the MNRE which is currently working with JICA to upgrade the facilities and management of the site.

Birds

The site is the most surveyed area of all IBA sites in Samoa, mainly due to its status as a National Park. IT was also firstly surveyed in 1972 during the identification of potential locations for a National Park. Based on the recorded information and surveys 4 of the 8 globally threatened bird species of Samoa are present as well an additional 11 restricted range species. Like all the IBA sites for Samoa, actual populations for birds could not be determine due to the lack of time and information available.

| Common name | Scientific name | A1 | A2 (203) | References |
|--------------------------|-----------------------------------|----|----------|---|
| Many coloured fruit dove | <i>Ptilinopus perousi</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Tooth-billed Pigeon | <i>Didunculus strigirostris</i> | X | X | Lovegrove 92, Hay 91, Schuster 96, 09, Beichle 06 |
| Purple capped fruit dove | <i>Ptilinopus porphyraceus</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Blue crowned Lorikeet | <i>Vini australis</i> | | X | Lovegrove 92, Hay 91, Schuster 96,09 |
| Flat-billed kingfisher | <i>Todiramphus recurvirostris</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Wattled honeyeaster | <i>Foulehaio carunculatus</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Mao | <i>Gymnomyza samoensis</i> | X | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Polynesian Triller | <i>Lalage maculosa</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Samoa Triller | <i>Lalage Sharpie</i> | X | X | Schuster 96, Schuster 09 |
| Samoa Flycatcher | <i>Myiagra albiventris</i> | X | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Samoa whistler | <i>Pachycephala flavifrons</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Samoa Fantail | <i>Rhipidura nebulosa</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Samoa Starling | <i>Aplonis atrifusca</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Polynesian Starling | <i>Aplonis tabuensis</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Red-headed Parrotfinch | <i>Erythrura cyaneovirens</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |

Other Biodiversity

OLPP National Park provides the unique opportunity for conservation in Samoa in that it is the only site that extends from the cost all the way into the interior of the island, thus providing a wide range for the birds to move around and disburse seeds as pollinators. The IUCN Red Listed *Pteropus samoenses* (Samoa fruit bat) and *Clinostigma samoense* (niu vao) *Thaumatodon hystricelloides* have been identified.

Conservation

The OLPP National Park work continues with a JICA funded program being implemented recently. The National Park status provides general protection for the site although it has been reported that hunters have been seen within the site.

References

- Atherton, J, 2008, Database of bird recordings in Samoa
- Atherton, J and Tipamaa, T; 2009, Review of Status of Knowledge of Samoan Avifauna,
- Beichle, U. 1991. Status and acoustical demarcation of pigeons of Western Samoa. *Notornis* 38(1): 81-86.
- Beichle, U. 2006. *Saving Samoa's Critically Endangered Maomao and Manumea*. Unpublished final report to Wildlife Conservation Society, June 2006, 20pp
- Clarkson, B.D., Dugdale, J.S., Whistler, W.A., Butler, D., Schuster, C., Robinson, T. 1995. *Technical Report on the Pilot Study of the Upland Ecosystems of Western Samoa*. Landcare Research, Wellington, New Zealand.
- Dhondt, A.1976. Bird Observations in Western Samoa. *Notornis* 23: 29-43.
- Government of Samoa. 2001. *Samoa's Biodiversity Strategy and Action Plan. Keep the Remainder of the Basket*. Government of Samoa, Apia.
- Holloway, C.W., Floyd, C.H. 1975. *A National Parks System for Western Samoa*. United Nations Development Advisory Team for the South Pacific.
- Lovegrove, T., Bell, B. and Hay, R. 1992. *The indigenous Wildlife of Western Samoa: The Impacts of Cyclone Val and a Recovery and Management Strategy*. NZ Ministry of Conservation
- Mittermeier, J. 2006. Searching for Samoa's Mysterious Moorhen. *Yale Environmental News*. Spring 2006, Vol 11. no 2: 19-20
- MNRE, 2006a. *Recovery Plan for the Manumea or Tooth-billed Pigeon (Didunculus strigirostris)*. Ministry of Natural Resources and Environment, Government of Samoa, Apia, Samoa.
- MNRE, 2006b. *Recovery Plan for the Ma'oma'o or Mao (Gymnomyza samoensis)*. . Ministry of Natural Resources and Environment, Government of Samoa, Apia, Samoa.
- Ollier, C.D., Whistler, W.A. and Amerson, A.B. 1979. *O le Pupu Pu'e National Park*. United Nations Development Advisory Team for the Pacific, Suva, Fiji.
- Parrish, R., Stringer, I and Lester, P. 2004. Fauna survey of the Aleipata Islands, Samoa. 3rd Progress Report. *Institute of Applied Sciences Technical Report No. 2004/05*. Institute of Applied Sciences, the University of the South Pacific, Fiji.
- Park, G., Hay, J., Whistler, W.A., Lovegrove, T and Ryan, P. 1992. *The National ecological Survey of Western Samoa: the conservation of biological diversity in the coastal lowland of Western Samoa*. New Zealand Department of Conservation.
- Schuster, C., Whistler, W.A. and Tuiailemafua, S. 1997. *The Conservation of Biological Diversity in Upland Ecosystems of Samoa*, New Zealand Ministry of Foreign Affairs and Trade.
- Taulealo, T. I. 1993. *Western Samoa State of the Environment Report*. SPREP, Apia; Samoa

Tipama'a, T. and Beichle U., 2006. *RNHP Manumea Maomao Bird Survey Data*, in draft, (personal communications)

Tipama'a, T., 2001. *Preliminary Status Report on Bird Counts on Selected Monitoring Sites On Upolu & Savaii*, Unpublished final report . June 2001. 7pp

WS 05 APIA CATCHMENTS

Coordinates: 171.7577°; -13.8930°; -

Area: 8268.30 (Ha)

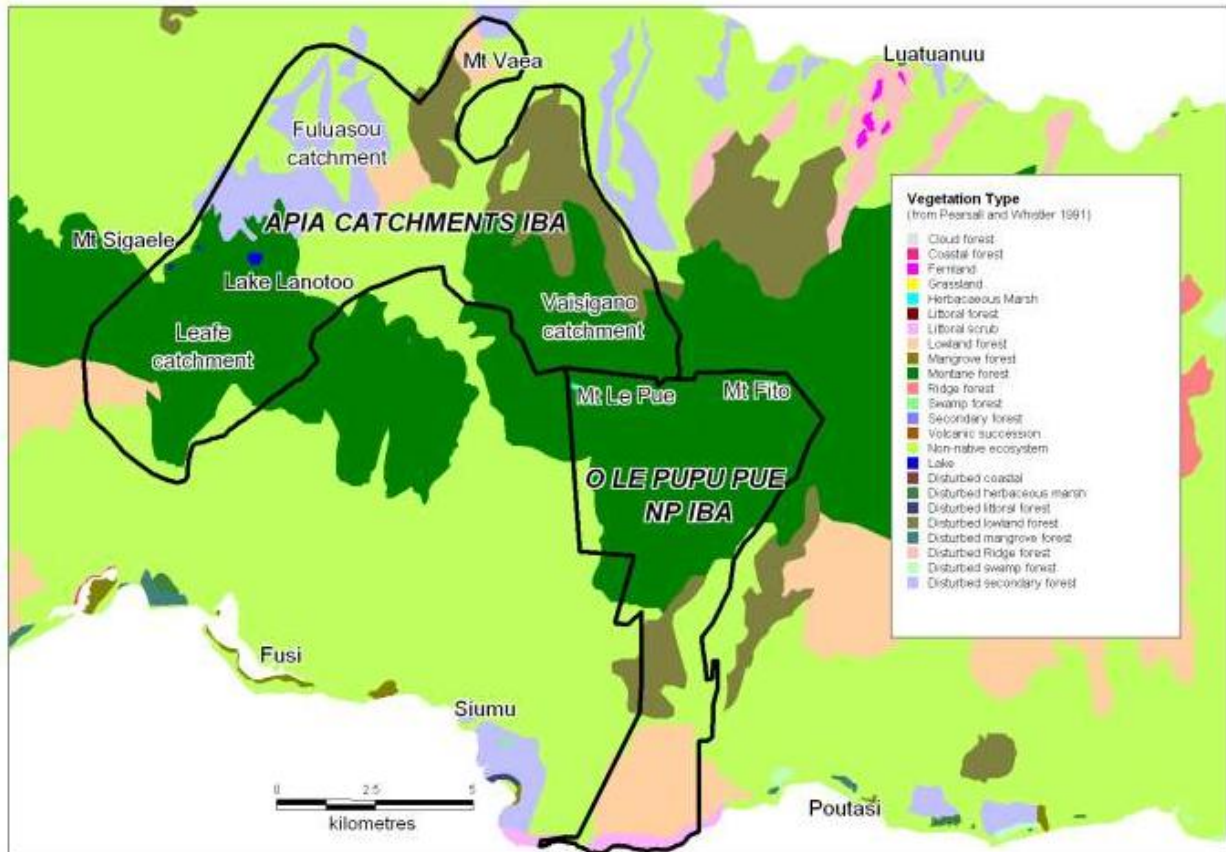
Altitude: 160-1120m

Status: Watershed Protection Reserve;

National Park: Nature Reserve

IBA Criteria: A1; A2:

Site holds 4 of the 8 globally threatened and 16 of the 20 restricted-range species of the Samoan Islands EBA



Summary

This IBA covers Vaisigano watershed, Leafe Watershed, and Fuluasou Watershed, Lake Lanotoo National Park and Mt Vaea Reserve within the central highlands of Upolu. The IBA is the closest to Apia the capital of Samoa. The vegetation of the site is predominantly disturbed forest both in the lowland and montane areas.

Site Description

The IBA encompasses all the watershed areas of Leafe Catchment on the west, Vaisigano on the east and Fuluasou in the centre of Upolu island. Further included in this IBA is the Lake Lanotoo National Park and the MT Vaea Nature Reserve. The IBA consists of a mixture of lowland rainforest along the ridges of the watershed areas and Mt Vaea Reserve, secondary forest dominated by *Albizia* spp closer to settlements and disturbed montane forest in higher elevation. This is of significance because of its close proximity to Apia, the capital Samoa and the densely populated area of the country. Although the site is predominantly secondary and disturbed forest, its importance as watershed area provides protection

for native biodiversity including birds. Moreover, having it as an IBA will provide extra protection of birds as seed dispersers and pollinators which would be useful for the regeneration of the native forest.

Four of the globally, or near-threatened birds of Samoa are present in this IBA despite its closeness to human settlements. Although there is a dominance of invasive species such as *Funtumia elastica* and *Albizia* spp in certain areas of the forest, its designation as an IBA is due to the presence of globally threatened species and other trigger bird species.. Furthermore, the changes in the forest structure are not man-made but the result of the cyclones and the seed dispersal nature of the invasive *Funtumia elastica* and *Albizia* spp. The O Le Pupu-National Park and Mt Vaea Nature reserve have served as important areas close to town for viewing Samoa’s native flora and fauna.

Birds

Certain areas of the IBA such as the Mt Vaea Nature Reserve, Lake Lanutoo National Park and Vaisigano Watershed area have been well surveyed by different groups. From these surveys, populations ranging in the 20s to 30s of the globally threatened Tooth-billed Pigeon and Mao have been recorded. Other trigger species such as the Samoan Flycatcher, Samoan Triller, Many coloured fruit dove and Polynesian Starling were also recorded in good densities. Population densities for the Red-headed Parrotfinch were the highest in this site during the IBA field survey.

| Common name | Scientific name | A1 | A2 (203) | References |
|--------------------------|-----------------------------------|----|----------|---|
| Many coloured fruit dove | <i>Ptilinopus perousi</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Tooth-billed Pigeon | <i>Didunculus strigirostris</i> | X | X | Lovegrove 92, Hay 91, Schuster 96, 09, Beichle 06 |
| Purple capped fruit dove | <i>Ptilinopus porphyraceus</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Blue crowned Lorikeet | <i>Vini australis</i> | | X | Lovegrove 92, Hay 91, Schuster 96,09 |
| Flat-billed kingfisher | <i>Todiramphus recurvirostris</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Wattled honeyeaster | <i>Foulehaio carunculatus</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Mao | <i>Gymnomyza samoensis</i> | X | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Cardinal Myzomela | <i>Mysomela cardinalis</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Polynesian Triller | <i>Lalage maculosa</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Samoan Triller | <i>Lalage Sharpie</i> | X | X | Schuster 96, Schuster 09 |
| Samoan Flycatcher | <i>Myiagra albiventris</i> | X | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Samoan whistler | <i>Pachycephala flavifrons</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Samoan Fantail | <i>Rhipidura nebulosa</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Samoan Starling | <i>Aplonis atrifusca</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Polynesian Starling | <i>Aplonis tabuensis</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |
| Red-headed Parrotfinch | <i>Erythrura cyaneovirens</i> | | X | Lovegrove 92, Hay 91, Schuster 96, 09 |

Other Biodiversity

The threatened lowland ecosystems surrounding the main watersheds and the Mt Vaea Nature reserve are significant for the conservation of native biodiversity in Samoa. From the biological surveys of the site, around 30% of the native flora of Samoa (Parks 92) is present in the IBA site.

The site is also home to other IUCN redlisted species such as *Thaumatodon hystricelloides* (land snail), *Pteropus samoenses* (Samoa fruit bat) and *Pteropus tonganus* roost of over 800 individuals and *Clinostigma samoensis* (niu vao)

Conservation

The IBA covers the Lake Lanutoo National Park, Mt Vaea Nature Reserve which are under Government Land, and the Apia Catchments of Vaisigano, Leafe and Fuluasou which will be protected under the Watershed Regulation. The main threats to the area are from small scale land clearing for plantations, cyclones and human settlement pressures.

References

Atherton, J. 2008. Database on Birds of Samoa recordings

Atherton, J. 2004. Comparison of 1999 forest cover with previous forest covers maps. Extract from GIS Design and Development 3rd Mission Final Report for FAO, December, 2004, Apia, Samoa.

Atherton, J and Tipamaa, T; 2009, Review of Status of Knowledge of Samoan Avifauna,

Beichle, U. 1991. Status and acoustical demarcation of pigeons of Western Samoa. *Notornis* 38(1): 81-86.

Beichle, U. 2006. Saving Samoa's Critically Endangered Maomao and Manumea. Unpublished final report to Wildlife Conservation Society, June 2006, 20pp

Birdlife International. 2000. Threatened Birds of the World, Lynx Editions and Birdlife International, Barcelona, Spain & Cambridge, U.K.

Birdlife International. 2009

<http://www.birdlife.org/datazone/ebas/index.htm> I?action=EbaHTMLDetails.asp&sid=202&m=0

Clarkson, B.D., Dugdale, J.S., Whistler, W.A., Butler, D., Schuster, C., Robinson, T. 1995. Technical Report on the Pilot Study of the Upland Ecosystems of Western Samoa. Landcare Research, Wellington, New Zealand.

Dhondt, A. 1976. Bird Observations in Western Samoa. *Notornis* 23: 29-43.

Government of Samoa. 2001. Samoa's Biodiversity Strategy and Action Plan. Keep the Remainder of the Basket. Government of Samoa, Apia.

Holloway, C.W., Floyd, C.H. 1975. A National Parks System for Western Samoa. United Nations Development Advisory Team for the South Pacific.

- Lovegrove, T., Bell, B. and Hay, R. 1992. The indigenous Wildlife of Western Samoa: The Impacts of Cyclone Val and a Recovery and Management Strategy. NZ Ministry of Conservation
- MNRE, 1996. Post Cyclone Bird Monitoring Program, unpublished
- MNRE, 2006a. Recovery Plan for the Manumea or Tooth-billed Pigeon (*Didunculus strigirostris*). Ministry of Natural Resources and Environment, Government of Samoa, Apia, Samoa.
- MNRE, 2006b. Recovery Plan for the Ma'oma'o or Mao (*Gymnomyza samoensis*). . Ministry of Natural Resources and Environment, Government of Samoa, Apia, Samoa.
- Ollier, C.D., Whistler, W.A. and Amerson, A.B. 1979. O le Pupu Pu'e National Park. United Nations Development Advisory Team for the Pacific, Suva, Fiji.
- Park, G., Hay, J., Whistler, W.A., Lovegrove, T and Ryan, P. 1992. The National ecological Survey of Western Samoa: the conservation of biological diversity in the coastal lowland of Western Samoa. New Zealand Department of Conservation.
- Pearsall, S. H. and Whistler, W. A. 1991. Terrestrial ecosystem mapping for Western Samoa. Report to the Government of Samoa by South Pacific Regional Environment Programme and East-west center, Environment and Policy Institute, Honolulu, US. 72pp
- Schuster, C., Whistler, W.A. and Tuiailemafua, S. 1997. The Conservation of Biological Diversity in Upland Ecosystems of Samoa, New Zealand Ministry of Foreign Affairs and Trade.
- Taulealo, T. I. 1993. Western Samoa State of the Environment Report. SPREP, Apia; Samoa
- Tarburton, M. K. 2001. Observations on the status of the land birds, wading birds and seabirds of Samoa. *Emu* 101:349 – 360.
- Tipama'a, T. and Beichle U., 2006. RNHP Manumea Maomao Bird Survey Data, in draft, (personal communications)
- Tipama'a, T., 2001. Preliminary Status Report on Bird Counts on Selected Monitoring Sites On Upolu & Savaii, Unpublished final report . June 2001. 7pp

WS 06 CENTRAL SAVAII RAINFOREST

Coordinates: -172.4165°; -13.6129°

Area: 72,699 (Ha)

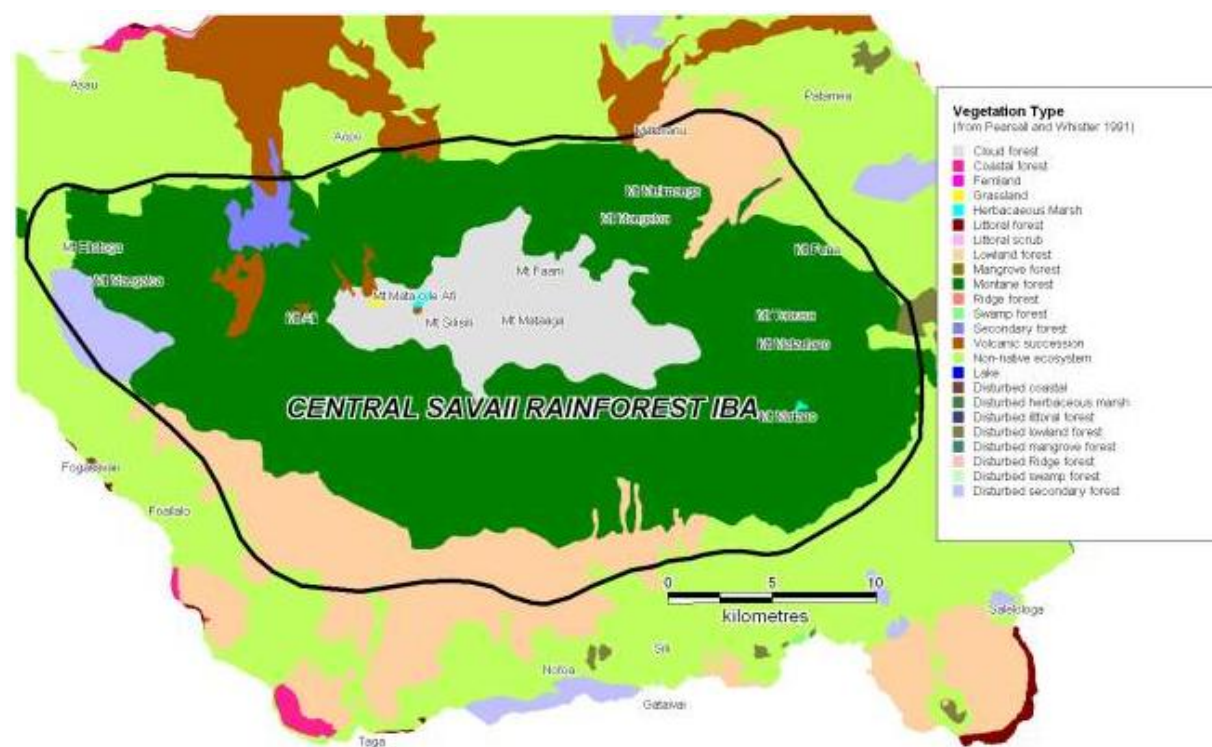
Altitude: 500-1800m

Status: Proposed Protected Area

Land Tenure: Customary Lands Belonging To Several Communities

IBA Criteria: A1 (Globally Threatened Birds): A2: (Restricted Range Birds)

Site holds 6 or 7 of the 8 globally threatened species and 18 or 19 of the 20 restricted-range species of the Samoan Islands EBA



Summary

Central Savaii IBA is the largest IBA in Samoa and home to the largest diversity and population of birds in the country. All the land birds of Samoa have been recorded in the site in recent years apart from the Samoan Moorhen which has not been recorded anywhere for over 90 years. The IBA provides the best opportunity for the conservation of birds and its habitats in Samoa because of its size and the terrain which makes it very difficult for human clearance or habitation.

Site Description

This IBA covers all the Savaii Uplands above approximately 500m elevation. The vegetation types present are montane rainforest and cloud forests for land above 700m which is dominated by *Dysoxylum huntii*, lowland and ridge rainforests dominated by *Pometia piñata* mixed in with disturbed lowland rainforests between 500-700m. Some volcanic ash and lava vegetation is found along the northern side from volcanic eruptions in the early 1900's. At the top of Mt Silisili is the only recorded montane bog in Samoa.

The IBA is home to the highest richness and diversity of plants and animals species found in Samoa (Parks, et. al 1992 and Schuster, et al 1997) as recorded in the 2 major ecological surveys of Samoa

where all the land birds of Samoa were recorded and over 50% of Samoa's recorded vascular plants are known to be found.

The majority of the site is indigenous rainforest with the only disturbance being from forest fires along the dry north western end and cyclones A few land clearing for plantations forest replanting program are the only human disturbances to the site.

Birds

The IBA designation for the site was based on the results of surveys undertaken by more than six different groups. All these surveys identified the presence of all the trigger species for Samoa apart from the Samoa Moorhen as being present and in above average densities compared to other sites in Samoa.

Due to the vastness of the area, only the northern part from Aopo village to the top of Mt Silisili, parts of the southern side from Salailua and Sili watershed area have been surveyed. Therefore actual bird populations cannot be determined, but from birds surveys records, all have recorded the populations of the globally significant Tooth-billed pigeon in numbers ranging from 5-20 while the Mao ranged from 5-10 during the surveys. Furthermore, it is the only site in Samoa that the Samoan white-eye has been recorded and populations of more than 100 recorded in one of the surveys. Other trigger bird species recorded in the IBA include Shy (Samoa Friendly) Ground Dove Samoan Flycatcher and Samoan Triller . The IBA is also the only site where the Samoa Moorhen's two possible sightings in 1987 were recorded in upland forest west of Mt Elietoga (Bellingham and Davis 1988) The last confirmed sighting was recorded in 1873. Consequently this species is often listed as extinct. If it still persists anywhere in Samoa it will be within this IBA.

| Common name | Scientific name | A1 | A2 (203) | References |
|--------------------------|-----------------------------------|----|----------|--|
| Samoa Moorhen | <i>Galinula pacifica</i> | X | X | |
| Shy Ground-dove | <i>Galicolumba stairi</i> | X | X | Lovegrove 92, Hay 91, Schuster 96, |
| Many coloured fruit dove | <i>Ptilinopus perousi</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Tooth-billed Pigeon | <i>Didunculus strigirostris</i> | X | X | Lovegrove 92, Hay 91, Schuster 96, , Beichle 06 |
| Purple capped fruit dove | <i>Ptilinopus porphyraceus</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Blue crowned Lorikeet | <i>Vini australis</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Flat-billed kingfisher | <i>Todiramphus recurvirostris</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Wattled honeyeater | <i>Foulehaio carunculatus</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Mao | <i>Gymnomyza samoensis</i> | X | X | Lovegrove 92, Hay 91, Schuster 96, |
| Cardinal Myzomela | <i>Mysomela cardinalis</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Polynesian Triller | <i>Lalage maculosa</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Samoa Triller | <i>Lalage Sharpie</i> | X | X | Lovegrove 92, Hay 91, Schuster 96, |
| Samoa Flycatcher | <i>Myiagra albiventris</i> | X | X | Lovegrove 92, Hay 91, Schuster 96, |
| Samoa whistler | <i>Pachycephala flavifrons</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Samoa whiteeye | <i>Zosterops samoensis</i> | X | X | Lovegrove 92, Hay 91, Schuster 96, |
| Samoa Fantail | <i>Rhipidura nebulosa</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Samoa Starling | <i>Aplonis atrifusca</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Polynesian Starling | <i>Aplonis tabuensis</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |
| Red-headed Parrotfinch | <i>Erythrura cyaneovirens</i> | | X | Lovegrove 92, Hay 91, Schuster 96, |

Other Biodiversity

A large part of the IBA has not been surveyed although several surveys to the highest peak of Mt Silisili were used in the Conservation of Upland Forest Ecosystems of Samoa survey of 1996 identified this site

as the priority site for conservation due to the presence of high densities of globally threatened birds, the relatively pristine state of the upland forests and limited invasive species. The IBA is the only recorded site for a montane bog in Samoa.

The site is also home to other IUCN red-listed species such as *Pteropus samoensis* (Samoan fruit bat) and *Drymophloeus samoensis* (niu vao)

Conservation

The IBA site is threatened by logging along the lower slopes where millable timber is found. The recent government policy directive stopping commercial logging operations could provide the necessary protection if it is not overturned in the future. The northwestern side of the IBA is often threatened by forest fires during the dry season each year and cyclones during the wet season.

The site is identified in all the major conservation related reports on Samoa as the highest priority for conservation. To date, several proposals have been developed to establish a conservation area for the whole area or in portions. Further plans are also being considered for the conservation of the Sili Watershed Area on the south east of Savaii.

References

- Atherton, J, 2008, Database of bird recordings in Samoa
- Atherton, J and Tipamaa, T; 2009, Review of Status of Knowledge of Samoan Avifauna,
- Beichle, U. 1991. Status and acoustical demarcation of pigeons of Western Samoa. *Notornis* 38(1): 81-86.
- Beichle, U. 2006. *Saving Samoa's Critically Endangered Maomao and Manumea*. Unpublished final report to Wildlife Conservation Society, June 2006, 20pp
- Clarkson, B.D., Dugdale, J.S., Whistler, W.A., Butler, D., Schuster, C., Robinson, T. 1995. *Technical Report on the Pilot Study of the Upland Ecosystems of Western Samoa*. Landcare Research, Wellington, New Zealand.
- Dhondt, A.1976. Bird Observations in Western Samoa. *Notornis* 23: 29-43.
- Government of Samoa. 2001. *Samoa's Biodiversity Strategy and Action Plan. Keep the Remainder of the Basket*. Government of Samoa, Apia.
- Holloway, C.W., Floyd, C.H. 1975. *A National Parks System for Western Samoa*. United Nations Development Advisory Team for the South Pacific.
- Lovegrove, T., Bell, B. and Hay, R. 1992. *The indigenous Wildlife of Western Samoa: The Impacts of Cyclone Val and a Recovery and Management Strategy*. NZ Ministry of Conservation
- Mittermeier, J. 2006. Searching for Samoa's Mysterious Moorhen. *Yale Environmental News*. Spring 2006, Vol 11. no 2: 19-20
- MNRE, 2006a. *Recovery Plan for the Manumea or Tooth-billed Pigeon (Didunculus strigirostris)*. Ministry of Natural Resources and Environment, Government of Samoan, Apia, Samoa.
- MNRE, 2006b. *Recovery Plan for the Ma'oma'o or Mao (Gymnomyza samoensis)*. . Ministry of Natural Resources and Environment, Government of Samoan, Apia, Samoa.
- Ollier, C.D., Whistler, W.A. and Amerson, A.B. 1979. *O le Pupu Pu'e National Park*. United Nations Development Advisory Team for the Pacific, Suva, Fiji.

Parrish, R., Stringer, I and Lester, P. 2004. Fauna survey of the Aleipata Islands, Samoa. 3rd Progress Report. *Institute of Applied Sciences Technical Report No. 2004/05*. Institute of Applied Sciences, the University of the South Pacific, Fiji.

Park, G., Hay, J., Whistler, W.A., Lovegrove, T and Ryan, P. 1992. *The National ecological Survey of Western Samoa: the conservation of biological diversity in the coastal lowland of Western Samoa*. New Zealand Department of Conservation.

Schuster, C., Whistler, W.A. and Tuiailemafua, S. 1997. *The Conservation of Biological Diversity in Upland Ecosystems of Samoa*, New Zealand Ministry of Foreign Affairs and Trade.

Schuster, C; Division of Environment and Conservation Post cyclone Bird Monitoring Surveys (1992-1996) unpublished accounts

Taulealo, T. I. 1993. *Western Samoa State of the Environment Report*. SPREP, Apia; Samoa

Tipama'a, T. and Beichle U., 2006. *RNHP Manumea Maomao Bird Survey Data*, in draft, (personal communications)

Tipama'a, T., 2001. *Preliminary Status Report on Bird Counts on Selected Monitoring Sites On Upolu & Savaii*, Unpublished final report . June 2001. 7pp

ANNEX 1: TERMS OF REFERENCE

Identification of Important Bird Areas for Western Samoa and completion of an associated IBA inventory

Context

The British Bird-watching Fair funds the project *saving the Endangered Parrots of the Pacific* which includes the objective of 'advancing the IBA programme in Samoa'. The Project will use field-based methods to derive the first inventory of internationally important bird areas in Samoa and raise the profile of and support for IBAs among government agencies, national stakeholders landowners and civil society.

The Samoan IBA inventory will be one of five Pacific Island Countries and Territories (PICTs) to be completed using field-based techniques predominately by BirdLife partners. IBAs for a further 15 PICTs will or have been completed through desk-based methods largely under the regional European Commission project to BirdLife Pacific completed in 2008.

Overall Purpose

To identify and report IBAs consistent with current international criteria and informed by field and desk-based techniques. Inform national stakeholders, governmental departments landowners and civil society of IBAs and in consultation with these representatives agree on Samoa's IBA designations.

Specific Tasks

1. Survey priority sites to delimit IBA boundaries using recognised IBA data collection techniques.
2. Identify, inform and engage IBA landowners, governmental, national, and civil society stakeholders in the IBA process.
3. Identify candidate IBAs using trigger species and regional colonial water bird thresholds (Annex 2); IBAs are also informed by the 'Review of the Status of Samoan Avifauna' (Annex 3) and through the application of guidelines for 'Pacific IBA methods' (Annex 4) and any other reliable data sources available including other published IBA inventories.
4. Compile the IBA inventory and consult with key stakeholders to agree on IBA designations and boundaries.
5. Consult with BirdLife staff and the Project Steering Committee over the mapping of IBA boundaries and the provision of data for the World Bird Database.
6. Produce a final IBA inventory for Samoa which, in addition to the base publication criteria, incorporates survey information, feedback from consultations, and peer review comments.
7. Ensure input by the Project Steering Committee is obtained in developing the IBA inventory and maximise project outcomes including mechanisms for sustaining IBAs and the IBA process in Samoa.

Outputs

1. A final peer-reviewed IBA inventory of Samoa incorporating survey information and consultation feedback and consistent with current IBA criteria and content including:
 - a general national introduction;
 - a summary of ornithological importance;
 - a summary of key conservation issues and threats to identified IBAs;
 - a summary of conservation actions and mechanisms;
 - a site inventory including for each identified IBA:
 - ✓ a site description
 - ✓ bird species including the detailed listing of trigger species leading to the designation of a site
 - ✓ other endemic or threatened wildlife
 - ✓ conservation issues

- maps showing the locations of each IBA and the IBA boundary;
 - References.
2. Surveys determine bird population size and IBA boundaries for all priority sites and species identified in the *Review of the Status of Samoan Avifauna* and survey data recorded and reported.
 3. IBA stakeholders (landowners, MNRE) participate in survey process as appropriate.
 4. A workshop organised and convened with national stakeholders, governmental agencies and civil society informing representatives of the IBA process and feedback obtained on proposed IBA designations. Workshop outcomes reported and contacts for IBA dissemination identified.
 5. A workshop organised and convened with key IBA landowners supported by an IBA expert to raise IBA awareness and obtain feedback on proposed designations. Workshop format, participation, and outcomes reported as a template for future community engagement.
 6. Steering Committee provides guidance to the IBA project.
 7. A process and stakeholder support for sustaining IBAs in Samoa identified and documented.
 8. Final IBA inventory (of a publishable standard), reports, survey & IBA data provided in electronic format.

ANNEX 2. LIST OF TRIGGER SPECIES

Category A1

Globally threatened species – CR, EN; regular presence may be sufficient to define an IBA

| | |
|---|----|
| Samoan moorhen (<i>Gallinula pacifica</i>) | CR |
| Tooth-billed Pigeon (<i>Didunculus strigirostris</i>) | EN |
| Mao (<i>Gymnomyza samoensis</i>) | EN |

Globally threatened species – Vu, NT; significant population (>10 pairs or 30 individuals) may be sufficient to define an IBA. Popn estimates may be inferred from area of habitat etc.

| | |
|---|----|
| Bristle-thighed Curlew (<i>Numenius tahitensis</i>) | VU |
| Shy Ground-dove (<i>Gallinula pacifica</i>) | VU |
| Samoan Flycatcher (<i>Myiagra albiventris</i>) | VU |
| Samoan White-eye (<i>Zosterops samoensis</i>) | VU |
| Samoan Triller (<i>Lalage sharpei</i>) | NT |

Category A2

Range restricted species – sites chosen such that they form a network across the country that contain all species that make up the Samoan EBA. Larger IBAs with more species often chosen first. Note overlap with category A1 species.

| |
|--|
| Samoan Moorhen (<i>Gallinula pacifica</i>) |
| Shy Ground-dove (<i>Gallinula pacifica</i>) |
| Many-coloured Fruit-dove (<i>Ptilinopus perousii</i>) |
| Tooth-billed Pigeon (<i>Didunculus strigirostris</i>) |
| Purple-capped Fruit-dove (<i>Ptilinopus porphyraceus</i>) |
| Blue-crowned Lorikeet (<i>Vini australis</i>) |
| Flat-billed Kingfisher (<i>Todiramphus recurvirostris</i>) |
| Wattled Honeyeater (<i>Foulehaio carunculatus</i>) |
| Mao (<i>Gymnomyza samoensis</i>) |
| Cardinal Myzomela (<i>Myzomela cardinalis</i>) |
| Polynesian Triller (<i>Lalage maculosa</i>) |
| Samoan Triller (<i>Lalage sharpei</i>) |
| Samoan Flycatcher (<i>Myiagra albiventris</i>) |
| Samoan Whistler (<i>Pachycephala flavifrons</i>) |
| Samoan White-eye (<i>Zosterops samoensis</i>) |
| Samoan Fantail (<i>Rhipidura nebulosa</i>) |
| Fiji Shrikebill (<i>Clytorhynchus vitiensis</i>) |
| Samoan Starling (<i>Aplonis atrifusca</i>) |
| Polynesian Starling (<i>Aplonis tabuensis</i>) |
| Red-headed Parrotfinch (<i>Erythrura cyaneovirens</i>) |

SPECIES DESCRIPTIONS

The following 14 species descriptions focus on the land bird species of conservation concern, but with one sea bird included. Further research on the conservation status of sea birds is needed.

Each description begins with the common name, scientific name and then local name followed by an indication in brackets of the conservation status of the bird (2008 IUCN Redlist category: CR = critically endangered; EN = endangered; VU = vulnerable; or cc = national conservation concern).

Samoa Woodhen/Moorhen (*Galinula pacifica*) Puna'e (CR)

The Samoa Moorhen is a flightless olive-black rail that is endemic to Savaii and known only from one mountain, near Aopo village in the cloud forests of north central Savaii (Elmqvist *et al*, 1998; Taule'alo 1993:70). The Puna'e is listed as 'critically endangered' on the 2008 IUCN Red List although recent surveys failed to find it indicating that it may be extinct (Mittermeier 2006). It has an estimated population of less than 50 individuals and its population trend is unknown (Birdlife International 2000). The main threats to its survival are hunting and predation by invasive mammal pests such as rats, cats, pigs and dogs (Watling 2001, Mittermeier 2006). The Samoa Woodhen has not been formally observed since 1908, but limited ornithological work has been conducted in the area so it may still survive (Taulealo 1993:22).

1. Samoa Friendly Ground Dove/ Shy Ground Dove (*Galicolumba stairi*) Tuaimao (VU)

The Friendly ground dove is a medium sized brown ground dove. It is a poor flyer and usually escapes by running. In Samoa it is very rare being restricted to the offshore Aleipata islands, the Tafua rainforest on Savaii and at low densities in the upland forests of both main islands. Being a ground dweller, the Friendly ground dove has been badly impacted by invasive mammals, and its preferred habitat, the dry open forests of coastal areas, is under severe threat from cyclone damage to the forests and land clearing.

2. Many Coloured Fruit Dove (*Ptilinopus perousi*) Manuma (cc)

The many coloured fruit dove or manuma is a small, compact, but beautiful dove. The manuma is a forest dweller and is often seen on its favourite food tree – the fig. At first glance the male bird appears pale cream, but close up it can be seen to be truly multi-coloured. The female is grey-green with pale yellow under tail coverts and is often confused with the crimson crowned fruit dove. Both male and female have a crimson cap. The manuma is threatened by hunting and habitat change.

3. Tooth-billed Pigeon (*Didunculus strigirostris*) Manumea (EN)

The Manumea is endemic to Samoa at the generic level. Its taxonomic position has been much debated and it is of ancient origin with no clear lineage to existing pigeons anywhere in the world (Park *et al* 1992:36). This pigeon only lives within and on the edges of mature native forest in both Upolu and Savaii. Its numbers have declined dramatically, mostly through loss of habitat and hunting and it is now considered to be in significant danger of extinction (MNRE 2006a).

The Tooth-billed Pigeon is listed as 'endangered' on the 2008 IUCN Red List. It qualifies for this status because it has a very small and fragmented range and population, and its range and population are declining due to forest destruction from cyclones and development.

The Manumea is of cultural significance to Samoans, used in the past as a food of high status and is now known as the national bird and was the mascot for the South Pacific Games in 2007 (MNRE 2006a). A comprehensive 10 year recovery plan has been prepared for the conservation of the Manumea (MNRE 2006a) and significant progress is now underway to implement this plan.

4. Blue-crowned Lory (*Vini australis*) Segavao (cc)

The segavao is a bright emerald green lory with a conspicuous red throat, ear coverts and abdominal pouch and with purple-blue thighs, crown and lower abdomen (Watling 2001). The only parrot like bird in Samoa, the Segavao feeds on flowering trees and nests in cavities or in dead standing coconut trees (Elmqvist *et al* 1998:67). This bird is not as common in Samoa as it was formerly and is thought to be impacted by invasive mammals, in particular ship rats.

5. Samoan Triller (*Lalage sharpie*) Miti Vao (NT)

The Samoan Triller is endemic to Samoa, with separate sub-species/races recognized on Savaii and Upolu (Taule'alo 1993:71). The Miti Vao is a little known, quiet and shy species that is mostly recorded singly rather than in pairs or flocks. It is a dull bird, grayish brown in color, with white iris, orange bill and

barred flanks (Elmqvist *et al* 1998:79) and is most frequently seen at forest edges and forest clearings in upland areas (Watling 2001).

6. Samoan Broadbill/Flycatcher (*Myiagra albiventris*) Tolai fatu (VU)

The Samoan Broadbill is an uncommon Samoan endemic that usually moves singly rather than in pairs or flocks and prefers forest edges to dense forest. The bird looks like a European flycatcher, but is in fact unrelated (Elmqvist *et al* 1998:70). The male is glossy blue-black with a white chest and rust-coloured throat while the female is and more dull. The breeding habits of the Samoan Broadbill are not known (Elmqvist *et al* 1998:70). The Tolai fatu is classified as 'vulnerable' and has suffered a rapid decline in population numbers following the cyclones of the early 1990s and has appeared to recovered but now mostly resides in undergrowth of secondary forests.

7. Samoan White-eye (*Zosterops samoensis*) Mata-papae (VU)

The Samoan white –eye, a tiny light green bird with a white-eye ring, is endemic to Savaii and may have a range of less than 150 km². It lives in flocks and inhabits montane forest, generally above 1,000m in elevation but occasionally down to 700m (Elmqvist *et al* 1998: 97). Recent surveys of upland ecosystems a on Savaii indicate that the Samoan White-eye is fairly abundant (Schuster, *et al* 1997:10; Tipama'a & Biechle, 2006) although the 2008 IUCN Redlist shows this bird as vulnerable to extinction because of its small range.

8. Mao (*Gymnomyza samoensis*) Ma'oma'o (EN)

The Ma'oma'o is endemic to the Samoan archipelago; however it has not been sighted in American Samoa since 1977 and is now believed to occur only in Samoa. It is a large, slim honeyeater with a long, down-curved bill and is described as having a remarkable voice. The Ma'oma'o is generally restricted to large areas of mature forest although can be seen in disturbed areas near forest edges. During recent bird surveys (MNRE 2006b) the ma'oma'o was recorded at a wide range of elevations ranging from 284 meters to 803 meters on Upolu and 463m to 1547m in Savaii. The Ma'oma'o is threatened by habitat loss and degradation and also by invasive species such as rats and some hunting (MN RE 2006b).

Since the bird is generally restricted to mature forest and the area of undisturbed mature forest has significantly declined in Samoa, the bird is of significant conservation concern. A comprehensive 10 year recovery plan has been prepared for the conservation of the Ma'oma'o (MNRE 2006b) and significant progress is now underway to implement this plan.

10. Red-headed Parrotfinch (*Erythrura cyaneovirens*) Segasegamau'u (cc)

The Segasegamau'u is a small green endemic finch with a striking scarlet rump and tail and a crimson head. This is a bird of the forest and is associated with forest clearings. It is primarily a seed eater but also eats insects, nectar and berries. In Samoa this bird is uncommon and was badly affected by the cyclones of the early 1990s. It is threatened by rats, mice and deforestation.

11. Polynesian Starling (*Aplonis tabuensis brevirostris*) Fuia vao (cc)

A subspecies race of Polynesian Starling, endemic to the Samoan Archipelago (Taule'alo 1993:70). This uncommonly occurring forest species has a dark brown head and back, lighter grayish brown chest and belly, dark crown and yellow eye. The Polynesian Starling forages in small flocks, primarily in interior forest areas, for fruits and insects. It nest in tree cavities, sometimes close to ground level (Elmqvist *et al* 1998:71)

12. Island Thrush (*Turdus poliocephalus samoensis*) Tutumalili (cc)

The Tutumalili is restricted to areas of mature upland forest and is quite rare on Upolu. This shy medium sized bird is a ground feeding species that eats snails, worms and insects in loose leaf litter. The Samoan sub-species is entirely black but is slightly lighter on the head and throat with yellowish-red feet (Watling

2001) and appears very similar to the European Black bird (Elmqvist *et al* 1998: 79).

13. Scarlet Robin (*Petroica multicolor pusila*) Tolaiula (cc)

The Tolaiula is a small robin with a large head and upright posture which is endemic at the sub species level to Samoa. The male has a bright cherry red breast and black upperparts, head and throat. The female is similar but with duller brown upperparts and only a pale pink underparts with a whitish central region (Watling 2001). The bird is most commonly seen at the edge of forests or in forest clearings and at altitudes of above 300m where it pursues flying insects.

14. Polynesian Storm Petrel (*Nesofregatta fuliginosa*) Ta'i'o (VU)

The Polynesian Storm Petrel has a small population and breeding range. It is thought to have occurred on mixed beach and rocky coastlines in Samoa (Birdlife International 2000:71) although there have not been recent confirmed breeding records or even observations in Samoa (Watling 2001). The bird has sooty black upperparts, sooty brown upper wings with a pale bar across the middle of the inner wing. This bird feeds on small fish, crustaceans and cephalopods and nests throughout the year in loosely-formed colonies.

It is classified as 'vulnerable' because it has a small population and breeding range with many breeding locations disappearing and surviving populations declining due to invasive predators (Birdlife International 2000:71). In Samoa it should be considered data deficient (Watling 2001).

ANNEX 3. THRESHOLDS FOR COLONIAL WATERBIRD POPULATIONS

Table of 1% thresholds for Pacific waterbirds (Category A4i)

| English and Scientific name | Bioregion (distribution of regional population) | 1% regional population (individuals) | 1% global population (individuals) |
|---|---|--------------------------------------|------------------------------------|
| Australasian Grebe <i>Tachybaptus novaehollandiae</i> | Pacific (Aus and Melanesia) | 10,000 | 10,000 |
| Little Black Cormorant <i>Phalacrocorax sulcirostris</i> | Pacific (Aus, NZ, NG, NC) | 10,000 | 10,000 |
| Great Cormorant <i>P. carbo</i> | Pacific (Aus, NG, NZ, Rennell, NC) | 10,000 | 20,000 |
| Little Pied Cormorant <i>P. melanoleucos</i> | Pacific (Aus, NG, Melanesia, NZ) | 10,000 | 10,000 |
| Great (White) Egret <i>Ardea (Casmerodius) alba</i> | Pacific (Aus, NG, NZ) | 1,000 | 20,000 |
| Yellow Bittern <i>Ixobrychus sinensis</i> | Pacific (Micronesia) | 10,000 | 10,000 |
| Grey Teal <i>Anas gracilis</i> | Global (Aus, NZ and NC) | 20,000 | 20,000 |
| Pacific Black Duck <i>Anas superciliosa</i> | Global (Indonesia, Aus, NG, Pacific Islands, NZ) | 11,000 | 11,000 |
| Hardhead <i>Aythya australis</i> | Global (Aus, Vanuatu, NC) | 10,000 | 10,000 |
| Pacific Golden Plover <i>Pluvialis fulva</i> | East Asian flyway and Alaska migrating to central Pacific | 1,400 | 2,000 |
| Double-banded Plover <i>Charadrius b. bicinctus</i> | NZ migrating north | 500 | 500 |
| Bar-tailed Godwit <i>Limosa lapponica</i> | East Asian flyway and Alaska migrating to central Pacific | 3,300 | 11,000 |
| Whimbrel <i>Numenius phaeopus variegatus</i> | East Asian Flyway | 550 | 20,000 |
| Bristle-thighed Curlew <i>Numenius tahitiensis</i> | Global (Alaska migrating to central Pacific) | 100 | 100 |
| Grey-tailed Tattler <i>Tringa (Heteroscelus) brevipes</i> | Global (East Asian flyway) | 400 | 400 |
| Wandering Tattler <i>T. (H.) incana</i> | Global (Alaska migrating to American W coast and Pacific) | 250 | 250 |
| Tuamotu Sandpiper <i>Prosobonia cancelata</i> | Global (Tuamotu archipelago) | 6 | 6 |
| Ruddy Turnstone <i>Arenaria interpres</i> | East Asian Flyway and Alaska migrating to central Pacific | 1,000 | 7,000 |
| Sanderling <i>Calidris alba</i> | East Asian Flyway | 220 | 7,000 |
| Silver Gull <i>Larus novaehollandiae</i> | Global (Aus, NC) | 20,000 | 20,000 |
| Crested Tern <i>Sterna bergi cristata</i> | Pacific (Aus; small numbers in Pacific Islands) | 5,000 pairs | 6,000 pairs |
| Roseate Tern <i>S. dougali bangsi</i> and <i>S. d. gracilis</i> | Pacific (Aus, Melanesia) | 130 pairs | 500 pairs |
| Black-naped Tern <i>S. sumatrana</i> | Pacific (Aus, Pacific Islands) | 1000 pairs | 1000 pairs |
| Common Tern <i>S. hirundo longipennis</i> | East Asian Flyway | 10,000 | 20,000 |

| English and Scientific name | Bioregion (distribution of regional population) | 1% regional population (individuals) | 1% global population (individuals) |
|---|---|--------------------------------------|------------------------------------|
| Little Tern <i>S. albifrons placens</i> and <i>S. a. sinensis</i> | Pacific (Aus, NG, Solomons) | 40 pairs | 1000 pairs |
| Fairy Tern <i>S. nereis</i> | Global (Aus, NC, NZ) | 30 pairs | 30 pairs |
| Grey-backed Tern <i>S. lunata</i> | Global (Hawai i, Micronesia, Tuamotus) | 1000 pairs | 1000 pairs |
| Bridled Tern <i>S. a. anaethetus</i> and | Pacific | 1000 pairs | 7000 pairs |
| Sooty Tern <i>S. fuscata</i> | Pacific | 20,000 | 20,000 |
| Brown (Common) Noddy <i>Anousstolidus pileatus</i> | Pacific | 5,000 pairs | 12,000 pairs |
| Black Noddy <i>A. minutus</i> | Pacific | 4,000 pairs | 6,000 pairs |
| Blue Noddy <i>Procelsterna cerulea</i> | Global (tropical Pacific) | 200 pairs | 200 pairs |
| Grey Noddy <i>Procelsterna albivitta</i> | Global (sub-tropical Pacific) | 250 pairs | 250 pairs |
| White Tern <i>Gygis alba</i> (including Little White Tern <i>G. microrhyncha</i>) | Pacific | 1000 pairs | 10,000 pairs |

Table of 1% thresholds for Pacific seabirds (Category A4ii)

In most cases follow Brooke (2004a) as the most authoritative guide, updating previous BirdLife estimates. Where BirdLife (2004b) has estimated numbers for threatened species, these figures are used as they are likely to be more accurate and more precautionary than figures in Brooke (2004a).

| English and Scientific name | Global population estimate | 1% threshold |
|--|----------------------------|--------------|
| Wedge-tailed Shearwater <i>P. pacificus</i> | 5,200,000 individuals | 10,000 pairs |
| Christmas Shearwater <i>P. nativitatis</i> | 50,000 pairs | 500 pairs |
| Little Shearwater <i>P. assimilis</i> | 300,000 pairs | 3,000 pairs |
| Audubon's Shearwater <i>P. lherminieri</i> | 150,000 pairs | 1,500 pairs |
| Heinroth's Shearwater <i>P. heinrothi</i> | 500 individuals | 1 pair |
| Bulwer's Petrel <i>Bulweria bulweri</i> | 750,000 individuals | 1,500 pairs |
| Tahiti Petrel <i>Pseudobulweria rostrata</i> | 10,000 pairs | 100 pairs |
| Beck's Petrel <i>P. becki</i> | 25 individuals | 1 pair |
| Fiji Petrel <i>P. macgilivrayi</i> | 25 individuals | 1 pair |
| Black-winged Petrel <i>Pterodroma nigripennis</i> | 9,000,000 individuals | 20,000 pairs |

| | | |
|---|------------------------|-------------|
| Collared Petrel <i>P. brevipes</i> | 5,000 individuals | 10 pairs |
| Gould's Petrel <i>P. leucoptera</i> | 5,000 pairs | 50 pairs |
| Phoenix Petrel <i>P. alba</i> | 5,000 individuals | 10 pairs |
| Henderson Petrel <i>P. atrata</i> | 16,000 pairs | 160 pairs |
| Kermadec Petrel <i>P. neglecta</i> | 55,000 pairs | 550 pairs |
| Herald Petrel <i>P. heraldica</i> | 50,000 pairs | 500 pairs |
| Murphy's Petrel <i>P. ultima</i> | 265,000 pairs | 2,650 pairs |
| White-bellied Storm-petrel <i>Fregatta gralaria</i> | 100,000 pairs | 1000 pairs |
| Polynesian Storm-petrel <i>Nesofregatta fuliginosa</i> | 1700 pairs | 17 pairs |
| Red-tailed Tropicbird <i>Phaethon rubricauda</i> | 32,000 individuals | 80 pairs |
| White-tailed Tropicbird <i>P. lepturus</i> | 50,000 individuals | 125 pairs |
| Masked Booby <i>Sula dactylatra</i> | 200,000 individuals | 500 pairs |
| Red-footed Booby <i>S. sula</i> | 600,000 individuals | 1,500 pairs |
| Brown Booby <i>S. leucogaster</i> | 200,000 individuals | 500 pairs |
| Great Frigatebird <i>Fregata minor</i> | 340,000 individuals | 850 pairs |
| Lesser Frigatebird <i>F. ariel</i> | 200,000 individuals | 500 pairs |