

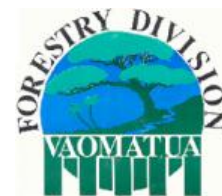
O LE PUPŪ-PU'E NATIONAL PARK MANAGEMENT PLAN

2010-2014



July 30, 2010

Forestry Division
Ministry of Natural Resources and Environment



MANAGEMENT PLAN
OF THE
O LE PUPŪ PU'E NATIONAL PARK

Project for Enhancing Management Capacity of National
Parks and National Reserves of Samoa (2007-2010)

MNRE/JICA

Forestry Division, Ministry of Natural Resources &
Environment

Apia, Samoa

July 30, 2010

To ensure conservation of the rich diversity therein and to provide a comfortable and enjoyable
visit for all people.

FOREWORD

It is with great pleasure and honor to convey my endorsement to this Management Plan for O Le Pupū Pu'e National Park at Togitogiga on behalf of the Government of Samoa. This Management Plan provides basic information on the Park's environmental status as well as set out management issues to maintain the Park's nature and facilities.

The Management Issues stresses what needs to be maintained and improved to make sure that it provides the functions of a National Park to cater for the needs of its visiting people. Guided by the National Parks and Reserves Act 1974, this Plan also articulates issues that are arising within the Park to make sure that protection and conservation of the integrity of the Park is complete.

Consultations through meetings and workshops with relevant stakeholders have been conducted collecting information needed to compile the plan. A series of surveys have also been done with financial assistance of the JICA/MNRE Project for Enhancing Management Capacity of National Parks and Reserves of Samoa, providing the updated information which is inserted into the relevant sections of the plan.

The current status of the Park itself is significantly contributes to the arising environmental problems such as land degradation, destruction of wildlife habitats and ecosystems and most importantly the arising impacts of climate change. Hence, strengthening the protection of the park through enforcement of the legislations available and working together with the neighbouring communities is necessary. Moreover, the continuous financials support of the Donor Funded Agencies and availability of the necessary resources is always a matter needed to review and update this plan in due course.

Thus, the Government of Samoa is indeed very happy to present this management plan and endorse its activities outlined with hopes that the success of its implementation is in the hands of all Samoans.

Soifua

Faumuina Tiatia Liuga

Minister of Natural Resources & Environment

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	5
ACRONYMS	6
O LE PUPU PU'E NATIONAL PARK MANAGEMENT PLAN	
SECTION 1: INTRODUCTION.....	7
1.1 Purpose of the Management Plan	7
1.2 Process of the Management Plan Formulation	7
1.3 Structure of the Management Plan	8
SECTION 2: LEGISLATIVE CONTEXT	8
2.1 Establishment of the Park.....	8
2.2 Relevant Laws and Policies	9
2.3 International Standards.....	10
2.4 Management Agency and Structure	11
SECTION 3: SUMMARY OF THE PARK	12
3.1 History	12
3.2 Location, Area and Boundary.....	13
3.3 Visitors	14
3.4 Natural Environment	14
3.4.1 Geology, Landforms, Soils and Catchments	14
3.4.2 Flora	15
3.4.3 Fauna	17
3.5 Cultural Heritage	19
3.6 Visitor Attractions	19
SECTION 4: MANAGEMENT DIRECTIONS	23
SECTION 5: MANAGEMENT STRATEGIES	23
5.1 Boundary	23
5.2 Nature Conservation	24
5.3 Zoning	26

5.4	Offences and Enforcement	27
5.5	Fees	29
5.6	Trails	30
5.7	Togitogiga Waterfall Recreational Area	31
5.8	Visitor Centre	32
5.9	Cultural Heritage	33
5.10	Recreational Activities	34
5.11	Awareness activities	35
5.12	Relationship with Neighboring Communities	36
5.13	Research Activities	37
5.14	Forestry Office & Nursery	37
REFERENCES		39

ACKNOWLEDGEMENTS

We extend our sincere appreciation to all who contributed to the preparation of this Management Plan Document for the O Le Pupū Pu'e National Park in Togitogiga. The assistance provided has completed this plan successfully to the end. Thus your continuous support will be marked respectfully and is honored.

- Great appreciations and thanks to JICA for funds and technical assistance made available through the JICA/MNRE Project for Enhancing Management Capacity for National Parks & Reserves of Samoa which enabled this plan to move forward ()
- The valuable input by various stakeholders including the neighbouring communities (Saaga, Saleilua, Poutasi and Togitogiga), Non Government Organisations (METI, O le Siosiomaga Society, SUNGO WIBD, US Peace Corps), Regional and International Organisations (SPREP, CI, PILN, UNDP, FAO, UNEP, NZAID, JICA, PECL) Government Ministries (MAF, MWCSO) and the general public
- The MNRE Division/sections that were involved in the collection of the data needed and the Forestry Division staff who directly worked in the compilation of this plan.

Last but not the least to the Government of Samoa for supporting the development of this document which contains of useful information about the park and its management.

ACRONYMS

ACEO – Assistant Chief Executive Officer
CBD – Convention on Biological Diversity
CEO – Chief Executive Officer
CI – Conservation International
DEC – Division of Environment and Conservation
FD – Forestry Division
IPCC – Intergovernmental Panel on Climate Change
IUCN – International Union for Conservation of Nature
JICA – Japan International Cooperation Agency
LSE – Lands, Survey and Environment
MNRE – Ministry of Natural Resources and Environment
NBSAP – National Biodiversity Strategy and Action Plan
NISAP – National Invasive Strategy and Action Plan
NUS – National University of Samoa
NZODA – New Zealand Overseas Development Assistance
UNDAT – United Nations Development Advisory Team
UNEP – United Nations Environment Programme

1.1. Purpose of the Management Plan

In Samoa's *National Biodiversity Strategy and Action Plan 2001* (NBSAP) it states and set the objective for this project "to enhance the management of existing protected areas and establish new ones to increase coverage of protected areas to 15% and achieve a full representation of Samoa's ecosystems" In light of this statement one such action towards achieving this objective is by "developing and implementing management plans for the existing protected areas in Samoa"

A "Management Plan for the O Le Pupū Pu'e National Park" was first formulated in 1981 and has not been revised since then. Circumstances for park management have changed significantly and some sections of the Management Plan are now out of date. The *Lands, Surveys and Environment Act 1989* states that "every approved management plan shall be reviewed upon the expiration of five years after coming into force". According to the Act, the previous management plan expired many years ago and needs to be revised urgently.

The National Park Management Plan is a legal document that sets out how the National Park's management will be delivered in accordance with the *National Parks and Reserves Act 1974* and the *Lands, Surveys and Environment Act 1989*. This plan seeks to give guidance and clear directions for management by the Ministry of Natural Resources and Environment (MNRE) for the next five years, while remaining flexible enough to provide for changing circumstances within the given period.

1.2. Process of the Management Plan Formulation

The Management Plan was formulated under the "Project for Enhancing Management Capacity for National Parks and Reserves of Samoa 2007-2010", which was implemented by MNRE in cooperation with Japan International Cooperation Agency (JICA). Firstly policies and measures in relation to the National park were examined which were then followed by a review of existing information and a series of surveys were conducted on ecosystems, visitors and the socio-economic situation of neighboring communities to obtain information for drafting the Management Plan.

The *Lands, Surveys and Environment Act 1989* determined the process of submitting the draft management plan as follows.

116. (2) When the director has prepared a draft management plan and such plan has been considered by the Board, the Director¹ shall, by public notice:

- (a) State that a management plan has been prepared and the areas affected by;
- (b) Specify the place or places where such a plan is displayed and may be inspected by interested persons;
- (c) Invite interested persons to make representations in connection with the draft management plan by a specific date, being not less than one month after the publication of the notice;

¹ The current Chief Executive Officer (CEO)

(d) Specify an address to which such representations may be forwarded.

The first draft of this Management Plan was circulated to various stakeholders for comment and input. After revisions of the draft plan, stake holders were invited to a public hearing held at Apia. A similar hearing was also held at the National Park to which people from neighboring communities were invited. The final draft was prepared based on the discussions at these public hearings.

When major revision or amendment of this Management Plan will take place, a similar process will also follow to ensure the opinions of various stake holders are well reflected in the plan.

1.3. Structure of the Management Plan

The Management Plan is designed to provide necessary information about park management for managers, rangers and various stakeholders. It covers basic information on the National Park such as natural and cultural features, visitor facilities and attractions, as well as management issues such as park regulations, facility maintenance and management zoning. The structure of the Management Plan is shown as follows:

Section 1 introduces the Management Plan, its purpose, structure and how it has been developed.

Section 2 explains the legislative context of the National Park. All laws and policies relevant to National Park management are described, and the structure and responsibilities of management agencies are explained. This section also sets out the international and national context of the National Park.

Section 3 paints a general picture of the National Park, including a description of the landscape, natural and cultural resources and its visitors.

Section 4 provides a short and clear vision for the management of the National Park.

Section 5 presents the framework for the management of the National Park. Boundaries, management zoning, regulations for park users and their enforcement are clearly explained, and management and maintenance of park facilities are discussed. The relationship with neighboring communities and awareness activities are also included in this section.

SECTION 2: LEGISLATIVE CONTEXT

2.1 Establishment of the Park

In 1974, Western Samoa passed legislation for establishing National Parks and Reserves System on Public Lands titled “National Parks and Reserves Act” (Government of Western Samoa, 1985 cited in Pearsall 1993). In the Act, the process of establishing national parks are set forth in the following.

Establishment of national parks – (1) The Head of State, acting on the advice of Cabinet, may from time to time by Order declare any public land –

- (a) That is not set aside for any other public purpose; and
- (b) That is not less than 1,500 acres in area, or that is an island – to be a National Park.

(2) Every Order under this section shall designate the National Park so established by a distinctive name, in the following manner:

“The National Park”.

(3) No Order under this section may be revoked otherwise than by Act of Parliament.

In 1978, based on the United Nations Development Advisory Team (UNDAT) plan, 2857 ha of Public Land on the southern side of Upolu were set aside as ‘O Le Pupū Pu’e National Park (Government of Western Samoa, 1985). O Le Pupū Pu’e extends from the mountain top to the coast and includes the entire topographic gradient leeward of Upolu (Ollier et al., 1979; Trotman, 1979)

2.2 Relevant Laws and Policies

The Management Plan has to relate to, and be consistent with laws, policies and plans at the higher level. Major relevant laws are described below. They were prepared some years ago and government structure has changed since these legislations came into force. Care should be taken to avoid misunderstanding when these legislations are referred to.

Lands, Surveys and Environment Act 1989

The Lands Surveys and Environment Act 1989 is “an Act to.....make provision for the conservation and protection of the environment and the establishment of national parks and other forms of protected areas...”

Part VIII of the Act under Environment and Conservation, it states that the principal functions of the Ministry include making recommendations to the Minister in relation to:

- the establishment and naming of national parks and/or nature reserves;
- the administration, management and control of national parks and reserves including the protection, conservation and management of wildlife, water resources and other marine and terrestrial ecosystems.

The Act also emphasizes the Conservation Officer’s² powers of enforcement concerning national parks and other protected areas as well as being responsible for the preparation of management plans.

National Parks and Reserves Act 1974

This Act is the fundamental legislation for the National Park management. The Act defines the status of national parks as follows.

Every national park shall be preserved in perpetuity for the benefit and enjoyment of the people of Western Samoa, and shall be administered so that

- a) *It is preserved as far as practical in its natural state, and*

² Is any officer of the Ministry that is given an authority (issue an ID card) by the Minister to enforce environment laws

- b) *The flora and fauna in the National Park are preserved as far as possible; and*
- c) *Its value as a soil, water, and forest conservation area is maintained; and*
- d) *Subject to the provisions of this Act, and to the imposition of any conditions or restrictions that are necessary for the preservation, of the natural features and the flora and fauna in the park, and for the general benefit of the park, the public shall have freedom of entry and access to the park so that they may receive in full measure all the benefits, including inspiration, aesthetic appreciation, enjoyment, and recreation, that may be derived from the natural features of the park.'*

The Act provides a description of the general powers of the minister in respect of national parks, and also general regulations and offences. These are discussed in Section 5.

As already mentioned in Section 1, Samoa's *National Biodiversity Strategy and Action Plan 2001* has set the objectives which are to increase protected areas and to improve their management. The *Strategy for the Development of Samoa 2008-2012* (SDS), notes their concern at the loss of biodiversity of the country. It also includes environment sustainability as one of the seven goals. The percentage of area covered by forest and size of protected area are set as indicators to measure the achievement of these goals. Other relevant policies and laws are as follows:

- National Policy on Forestry and Sustainable Development 2007
- National Adaptation Programme of Action 2005
- State of the Environment Report 2008-2011
- National Environment Management Strategy
- Policy on the Conservation of Biological Diversity 2007
- Protection of Wildlife Regulation 2004

2.3 International Standards

All the South Pacific countries are included under biodiversity hotspots (Conservation International 2004) and protecting biodiversity of the region is thus a global concern. The establishing and management of these protected areas are two most important measures for biodiversity conservation.

Samoa has the second largest native flora in tropical Polynesia, (after Hawai'i). There are about 550 native flowering plant species and about 30% are endemic to the archipelago, which means they are only found in Samoa (Whistler 2004, page). There are 35 land bird species in Samoa: of which eight species are endemic (DEC 1998) and 14 are listed as 'rare or endangered' (Dahl 1980). The ecosystems of Samoa are generally both unique and fragile. The Government of Samoa ratified the Convention on Biological Diversity (CBD) in 1994 and prepared its National Biodiversity Strategy and Action Plan (NBSAP) to protect the ecosystems of the country.

The O le Pupū Pu'e National Park should be managed to meet international standards. The Park fits the definition of a protected area adopted by the International Union for Conservation of Nature (IUCN) as shown below.

“A clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.” (Dudley 2008, page)

The IUCN has defined a series of six protected area management categories, based on primary management objectives shown in Table 2.1 (IUCN 1994)

Table 2.1. Classifications of Categories of Protected Area Management

Category Ia	Strict Nature Reserve: protected area managed mainly for science
Category Ib	Wilderness Area: protected area managed mainly for wilderness protection
Category II	National Park: protected area managed mainly for ecosystem protection and recreation
Category III	Natural Monument: protected area managed mainly for conservation of specific natural features
Category IV	Habitat/Species Management Area: protected area managed mainly for conservation through management intervention
Category V	Protected Landscape/Seascape: protected area managed mainly for landscape/seascape conservation and recreation
Category VI	Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems

In the World Database on Protected Areas (UNEP/IUCN), the O Le Pupū Pu'e National Park is classified under Category II as a National Park.

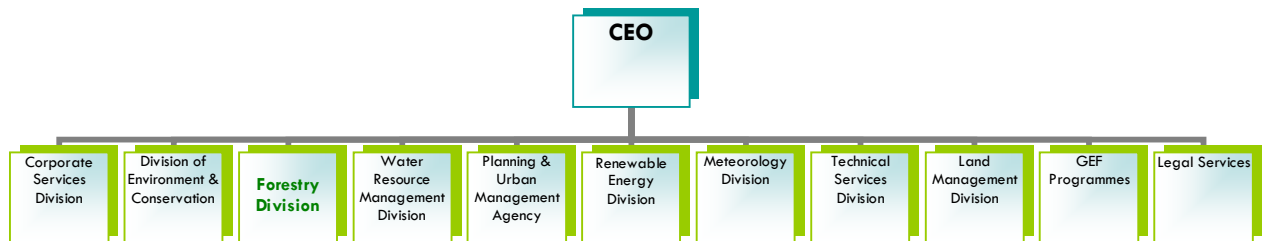
2.4 Management Agencies and Structure

The O Le Pupū Pu'e National Park was firstly managed by the Forestry Division, of the Ministry of Agriculture, Forestry, Fisheries and Meteorology. However, the park administration was then handed over to the Division of Environment and Conservation, Lands, Surveys and Environment Department after its establishment in 1989. In 2005, following government reforms the Forestry Division merged with the Ministry of Natural Resources and Environment, which effectively gives back to the Forestry Division its responsibility for National Parks in 2007.

The Ministry of Natural Resources and Environment (MNRE) comprises eleven (11) divisions. (Refer to Chart 1) Each division is allocated specific objectives

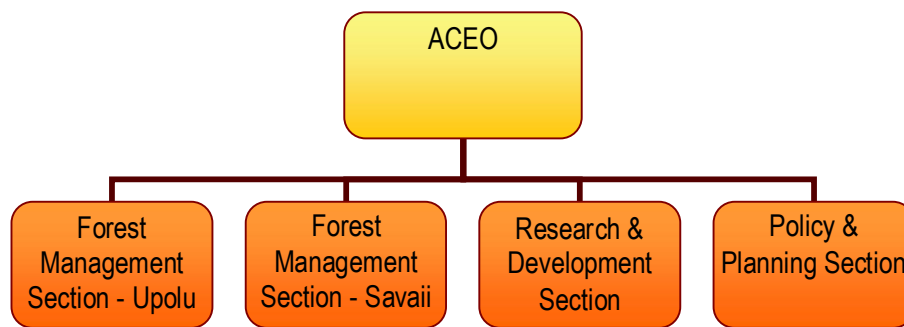
linked to the ministerial mission of managing Samoa’s natural resources in a sustainable manner.

Structure of the Ministry of Natural Resources and Environment



The management of the O le Pupū Pu’e National Park is the sole responsibility of the Forestry Division. According to the MNRE’s Corporate Plan (2008-11), the Forestry Division is assigned the management of existing national parks and the development of new national park areas. This Division is currently divided into four main sections each of which is headed by a principal officer. Thus the management and operations of the O Le Pupū Pu’e National Park is specified as a task to be implemented by the Forest Management Section of South Upolu.

Structure of the Forestry Division



SECTION 3: SUMMARY OF THE PARK

3.1 History

The Minister of the Department of Agriculture, Forests and Fisheries, together with two senior officers toured the State of California, USA in 1972 for the purpose of gaining first hand knowledge about national parks and reserve systems. A field visit to the “Yellowstone National Park” ignited ideas for the development of a national park in Samoa.

In 1974, a survey was conducted for the National Park area to mark its boundary.

In 1975, at the request of the Government of Western Samoa, a United Nations Development Advisory Team (UNDAT) prepared a plan for a national park system for Western Samoa (Holloway and Floyd, 1975 cited in Pearsall 1993).

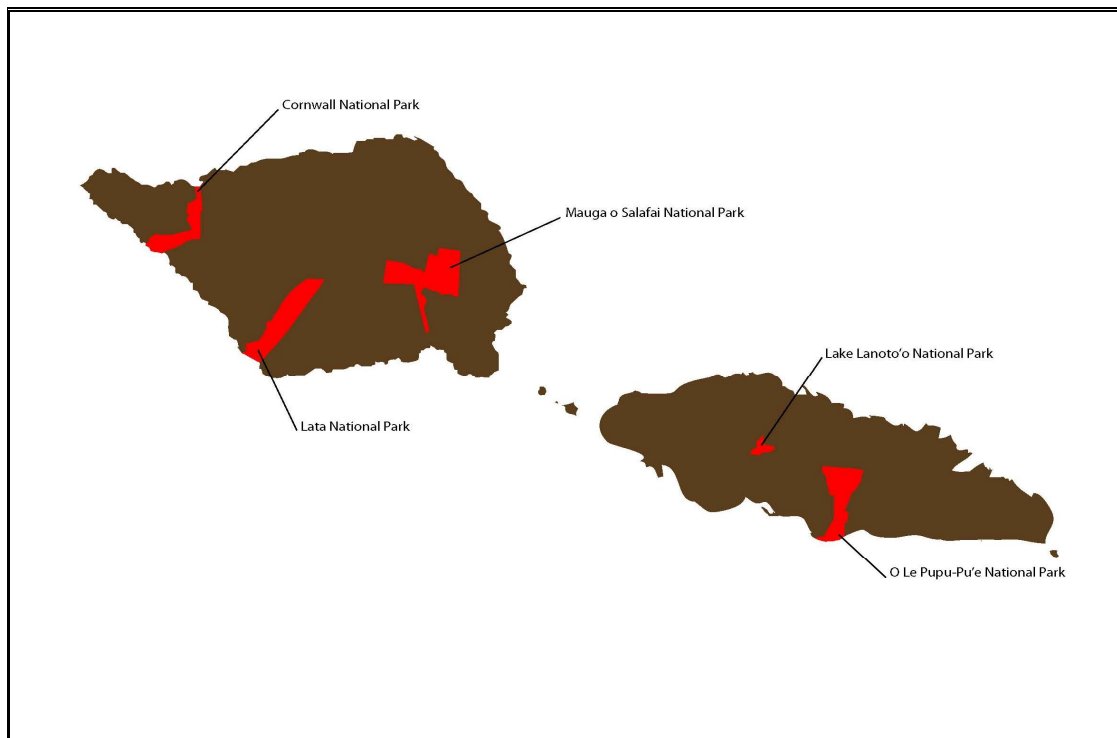
On 12th June 1976, the Government of Samoa signed the Convention on Conservation of Nature in the South Pacific (Apia Convention) 1976 with the understanding that Samoa's forest resources were depleting rapidly from logging, 'slash and burn' agriculture and natural disasters such as cyclones. Thus, as an obligation to the Convention, the Department of Agriculture, Forest and Fisheries developed the O Le Pupū Pu'e National Park according to the categories defined by the Convention.

In 1978 the area was officially declared as the first ever National Park in Samoa and the South Pacific region.

Before O Le Pupū Pu'e National Park was officially announced as a National Park some areas of the park had been logged by a businessman during the early 1950s - 60s.

In the 1980s, the government through the Forestry Division established the South Upolu station to develop a forestry plantation adjacent to the National Park with the assistance of the New Zealand Overseas Development Assistance (NZODA). This plantation area was added to the O Le Pupū Pu'e National Park in 2008.

3.2 Locations, Area and Boundary



O Le Pupū-Pu'e national park extends from the highest points on Upolu (Mt. Vaivai, 1158m), Mt. Fito³ (1,120m) and Mt. Pu'e (1020m) down to the rugged Le

³ In the current topographic map (Samoa-U2, 2000) one volcano outside the national park is named Mt. Fito however, according to the current conventional knowledge Mt. Fito is the volcano in the national park.

Pupū lava coastal cliffs. It is located on the southern part of Upolu Island, between the villages of Saaga, Siumu and Saleilua.

From Apia to the Park's Visitor Centre is a distance of about 28km south along Cross Island road, 5km east of Siumu junction.

The original area of O Le Pupū Pu'e National Park was about 4234 hectares (10,457 acres). However with the inclusion of the Forestry Plantation on the west coast side of the park (2008) and the recreational area, the Park increased to 5019 hectares (12,396 acres).

3.3 Visitors

The Park is accessible by public and private transportation from anywhere in Upolu Island, where nearly three quarters of Samoa's population live, and about an hour's drive from the capital city, Apia. Such a convenient location together with the outstanding natural beauty of the Park attracts many visitors. Based on the visitor survey conducted for two weeks in April 2007, an estimated 7,900 people are visiting Togitogiga Waterfalls Recreational area in the National Park annually. This recreational area is an equally popular destination for international tourists (3800) and locals (4100). The gender balance of visitors is 58% male and 42% female and the primary purpose of their visits are sightseeing and swimming.

3.4 Natural Environment

3.4.1 Geology, Landforms, Soils and Catchments:

About 3 million years ago, Samoa emerged from the sea as a chain of volcanic cones. These first volcanoes are known as the Fagaloa volcanics, which eroded and weathered, cutting gorges, reducing the size of the original cones and forming soil.

Around 100,000 years ago a new period of volcanic activity began called the Salani volcanics. Lava from the Salani volcanics, flowed over and covered much of the older Fagaloa volcanics. Mt. Le Pu'e located in the north-west corner of the Park, is a well preserved cinder gage of the Salani volcanics.

Around 3,000 years ago, the Pu'apu'a volcanics, which are the youngest found on Upolu, erupted from Mt. Fito sending a river of lava down the Lepala valley. As the lava reached the lowland area it spread into a massive sheet covering the older lava, filling in old lagoons and flowing over the coral coast well beyond the present coastline. The sea has since cut the rocks back to the present line. Due to the lava's relative recentness, very little weathering of the rock has occurred. This gives the O le Pupū area its characteristically rough look and poor soil formation (Ollier et.al.,1979).

Lava tubes are formed when hot liquid lava drains from beneath a cold, solid crust. A few lava tubes are found throughout the National Park and they vary in size, height and length. An excellent example of a lava tube is the Pe'ape'a Cave, which is located near the centre of the park.

Some parts of the O Le Pupū Pu'e National Park to the east have been identified as part of the Togitogiga Catchment that is managed by the Water Resources

Division of MNRE. The Togitogiga Watershed, which is located in the district of Falealili, covers approximately 1,580 hectares. The land tenure of the catchment consists of Government land on the western side of the catchment (towards Saaga village) and customary land on the eastern side (towards Saleilua village). The catchment also includes the Mataloa stream, which empties into the Iliili estuary situated on the eastern side of the National Park. The catchment is essential for the provision of water supply for nearby residents as well as providing recreational opportunities. It has a unique riparian ecosystem, biodiversity and environment.

Ten different soil types have been identified in the Park and only one of these types is suitable for sustainable agriculture, which is found in isolated patches. The rest of the soil types are not suited for development and in fact several soils are prone to erosion if the forest is cleared. Most of the soil in the Park is formed from weathered basalt. Some soil variation arises from slight differences in the chemical composition of basalt, the age of parent rock, the nature of base rock and leaching.

3.4.2 Flora

Before occupation by Polynesians, Samoa was covered by tropical forests, commonly known as “rainforest”. However, due to pressures from an expanding population most of the lowland forest on Upolu has been cleared for logging as well as for plantations, croplands and villages. Although a large area of degraded vegetation extends into the National Park, it still contains one of the best remaining areas of tropical forest found on Upolu.

Invasive species are one of the major threats to the biodiversity of Samoa as noted in the National Invasive Species Action Plan 2008 (NISAP) and the habitat of native plants has seriously decreased. The Park maintains large tracts of forest dominated by native plants. In the eighth permanent vegetation plots (2 ha in total) established by the MNRE-JICA project in 2008, a total of 273 plant species were recorded of which 251 species are native. The total number of native plant species recorded in the National Park since its establishment is 352. The total vascular plant flora native to Samoa archipelago is estimated to be 770, which means the Park contains at least 46% of the native species in the archipelago (Whistler 2008, page). The total surveyed area is a very tiny proportion (i.e. <0.1%) of the National Park, so a larger number of native plant species are likely to inhabit the Park.

The vegetation of the Park is well described in Ollier *et al.* (1979) and the following description is mostly extracted from this report.

Within the Park, the rainforest extends from the littoral forest on the O Le Pupū coast into the mountains. The forest is not uniform but varies in species composition related to change in elevation (which cause changes in rainfall and temperature) and differences in soil. The Park is unique in that it encompasses nearly the whole range of forest types found on Upolu. The different types of forest within the Park are described below.

Littoral Vegetation

The vegetation seen at the Coastal Walk (see Section 4.6) differs from that in any other area of the Park. It is referred to as “littoral” vegetation and is composed of species that grow only along tropical seashores. The plants found in

this area have the ability to adapt to harsh growing conditions such as barren rock without soil, salty sea winds, and occasional splashes of seawater. Dominant tree species are fasa (*Pandanus tectorius*), a monocot tree with stilt roots and fetau (*Calophyllum inophyllum*). In some places, fuefue moa (*Ipomoea pes-caprae*), a beach morning-glory vine with large showy lavender-color flowers and To'ito'i (*Scaevola taccada*), a spreading shrub with large waxy leaves and white flowers and fruit, are common ground covers.

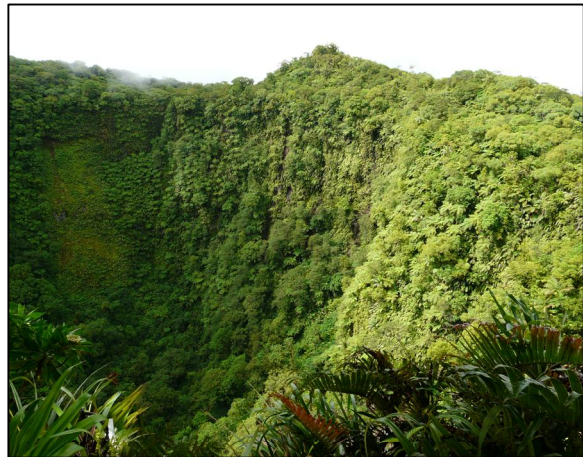
Forests of the Lowland

There are several different types of forests occurring in the lowlands of Samoa, but only the “tava lowland forest” is found within the Park. This forest, dominated by tava (*Pometia pinnata*) corresponds to the rocky Puapua lava flow covering the entire lower portion of the Park. Tava towers above the irregular canopy to a height of 30m or more. Also common but in smaller numbers are mamalava (*Planchonella torricellensis*), mamala (*Dysoxylum samoense*), malili (*Terminalia richii*), and tavai (*Rhus taitensis*). Also of interest is the native palm, niuvao (*Clinostigma warburgii*), which grows throughout the Park.

Forests of the Foothills and Valleys

Two main types of forests occur within the foothills and valleys of the Park. On the dissected foothills on the western edge of the Park is a forest referred to as “mafoa foothill forest”. It corresponds to an isolated area of eroded Fagaloa Volcanics, the oldest type found in Samoa. The dominant species is mafoa or lama palagi (*Canarium harveyi*), an introduced species and atone (*Myristica hypargyraea*) the big-leaf Samoan nutmeg.

On the intermediate-aged Salani lava flows, there is the “mamalava foothill forest”. The soil is moderately stony and is better for tree growths than either Puapua or Fagaloa.



Forests of the Highlands

In the Park, the highlands occur between 600-1100m elevations. This montane forest is sometimes called “cloud forest” because of the usual presence of clouds. The forest is always wet, allowing for a profusion of epiphytes. The tree trunks and the ground are covered with scores of species of ferns, mosses and orchids. The dominant species in this forest is maota mea (*Dysoxylum huntii*), a large important lumber tree. Also common in this forest are vivao (*Reynoldsia lanutoensis*), pipi (*Hernandia moerenhoutiana*), fogamamala (*Homalanthus acuminatus*) and many others. It is noted that a rare native niuvao (*Clinostigma samoense*) listed in the IUCN redlist is also found. This type of forest is probably richer in the number of plant species than any other in Samoa.

Vegetation of Montane Craters

Within the Park, several montane craters are found which possess unique wetland vegetation. Two of these are found in Mt. Pu'e (which is a double cone)

and a third is found at Vaivai. Around the edges of the lake is a crater marsh, usually dominated by 'utu'utu (*Eleocharis dulcis*), a leafless cylindrical sedge, and other aquatic herbs.

3.4.3 Fauna

As you travel from New Guinea eastward, the number of birds, mammal, and reptile species progressively decreases. Such is the case in Samoa with a small number of animal species. This lack of diversity is particularly offset by their special scientific interest, as many of Samoa's animals, especially the landbirds are found nowhere else in the world.

The Park is relatively abundant in wildlife. Found within the park boundaries are 51 species comprising of 42 birds, five mammals and four lizards. (Ollier, et.al., 1979).

Of the 51 species, 21 are unique because they are found nowhere else in the world but Samoa Islands. Of the 21 species, nine are found in both Western Samoa and American Samoa (endemic to Samoa archipelago) and twelve are restricted to Samoa. Furthermore, three species are only found on Upolu Island (O Le Pupū Pu'e National Park Management plan, 1981).

Birds

Forty two (42) bird species have been found within the park: seven (7) are classified as seabirds and 35 are classified as water-fowl, marsh, and land birds. (Ollier et. Al, 1979). O Le Pupū Pu'e National Park is one of few areas where the endangered Manumea (Tooth-billed Pigeon) (*Didunculus strigirostris*) and Ma'oma'o (Mao) (*Gymnomyza samoensis*) were recorded in the MNRE 2005-2006 survey though neither was recorded in a survey in November 2009 (Butler 2009).

A 6-day walk-through bird survey in 2009 covered many parts of the Park including the vicinity of seven recently established vegetation plots (Butler op. cit.). Twenty-five bird species were located comprising 21 landbirds and 4 seabirds. Ten species previously found in the Park were not located, which indicates that they are either rare or absent. These include the Manumea, Tuaimo (Friendly Ground Dove) (*Gallicolumba stairii*) and Tutulili (Island Thrush) (*Turdus poliocephalus*) all of which are a cause for concern. The survey also reinforced the idea that the Manuma/Manu'ulua (Many-coloured Fruit Dove) (*Ptilinopus perousii*), Segaula (Samoan Parrotfinch) (*Erythrura cyaneovirens*) and Fuia Vao (Polynesian Starling) (*Aplonis tabuensis*) may be in decline. On the positive side the introduced species of mynahs and bulbuls, were only found on the edges of the Park in highly modified habitats.

The 2009 survey did not undertake counts. Previous work by Schuster (Schuster et al. 1999) recorded higher numbers of birds in 1996 than in counts conducted after Cyclones Ofa (1990) and Val (1991) (Park, et. al 1992). Wetland species such as the purple swamp-hen, grey duck, white-browed rail and banded rail were all recorded at the craters in earlier surveys but only the duck was detected in 2009.

Mammals:

Previously, all of the three native species of mammals were known to exist in the park: Samoan flying fox (*Pteropus samoensis*), White-naped flying fox (*Pteropus tonganus*) and Sheath-Tailed Bat (*Emballonura semicuadata*). Sheath Tailed

Bats were known to breed in the Pe'ape'a cave which is located at the central part of the park (Ollier, et. al., 1979). However, the park saw a severe decline in the population of these mammals after the cyclones in 1990 and 1991, as well as possibly hunting. The 1996 survey (Schuster et al. 1999) recorded the only two flying foxes at mixed roosts within the park. The Sheath-Tailed Bat has not been sighted in the Pe'ape'a cave in recent years and may now be extinct in Samoa.

Introduced mammals recorded in the park include pigs, Polynesian rats, dogs and wild cats, mice, Ship and Norway-rats are also probably present.

Reptiles:

Four species of lizards have been recorded within the park: all skinks, and the Pacific Boa snake is also expected to be found. The skinks are the snake-eyed skink (*Cryptoblepharus boutonii*), azure-tailed skink (*Emoia cyanura*), Samoan skink (*Emoia samoensis*) and an unidentified species (*Emoia species*) (Ollier et al, 1979). The most common species is the azure tailed skink (*Emoia cyanura*), which prefers open areas with direct sunlight and is common along roads, trails, streams and cleared areas.

Insects:

An entomological survey in 1996 found twenty-four taxa of insects from eight families in disturbed montane forest in the park. (Schuster et. al, 1996). There are 28 species of butterfly known in Samoa and at least 15 species are expected or recorded in the Park (Edwards 2009). Hopkins (1927) named two Nymphalid butterflies from Upolu as endemic to Samoa. The *Phalanta exulans* is a vivid orange species with black wing veins and markings whereas the *Hypolimnias errabunda* is a large brown orange species. These beautiful endemic species were rediscovered in O Le Pupū Pu'e National Park as well as other lesser-disturbed forest area in Upolu and Savaii during the butterfly survey in 2008. The most common butterflies found in the Park include the Blue Tiger (*Tiramula hamata melittula*), Monarch (*Danaus plexippus*), and Crow Butterfly (*Euploea algae schmeltzi*).

Fish and Crustaceans:

Very little is known about the freshwater biodiversity of Samoa. A survey was conducted at Mataroa River in the Park in July 2008 as part of a nationwide preliminary survey (Jenkins et al. 2008). The survey at Mataroa River was conducted for a half day at Togitogiga Waterfalls area using electric fishing equipment. Only four fish species and two macro-crustacean species were recorded (Table 4.4.1). The survey was obviously not comprehensive enough because eels (*Anguillidae*) commonly seen at this river were not recorded. It was speculated that the biodiversity of the river was low for two possible reasons. One reason is that the mouth of Mataroa River is a cliff and no estuary is developed, which thus limits migratory species (at least 95% of the native species) to travel between sea and river. The other reason is that the river dries up several times during the year. (Refer Table 4.4.1 for results of survey)

Table 4.4.1: Survey of Fish and Crustacean Species Recorded at Togitogiga Waterfall.

Family	Genus	Species	Samoan Name
--------	-------	---------	-------------

Fishes			
Eleotridae	<i>Eleotris</i>	<i>fusca</i>	mano'o-pala, pa'ofa' apofu
Gobiidae	<i>Sicyopterus</i>	<i>lagocephalus</i>	No name
	<i>Sicyopterus</i>	<i>pugnans</i>	No name
	<i>Stiphodon</i>	<i>elegans</i>	mano'o-vai
Macro-crustaceans			
Atyidae	<i>Atyoida</i>	<i>pilipes</i>	ula vai
Palaemonidae	<i>Macrobrachium</i>	<i>lar</i>	ula vai

3.5 Cultural Heritage

A preliminary site visit reported at least two possible cultural sites in O Le Pupū Pu'e National Park (Jonsson and Tsutsumi, 2008).

The locally called site *Utū-uta-ma-utu-tai* or *Pa Toga* (literally means 'Tongan wall') is a wall made of soil and rock said that have been used during the war with the Tongans in earlier days. Located upland and overlooking the ocean south of Upolu, the wall seems to have functioned as a good defense. The wall is about two meters high, and starts with one end on the Mataroa River and the exact location of the other end is not known. The visible part of the wall is estimated to be about 300 meters long, but its actual length is also not known.

The mound is located near the visitor centre and it is easily accessible by foot. The mound is a possible equivalent of the *Ave Valu* (star mound), but the arms are not as distinctive as the star mound. It is believed that it has been used as a platform for snaring pigeons.

Other possible cultural sites, such as the *Ave Valu*, are reported to exist in areas adjacent to the park.

3.6 Visitor Attractions

Coastal Walk

The Coastal Walk is situated approximately 3km south of the Southern Coast Road and about 4.5km east of the junction with Cross Island Road. The access road from Southern Coast Road to Coastal Walk is not sealed and a 4WD vehicle is recommended. The car park was renovated and interpretive signs were installed in 2009.

The 900m Coastal Walk offers magnificent views of the coast on a lava flow. The site offers itself to some amazing interpretation of the geology and volcanic history of Samoa. Visitors can also enjoy extraordinary scenery and tropical littoral vegetation dominated by *Pandanus* trees.

The walk, which takes about 30 minutes, starts from the car park and ends at a headland or flat rock. There are, however inherent risks to the public in accessing the Coastal Walk. A large part of the trail is bare basalt



surface, which is uneven and very slippery when wet. A fall over the cliff would likely result in very serious injury or death at almost every location. Visitors must therefore wear appropriate footwear, exercise appropriate caution while walking and must not get too close to the cliff edge and blow holes.

Pe'ape'a Cave.



The cave, which is about 850m long, is situated near the north western edge of the Puapua lava field. The size of the cave is apparently about 10m wide and 8m high and it is dark for the most part.

Access to the cave is by foot track from the National Park Visitor Centre, a distance of about 3.5km. The walk takes about two to three hours over fairly rough track. There is also another access by foot from the nearest driving point (Livestock

farm), a walk of about 30 minutes through bush and along the Pola river bed. Entrance to the cave is through a collapsed section of the roof.

This cave is an interesting feature for the more adventurous visitors. Due to its difficult entrance, visitors are advised to be fully equipped with mountain climbing gears. The main constraint on visitors is the Afuiva River, which flows through it during periods of heavy rain. The force of this water, which fills the cave, prohibits any likelihood of providing facilities within the cave. It therefore, will always have to remain an



attraction for the hardier types. Adequate warnings should be given and groups are encouraged to be escorted by Park staff to ensure the welfare of the cave's wildlife and safety of the visitors themselves.

Togitogiga Waterfall Recreational Area.

The Togitogiga Waterfall is part of the Mataroa River that runs as a series of falls and pools into the National Park. It is about 5 minutes walk from the Visitor Centre heading north east. The waterfall runs heavily during rainy seasons and it dries up during the dry season.

Ma Tree Walk

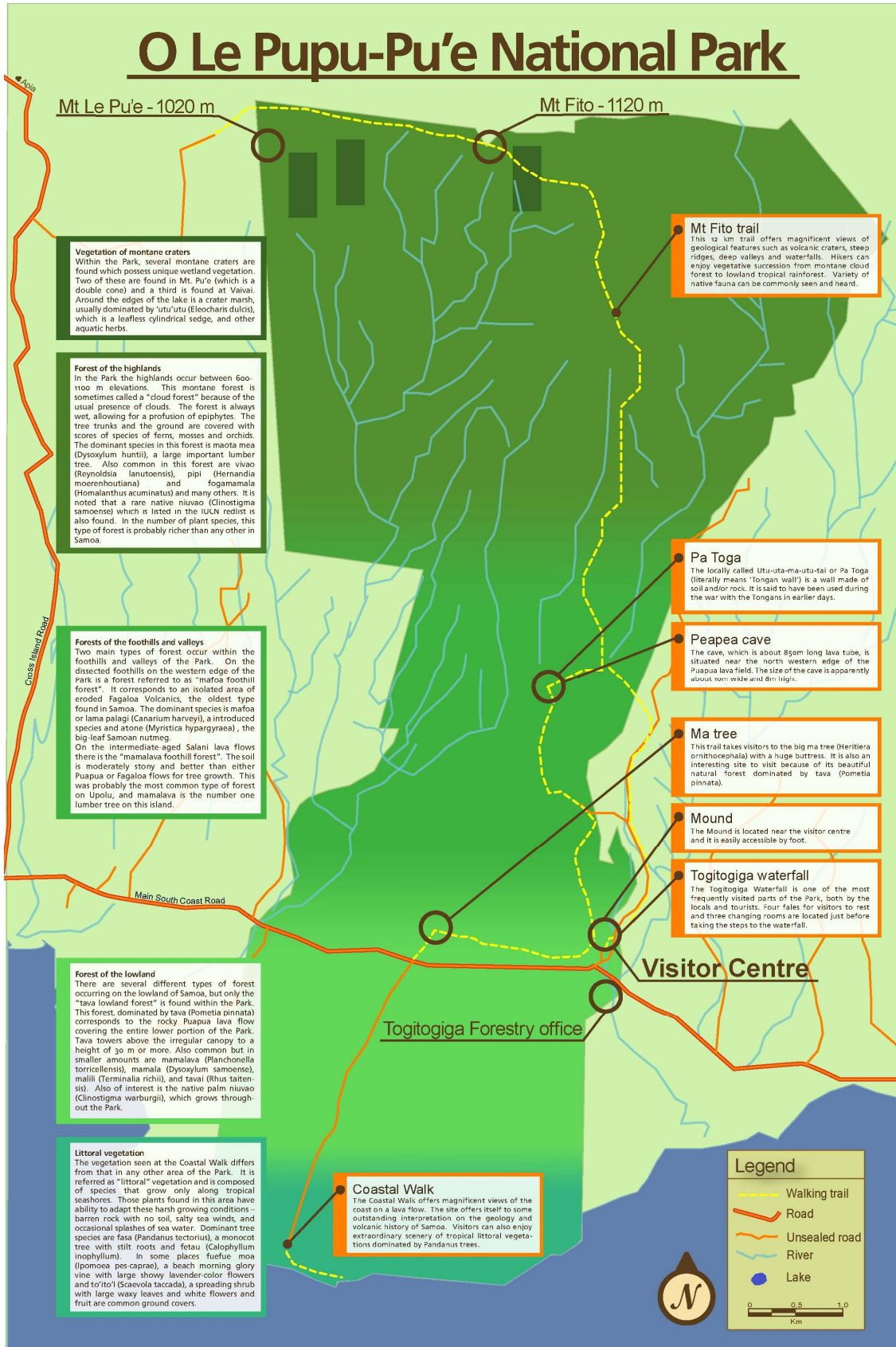
The Ma Tree Walk begins from the southern coast road and runs for about 700 meters north and takes about 30 minutes to complete. This trail takes visitors to the big ma tree (*Heritiera ornithocephala*) with a huge buttress. It is also an interesting site to visit because of its beautiful natural forest dominated by tava (*Pometia pinnata*).

Mt. Fito Trail

The access road to Mt. Fito Trail starts at the opposite side of Papapapai-uta (Tiavi) Waterfall lookout along Cross Island Road. The trail starts at the end of the access road (about 2.5 km from Cross Island Road), 860m above sea level west of Mt Pu'e (1020m). The trail runs north, across the slope of Mt. Pu'e, and passes through Mt. Vaivai (1158m), the highest peak in Upolu Island. It then, runs south across the slope of Mt. Fito (1120m) and descends a narrow ridge to Pe'ape'a Cave (250m) where hikers can choose to either continue walking to the National park Visitor Centre or take a short walk to Livestock station to the vehicle pick up place. This 12km trail provides magnificent views of geological features such as volcanic craters, steep ridges, deep valleys and waterfalls. Hikers can enjoy vegetative succession from montane cloud forest to lowland tropical rainforest. A variety of native flora and fauna can be commonly seen and heard.

An overnight trip will provide sufficient time for hikers to enjoy nature and the view. A day trip is also suitable but only for a fast walker. This trail is not suitable for casual hikers, but it certainly provides a challenge for the more serious and experienced hikers. Visitors are advised to contact the Forestry Division or the National Park Visitor Centre to collect updated information on trail conditions. Hiring local guides is strongly recommended since some trail sections may be difficult to identify. Guides and porters can be arranged at the National Park Visitor Center.

O Le Pupu-Pu'e National Park



SECTION 4: MANAGEMENT DIRECTION

Management Direction

O Le Pupū Pu'e National Park shall be primarily managed for the conservation of native flora and fauna as well as for its cultural and geological heritage. Management decisions shall be made in line with strict nature conservation as much as possible. Intervention with its biological, geological and cultural assets must be kept minimal, including infrastructure development. This primary management direction is based on Samoa's recognition of the park's local and global conservation significance. O Le Pupū Pu'e National Park contains most of the vegetation types on Upolu Island, with a wide range of coverage from the coast to the highest mountain areas in Upolu. With such diverse vegetation types and large land area, the park provides habitat to a wide range of fauna including the endangered Manumea (Tooth-billed Pigeon: *Didunculus strigirostris*) and Ma'oma'o (Mao: *Gymnomyza samoensis*). Hence, this Park, should be managed primarily to ensure that its long-term local and global environmental services are preserved.

At the same time, education and ecotourism must be encouraged in this Park. This is based on the fact that the park's outstanding geological features, together with its rich flora and fauna, provide excellent opportunities for the general public to learn and enjoy Samoa's unique nature. Proximity to surrounding local communities makes it vital to keep good relationships with the villages, which is another reason why education and awareness is important to this park.

Central Values

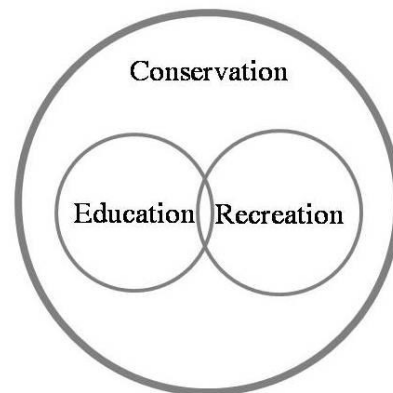
Values to be emphasised in O Le Pupū Pu'e National Park and the structure of these values are as follows:

Central Value: Conservation

Conservation of native flora and fauna as well as the cultural and geological heritage is the primary umbrella value.

Secondary Values: Education and Recreation

Education and Recreation serve as the composite values to the umbrella Conservation value.



SECTION 5: MANAGEMENT STRATEGIES

5.1 BOUNDARY:

Current Situation:

The boundary of O Le Pupū Pu'e National Park is clearly identified on the map and GIS data is also available. On the ground, cement pegs are planted at the west and east corners of the park near the South Coast Road to identify the boundary. The National Park shares a boundary with villages and several farms (cattle, agriculture, etc) owned by both government and locals. It is necessary to

install more permanent boundary marks on the ground, especially in areas where there is easy access and to inform the people where the boundary is, especially when land ownership is a very sensitive issue. The Forestry Division needs to work together with the Technical Division of MNRE, which is responsible for land planning and to conduct a survey that investigates encroachments across the Park boundary.

Management Goal: *to make sure that the boundary is consistently maintained from the impact of various activities that may alter its original coordinates.*

Management Actions:

- Coordinate and implement a survey to demarcate exact boundaries and area of the National Park
- Consult and provide advice to neighbouring villages and families informing them of the park boundary to prevent encroachment
- Monitor activities along the boundary to ensure that there is no impact imposed by neighbouring locals.
- Plant native tree species along the boundary to clearly indicate the location of the park
- Maintain proper management practices to control trespassing livestock into the National Park
- Collaborate with the Ministry of Agriculture and Fisheries and farmers

5.2 NATURE CONSERVATION:

Background and Current Situation:

Biodiversity

As described in Section 3, O Le Pupū Pu'e national Park holds a rich biodiversity of flora and fauna. Most vegetation types occurring in Upolu Island can be seen in the Park and a wide variety of native fauna including endangered species inhabit it. The Park is one of the largest key biodiversity areas in Upolu Island and effective biodiversity conservation in the Park is critical to management of biodiversity in the country.

Watershed Protection

Forests play an important role in watershed management. Soils in forested areas have large water holding capacity. After a heavy rain, forest soils hold large amounts of water and release it slowly to streams. Without forests, rivers tend to flow violently after rains and dry up quickly. Forests also prevent soil erosion. Without forests, eroded soils flow out to the sea and destroy reefs, and may affect the fisheries of the local communities. Forests in the Park contribute to maintaining the living standard of the people in communities in many ways such as the provision of a stable water supply, flood prevention and reef protection.

Climate Change

Climate changes and sea level rises are serious concerns given that 70% of Samoa's population and infrastructure are located on low-lying coastal areas. Samoa's economy largely depends on its natural resources, which in turn relies on favorable climatic conditions for growth and sustenance (MNRE 2005). As a result of climate change, more frequent extreme weather events are predicted and water resources are likely to be seriously compromised in Pacific countries according to the Intergovernmental Panel on Climate Change (IPCC 2007). Parks play an important role in mitigation and adaptation strategies as a consequence of climate change locally and regionally.

In mitigation efforts,

- The Park stores large amounts of carbon in the forests both above and below ground.

whereas in adaptation,

- Forests in the Park contribute to a stable water supply, flood prevention and soil erosion.
- Preservation of genetic resources.

Invasive Species and Ecological Restoration

Invasive species constitute one of the greatest threats to Samoa's natural heritage (Government of Samoa, 2008). Samoa's National Invasive Species Action Plan (NISAP) defines invasive species as follows:

“Invasive species are species introduced into an area in which they do not occur naturally, usually as a result of human activities, and which threaten environmental or economic resources, or human health, due to the damage they cause, or are likely to cause”

Forests in the Park were severely damaged by two consecutive cyclones (Cyclone Ofa in 1990 and Cyclone Valerie in 1991). Invasive plants spread vigorously in the destroyed forests. Alii o le po (*Cestrum nocturnum*), la'au lau mamoe (*Clidemia hirta*) and Lantana (*Lantana camara*) are invasive shrubs growing densely in the degraded montane forests. A large area at lower altitude (< 500~600m) in the Park is heavily affected by *Merremia peltata* vine. Invasive tree species such as tamaligi (*Falcataria molcana*, *Albizia chinensis*), pulu mamoe (*Castilla elastica*), pulu vao (*Funtumia elastica*) and fa'apasi (*Spathodea campanulata*) are also widespread in the Park. The precise status of invasive species in the Park is not known and investigation is needed.

Tree planting has been implemented in areas affected by *Merremia* vine since 2007. Only tree species considered native to the Park have been planted. The objective of the planting is to control the invasive vines and to restore the original forest cover.

Management Goal: *to protect the natural biological diversity and landscapes of the park, coordinate and implement ecological restoration activities for degraded areas and minimize soil loss and erosion*

Management Actions:

- Prepare an ecological restoration plan for the Park

- Implement ecological restoration activities for degraded areas of the Park
- Coordinate and implement programs to protect the Park’s wildlife
- Conduct and promote research and monitoring of the biological diversity of the Park to provide updated information
- Raise awareness on threats to the park’s biodiversity and the importance of nature conservation.

5.3 ZONING:

Current Situation:

A zoning system is now introduced which divides the National Park area into two comprehensive zones; Conservation Zone and Utilization Zone. This division separates the functions of these important areas. The Conservation Zone focuses on the conservation of the natural ecosystems of the park. The Utilization Zone serves the public’s leisure and nature viewing needs and provides facilities for park management and serving the neighbouring communities.

Conservation Zone

This zone covers most of the Park areas and people are allowed to visit.

Necessary restrictions are applied and are discussed in the following subsection. However, the purpose of defining this area is to maintain the natural resources and landscape of the park and to restore the ecology of the degraded areas such as in the lowlands.

Utilization Zone

This zone covers (1% of the park) the Togitogiga Waterfall recreational area, Visitor Centre, all car parks, the Forestry Compound and Nursery, comprising a width of 10metres on both sides of the road and the water reservoir. The zone is open to visitors for sightseeing. Some minor infrastructure for managing the park and also for serving neighbouring communities can be installed in this zone after careful environmental impact assessments have been carried out.

Table 5.1: Descriptions of the two management zones

Conservation Zone (99%)	Utilization Zone (1%)
<p>Only plant species, which are considered native to the area, is used for ecological restoration. (Species native to Samoa but not for the particular area should not be used. <i>e.g Intsia bijuga</i>)</p> <p>Necessary minimum facilities for serving visitors to be installed (e.g. trails, campsite, toilets and view</p>	<p>Ornamental and exotic plants can be planted. Species listed in the National Invasive Species Action Plan are not allowed to be planted.</p> <p>Appropriate and necessary facilities for serving visitors are installed (e.g. visitors centre, car park, picnic/barbecue facility, play ground, shops)</p>

platforms)	Facilities not serving park visitors but necessary for maintaining living conditions of neighboring communities (e.g. water intake system) may be installed after careful environment impact assessment (EIA) and agreement by the government
------------	---

Management Goal: *to ensure that the zoning systems differentiate the Conservation and Utilization zones according to their purposes with their functions to be conservative and manageable.*

Management Actions:

- Conduct ground survey to identify the boundaries of the two different zones and to map these zones
- Carry out monitoring and maintenance of the zones where necessary

5.4 OFFENCES AND ENFORCEMENT

Current Situation:

The 2009 Socio-economic/Awareness Survey found that the majority (81.6%) of respondents from neighbouring communities claimed to have knowledge of park legislations and regulations. However, the extent and actual understanding of this knowledge is not confirmed. The survey also reported the existence of some unlawful activities in the park: that 4.9% of the respondents utilize the park for edible crops such as taro, yams, luau etc., and 5.4% reported hunting pigs, and birds as well as fishing the rivers. (Sesega, 2009).

The Lands, Survey and Environment Act 1989 (LSE) and the Parks and Reserves Act 1974 enforce the protection and conservation of protected areas, and such legislation emphasizes the powers of a Conservation Officer to enforce these laws and to prosecute law breakers. However, it is apparent that, these legislations are not enforced at its maximum level.

The relevant extracts from the LSE Act 1989, Division 3 in the matter of appointment and functions of a Conservation Officer state:

Section 106: Appointment of Conservation Officers - (1) The Director may, with the approval of the Minister, appoint officers or employees of the Department to be called Conservation Officers.

(2) The Director shall, by virtue of his appointment, be deemed to be a Conservation Officer.

(3) Every police officer shall, by virtue of his office, have all the powers of a Conservation Officer under this Act.

(4) The Director shall cause to be issued to each Conservation Officer, other than a police officer, an identity card in such form as the Director thinks fit, containing a photograph of the holder.

(5) Any person who ceases to be a Conservation Officer shall forthwith return his identity card to the Director.

Section 108: Arrest by Conservation Officer - (1) Any Conservation officer may, without warrant, in the presence of a police officer, arrest any person whom he reasonably believes to have committed an offence against this Act, or regulations made under this Act, being an offence which is punishable by imprisonment. (2) Before arresting any person under subsection (1) of this section, the Conservation Officer shall produce and show his identity card to the person being arrested.

(3) Any person arrested under subsection (1) of this section, shall be brought before a Court as soon as practicable after his arrest, to be dealt with in accordance with the law.

Section 110: Additional Powers of Conservation Officer - (1) A Conservation Officer may, in a national park, or other protected area, on producing his identity card issued under section 106 of this Act:

(a) Order a person whom he finds committing or whom he suspects of having committed an offence against this Act or any regulations under this Act, to disclose his full name and place of residence;

(b) Order a person whom he finds committing or whom he suspects of having committed an offence against this Act or any regulations under this Act, to leave forthwith that national park or protected area; and

(c) Order any person whom he reasonably suspects of having done an act in respect of which the person is required to hold a licence, permit, or other authority under this Act to produce such a licence, permit or evidence of such an authority.

(2) Every person who fails to comply with an order lawfully given under this section, commits an offence and upon conviction is liable to a fine of \$100 or imprisonment for a term not exceeding one month or to both.

Section 144: Offences - Except where otherwise provided in this Act, every person who commits an offence against this Act is liable on summary conviction to a fine not exceeding \$500 or to imprisonment for any term not exceeding one year, and, where the offence is a continuing one, to a further fine not exceeding \$10 for every day during which the offence continues.

The Parks and Reserves Act 1974 under Section 12, discusses offences which states that;

(1) Every person commits an offence against this Act who:

(a) causes or allows any domestic animal to trespass in a national park or reserve; or

(b) willfully contravenes any prohibition or restriction imposed under this Act by notice in the *Gazette* and the *Savali* by the Minister in respect of any national park or reserve; or

(c) without the authorization of the Minister, willfully alters, damages, destroys, removes or interferes with any natural feature or flora, in any national park; or

- (d) without the authorization of the Minister, willfully damages, destroys, removes, defaces or interferes with any building, erections, fence sign, or notice in a national park or reserve; or
 - (e) without the authorization of the Minister, deposits or throws any rubbish, or any article or substance of a dangerous or offensive nature, in a national park or reserve, except in a place or receptacle approved or provided by the Department of Lands and Survey for the purpose.
- (2) Every person who commits an offence against this Act, or against any regulations made under this Act, is liable on conviction to imprisonment for a term not exceeding 3 months or to a fine not exceeding \$500, or to both.

Management Goal: *to effectively enforce the existing legislation aimed at the protection and conservation of biodiversity of the O Le Pupū Pu'e National Park*

Management Actions:

- Raise public awareness and continue dialogue with communities and relevant stakeholders about national park provisions.
- Prepare and disseminate information to visitors about national park legislation in forms of brochures, information sheets, posters, etc.
- Prosecute offenders of the law.

5.5 FEES

Current Situation:

National Parks and Reserves Act 1974 stated that –

11. Regulations - The Head of State, acting on the advice of Cabinet, may from time to time by Order make regulations for all or any of the following purposes:

- (a) Imposing fees for admission to any national park or reserve;

Currently no entrance fees or facility fees are charged to park users and MNRE have financial constraints to maintain the park to a satisfactory level. According to results of a visitor survey in 2008, 45% of visitors are willing to pay a fee if appropriate services and well-maintained facilities are provided. However the introduction of any fee must be considered carefully so that it does not negatively affect visitors' interest in the park, and especially local visitors.

Management Goal: *maintain park facilities and provide appropriate services to the park users in an economically sustainable manner.*

Management Actions:

- Conduct a cost analysis for park management.

- Investigate appropriate systems to generate income to partly mitigate park management costs such as admission fee, or a service fee for using barbecue facilities and organized tours etc.

5.6 TRAILS

Current Situation:

There are four major trails (Coastal Walk, Ma Tree Walk, Pe’ape’a Cave Trail and Mt.Fito Trail) in the National Park. The four trails cover most elevations and major features in the National Park. A large area still remains inaccessible, however with the current number of visitors and demand, the four existing trails are considered to be sufficient. However, the maintenance and upgrading of the existing trails should be prioritized rather than opening new trails. The details for setting up and the maintenance of trails are covered in “Track Construction and Maintenance Guidelines” provided by the New Zealand Department of Conservation (2008) seem applicable with some local modification.

Coastal Walk

Despite the trail providing a pleasant walk with magnificent views and excellent educational opportunities to learn the geological history of Samoa, still a very limited number of people visit the site. The primary limiting factor appears to be the rough surface of the access road. Improving the road to allow access for 2-wheel drive vehicles need to be considered.

The walk is short (1.8 km return) and mostly flat. The trail should be upgraded and maintained to accommodate family hikers and a larger number of visitors. It should be well defined so that inexperienced users can easily find their way in both directions. The width of the trail should be between 0.75-1.5 m. The walking surface should be as even as possible and provide safe footing. Installation of boardwalks on slippery sections might be considered once the access road is improved and the number of visitors increased.

Ma Tree Walk

This is another short walk in the National Park in which the trail should be upgraded and maintained to the same standard as the coastal walk.

Mt. Fito Trail

The 12 km trail from Mt. Pu’e to Pe’ape’a Cave through Mt. Fito was opened in 2008 under the MNRE-JICA project. The primary purpose of the trail is to provide access to permanent vegetation plots, which monitor native forest dynamics in Samoa, and not for the general public although it has evident potential for use by visitors. A group of experts in various fields such as environmental management and tourism were invited to walk the trail with the aim of assessing its potential for public use in May 2009. They concluded “the trail is easy to access from Apia and passes through some of the most interesting scenery in Samoa. There is great potential for this trail to generate a reasonable and sustainable income for the Park while offering a unique natural history experience for visitors and locals alike that is not currently available in Samoa (Atherton *et al.* 2009)”.

However there are some problems that need to be solved before promoting the trail to the general public. The access road does not reach the National Park boundary. The trail currently passes through leasehold land and there is no place for establishing a car park. It is therefore necessary to discuss the matter with the Land Management Division, to conduct ground demarcation and to identify the most suitable sites for a car park and other facilities. In addition there is also the need to reroute the trail in accordance with the confirmed land plan. There is a land dispute around the area and the access road is sometimes blocked by people who claim ownership to this part of the park. This problem also needs to be solved before the installation of necessary facilities and promoting the trail publicly.

Pe'ape'a Cave Trail

This trail provides a walking access from the National Park Visitor Centre to Pe'ape'a Cave. Due to the long distance of the trail (7 km return), the user is likely to be more adventurous and have had some degree of experience in walking a track of this type. However, visitors are seeking a low risk activity and this may appeal to a wider age range of users. The trail should be upgraded and maintained as the walking surface is between 0.3-1.0 m in width. The surface should be even for 75% of the walk while the remaining 25% can be of a rougher nature provided the footing is safe. Marking of the track needs improvement particularly where it crosses open grassy areas.

There is another access walkway that travels from the cattle farm to the cave, which takes a shorter time to reach. However, there should be an agreement or negotiations between the Ministry of Agriculture and Fisheries and the Ministry of Natural Resource and Environment to allow the main entrance gate to the cattle farm to be opened at any time for visitors to access the route to the cave.

Management Goal: *to ensure that all Park trails are maintained and monitored for the safety and enjoyment of the visitors*

Management Actions:

- Monitor and maintain trails from time to time
- Provide proper services for visitors such as organizing tours and arranging tour guides
- Conduct trainings for tour guides and promote eco-tourism in the National Park.
- Provide trail information to visitors as a leaflet or brochure with images of the different trails for easy guidance.
- Install signage on sites for safe direction of visitors

5.7 TOGITOGIGA WATERFALL RECREATIONAL AREA

Current Situation:

Facilities

The Togitogiga Waterfall is one of the most frequently visited areas of the Park, both by locals and tourists. Basic facilities are available: four fales for visitors to rest and three changing rooms located just before the steps to the waterfall. However, camping facilities are not available so visitors interested in camping are advised to contact the Forestry Division for arrangements.

Water flow

The water flow in the Mataroa River that runs into the Togitogiga Waterfall recreational area fluctuates very much throughout the year, and sometimes the waterfall dries out. This is a major concern as the waterfall is one of the popular tourist attractions in the Park. The Water Resource Division is collecting data on waterfall quality and flow and the proposed Togitogiga Watershed Management Project is expected to start in 2010.

Continued land clearance for cattle farming, agriculture and land development for residential and business purposes affect the natural ecosystem of the Togitogiga catchment which also affect its water quality and quantity. Poor cattle farming and agricultural practices in the catchment area have led to fresh and coastal water pollution and soil erosion. During the wet season from October to March, this area is prone to flooding and experiences poor water quality. During the dry season (April to September), low river/stream flows and water shortages occur regularly and are particularly heightened during droughts. These irregularities are likely to be exacerbated by the effects of climate change.

Management Goal: to ensure that the Togitogiga Waterfall Recreational area and facilities are to be maintained and monitored for the safety and enjoyment of visitors

Management Actions:

- Monitor and maintain the recreational and resting facilities (Forestry Division responsibility)
- Supervise the visitors and make sure that they comply with the regulations of the park (FD responsibility)
- Install signage and safety instructions (FD. responsibility)
- Monitor the water level of the Mataroa river and conduct watershed management activities (Water Resource Division and FD responsibility)

5.8 VISITOR CENTRE

Current Situation:

The Visitor Center was first built in the 1980's and was destroyed by cyclones in the early 90's. This resulted in one of the houses for the staff being used to serve as the Visitor



Centre since then. In 2008, the building was renovated and re-opened. The Visitor Centre focuses on two main objectives: firstly, to serve visitors by providing basic recreational information, and secondly to serve the general public by providing awareness material. Currently awareness displays and information materials in the centre are limited. There are no regular guided tours operating, but a guided hike on the Mt. Fito trail can be arranged upon request. One officer is assigned to be responsible for the management of the Visitor Centre.

Management Goals: *1) to serve recreational needs of visitors through providing information about the park, precautionary issues, and arranging guided tours. 2) to serve educational needs of the general public through providing awareness information on O Le Pupū Pu'e National Park.*

Management Actions:

- provide basic information and materials (brochures, maps etc.) for visitors, monitor these materials regularly and to provide supplemental materials as needed
- inform visitors about the park regulations
- organize a guided tour upon request
- monitor and maintain the Visitor Centre facilities from time to time (clean the facilities etc) and ensure that the needs of the visitors are well met
- collect and compile comments/suggestions/recommendations from the visitors about the park to further improve the park's operations
- analyze feedback from visitors by way of written comments and suggestions and to consider the feasibility of hiring camping gear and the sale of water, postcards, books etc.
- create more awareness displays to cover a wider range of biodiversity as well as the culture, and geology whilst also encouraging community involvement

5.9 CULTURAL HERITAGE:

Current Situation:

Limited information has been gathered regarding the existing cultural heritage sites within the park, and little interest has been shown in the management of these sites. However, recent visits to archaeological site recognize the potential significance of these sites so management should be in place to protect them from being destroyed.

Management Goals: *1) to identify the significance of cultural sites that are within O Le Pupū Pu'e National Park; 2) to protect the cultural sites; 3) to raise awareness of these cultural sites.*

Management Actions:

- conduct an archaeological survey and map each site

- establish national park rules concerning these sites where necessary.
- install signage explaining the rules as well as the historical importance of these sites

5.10 RECREATIONAL ACTIVITIES

Current Situation:

The park offers a variety of recreational opportunities that include hiking, swimming and bird watching. The park's existing trails present a wide range of ecological and geological features, from lowland coastal forest and lava rocks to upland rainforest and caves (refer to section 3.6 Tourist Attractions for details).

Basic facilities such as resting fales, toilets, changing rooms, car parks and trails are available, however improvement of the facilities for serving people is necessary to accommodate more local and international visitors. Some areas of the park (i.e. Pe'aPe'a cave, Coastal Walk etc.) need attention to safety measures.

The current practices with most recreational activities are self-guided. Assistance for recreational activities are limited to basic guidance at the Visitor Centre, but special arrangements can be made upon request for camping and guided tours, especially on the Mt. Fito trail.

Most visitors go to Togitogiga waterfalls for swimming and picnics, and a few might opt to visit other areas of the park. One reason for the lack of interest must be that other areas of attraction are not well known to visitors.. At the moment, visitor brochures on O Le Pupū Pu'e National Park are not widely distributed and most tourist guidebooks do not give full details on recreational opportunities available in O Le Pupū Pu'e National Park. A series of consultations with surrounding communities conducted in 2007-2009 show that not many neighbouring communities have actually visited the park.

Fortunately there has been no apparent major impact of harmful recreational activities on the natural surroundings of the park.

Management Goal: to ensure that assistance is provided for visitors to enjoy the beauty of natural surroundings in an ecologically friendly manner, and to make their visits to the park interesting and valuable.

Management Actions:

- maintain and improve recreational facilities (i.e. resting fales, toilets, changing rooms, car parks and trails)
- give safety talks to visitors (i.e. hikers must be accompanied by a guide on the Mt. Fito trail etc.) and install safety signage where necessary
- take measures to promote awareness of various places of interest within the park, including the following;
 - provide O Le Pupū Pu'e National Park brochures at the Visitor's centre at Samoa Tourism Authority in Apia

- provide updated information in tourist guidebooks
- conduct promotional campaigns (i.e. visits O Le Pupū Pu'e National Park Campaign)
- monitor the impact of recreational activities on the surrounding environment from time to time

5.11 AWARENESS ACTIVITIES

Current Situation:

The 2009 socioeconomic/awareness survey, together with feedback questionnaires from various educational programmes implemented during 2008-2009, suggest that O Le Pupū Pu'e National Park is well known to the general public (especially its Togitogiga waterfalls) even though many people have not actually visited the park.

The awareness of the general public about environmental issues surrounding the National Park is limited. Despite the fact that environmental issues are covered in formal education and that O Le Pupū Pu'e National Park is the oldest and among the largest of National Parks in the country, detailed information on the park is not evident amongst the public. Not many know the history of the park, or its geological, biological and cultural importance, the many recreational opportunities the park can offer, threats to conservation, and ways the general public can contribute to conservation efforts.

Although the attitude of the general public seems supportive of conservation and people are keen to learn about nature,, it is not known whether this attitude is reflected in actual behavior.. In general, the public seems to be interested in and supportive of O Le Pupū Pu'e National Park, but the motivation and opportunity to visit seem lacking.

A basic brochure exists but some of the content is out of date. This brochure is currently not made available to a wider range of the general public unless they come in contact with the Forestry Division or visit the Visitor Centre at the Park.

Several awareness materials have been developed, including butterfly brochures and education workbooks. Some are in the process of development, such as freshwater biodiversity posters, butterfly posters and so on. Basic awareness displays are available at the Visitor Centre at the Park. Information panels and signage are also currently being developed.

Several educational activities have been implemented, including public tree planting, workshops and education tours for schools.

Management Goal: to increase public awareness and understanding of the importance of the National Park

Management Actions:

- Ensure that basic information on the park is available to the general public, which includes;

- updating the current O Le Pupū Pu'e National Park brochure and making it available to the general public at all times (i.e. have enough supply at the Visitor Centre, the Forestry offices, DBS building, STA information fale, etc.).
- broadcasting awareness information through the media (TV, radio, newspapers etc.) at regular intervals.
- checking regularly on existing education materials, that the content is correct and updated as well as having enough supply at all times for distribution to schools and the general public.
- continuing the development of other education materials, including posters, brochures, workbooks, signage, information panels, and displays at the Visitor Centre.
- Continue and expand existing educational activities (i.e. public tree planting, workshops and education tours for schools) and to consider targeting a wider range of the public, by inviting neighboring communities to education tours.
- conduct 'Visit O Le Pupū Pu'e Campaign' to promote more interest and motivation for the general public to visit the park.

5.12 RELATIONSHIP WITH NEIGHBOURING COMMUNITIES

Current Situation:

The 2009 socioeconomic/awareness survey found that the surrounding communities of O Le Pupū Pu'e National Park are basically supportive of the park. Although some conflicting activities do exist such as planting farm products in the park, fortunately they are not on a major scale (Sesega, 2009).

The 'O Le Pupū Pu'e National Park Local Committee' was established in 2008, the objective being to strengthen the partnership between MNRE and the surrounding communities. The committee members consist of representatives from the surrounding villages of Saaga, Saleilua and Poutasi. The terms of reference have been set out to define the supporting roles of the Local Committee to the management of the park. Currently, regular committee meetings are held, and several community activities have been implemented including tree planting, community signage and community gardening projects.

Community involvement is limited and on a small-scale, targeting certain members of the communities under the guidance of the Local Committee, but there is ample opportunity for the committee to further extend its activities to reach a wider range of communities in the future.

Management Goal: to strengthen relationship with neighboring communities ensuring that their support is given to all management activities in the park

Management Actions:

- continue liaising with the O Le Pupū Pu'e National Park Local Committee and provide support where necessary

- consider formalizing the relationship between neighboring communities and MNRE under a 'Letter Of Agreement' through the Local Committee
- discuss solutions for conflicting activities (i.e. forming activities in the park) with the Local Committee which includes:
 - sharing and understanding the roles of the National Park
 - open discussion that favours a win-win situation, including re-definition of law enforcement and involvement of communities in the management of the Visitor Centre (shops, community guides, etc.)
- plan and implement community activities with the Local Committee
- encourage Local Committee and MNRE collaboration, to set out a target time frame to begin community activities that will include a wider range of people at all levels such as joint outreach programmes at grass root level.

5.13 RESEARCH ACTIVITIES

Current Situation:

The purpose of scientific studies in the Park is to improve understanding of its natural and cultural heritage and the processes that affect them. It is noted that additional information about the Park increases the conservation values of the Park. Research will also establish the requirements for the management of particular species and data findings from these studies and surveys will be utilized in park management. Knowledge about the natural environment in the Park is still very limited and often out of date, so regular monitoring and research by the Division of Forestry is encouraged. In addition, it is necessary to encourage and assist national and international research institutes to conduct studies in the Park since resources are often limited in the division.

Management Goal: to improve understanding of the Park's natural and cultural heritage to conduct appropriate management of the Park.

Management Actions:

- conduct research and surveys.
- seek opportunities for collaboration with national and international research institutes.
- encourage and assist national and international institutes to conduct research work in the Park.
- construct a database of research activities conducted in the Park and their results.

5.14 FORESTRY OFFICE AND NURSERY

Current Situation:

Forestry Office

The Togitogiga Forestry Office compound consists of an office, nursery and a few old accommodation buildings reserved for staff working in the area. This office is currently overseen by a Senior Officer and supports a number of officers and casual workers to implement forestry activities for the communities of the South Upolu region. Improved maintenance of the compound facilities are to be considered for proper operation of the station's work, particularly in serving visitors' needs at the National Park.

Nursery

The nursery is operated and maintained to ensure adequate supplies of seedlings for the ecological restoration and community forestry programmes.

There are various operations conducted within the nursery, including soil collection and sieving, potting, seed sowing and germination, transplanting and other activities to raise seedlings. Seedlings are distributed to local farmers under the community forestry programmes. With the inclusion of responsibility for the National Park under the Forestry Division, this nursery is now responsible for providing seedlings for ecological restoration activities.

Management Goals:

Forestry Office: *to provide overall management of O Le Pupū Pu'e National Park*

Nursery *to supply seedlings for the ecological restoration programme of O Le Pupū Pu'e National Park*

Management Actions:

Forestry Office

- to organize maintenance of the park
- to organize service for visitors
- to plan and implement ecological restoration
- to monitor operations of the park

Nursery

- maintain nursery compound
- carry out seed collection, wildings collection and raise
- supply seedlings for the National Park's restoration program when needed
- carry out monthly inventory checks particularly of equipment for maintaining and operating the nursery.

REFERENCES

- Butler, D.J. 2009, *Preliminary Bird Survey of O Le Pupū Pu'e National Park*.
Unpublished report to Forestry Division, November 10-17
- RA Mittermeier et. al., 2004, *Hotspots Revisited*, CEMEX, Mexico City, Mexico.
- Dahl, A. L. (1980) *Regional Ecosystems Survey of the South Pacific Area*, South Pacific Commission Technical Paper, Noumea, New Caledonia.
- Division of Environment and Conservation, 1998, *National Report to the Convention on Biological Diversity*, Government of Samoa, Samoa.
- Dudley, N. 2008, *Guidelines for Applying Protected Area Management Categories*, Gland, Switzerland.
- Edwards, E.2008, *Butterfly Investigation of O Le Pupū-Pu'e and Mt. Vaea Protected Areas: Building Samoa's Management Capacity, Creating Public Awareness and Conservation Opportunities*,
- Floyd and Holloway, 1974, 'A National Park System for Western Samoa' In Pearsall, S. 1993, *Terrestrial Coastal Environmental and Tourism in Western Samoa*, Kluwer Academic Publishers, Netherlands.
- Government of Samoa. 2008. *Samoa's National Invasive Species Action Plan*, Apia, Samoa.
- Intergovernmental Panel on Climate Change, 2007, *Climate Change 2007*. Cambridge University Press, USA.
- International Union for Conservation of Nature, 1994, *Guidelines for Protected Area Management Categories*, Gland, Switzerland and Cambridge, UK.
- Jenkins, A.P., Keith, P., Marquet, G. and Mailautoka, K.K. 2008, *A Preliminary Survey of Samoan Freshwater Macro-faunal Biodiversity*. Wetlands International-Oceania & Paris Museum of Natural History.
- Jonsson, M. and Tsutsumi, S. 2008 *Summary on Archeological Site Visit at O Le Pupū Pu'e National Park*, MNRE-JICA, Apia, Samoa.
- Ministry of Natural Resources and Environment, 2005, *National Adaptation Programme of Action*, Government of Samoa, Apia, Samoa.
- Ministry of Natural Resources and Environment, 2006, *Recovery Plan for the Ma'oma'o or Mao (Gymnomyza samoensis)* Government of Samoa, Apia, Samoa.

- Ministry of Natural Resources and Environment, 2006, *Recovery Plan for the Manumea or Tooth-billed pigeon (Didunculus strigirostris)*, Apia, Samoa.
- Ministry of Natural Resources and Environment, 2008, *Ministry of Natural Resources and Environment Corporate Plan (2008 – 2011)*, Government of Samoa, Apia, Samoa.
- Ollier, C.D., Whistler, W.A. and Amerson Jnr, A.B. 1979, *O le Pupu-Pu'e National Park, Samoa: Volume I – Main Report*, United Nations Development Advisory Team for the Pacific, Suva, Fiji.
- Park, G., Hay, R., Whistler, A., and Lovegrove, T. 1992, *The National Ecological Survey of Western Samoa. The Conservation of Biological Diversity in the Coastal Lowlands of Western Samoa*. Department of Conservation, Wellington, New Zealand.
- Pearsall, S. 1993, 'Terrestrial Coastal Environments and Tourism in Western Samoa' In P.P. Wong (ed), *Tourism vs. Environment: The Case for Coastal Areas*, Kluwer Academic Publishers, Netherlands, pp 33 - 54
- Schuster C., Whistler, A., Tuaillemafua, T.S. and Butler D. 1999, *National Ecological Survey of Upland Forest Ecosystems of Samoa*.
- Sesega, S. 2009, *Social Economic and Awareness Study of Local Communities Neighbouring the O Le Pupu Pu'e National Park and Vailima National Reserve Final Report*, unpublished.
- Whistler, A. 2004, *Rainforest Trees of Samoa*, Isle Botanical, USA.
- Whistler, A. 2008, *Final Report: Vegetation Survey of O Le Pupū Pu'e National Park*, unpublished.