



Ministry of Natural Resources and Environment

# Management Plan for Upland Areas of Lake Lanoto'o National Park

2018 - 2023





Cover photo: Lake Lanotoo © Stuart Chape

© MNRE 2018

This work is copyright. Apart from any use, no part may be reproduced by any process without prior written permission from the Ministry of Natural Resources and Environment. Produced by the Ministry of Natural Resources and Environment. Requests and enquiries concerning the contents of the report should be addressed to:

Ministry of Natural Resources and Environment (MNRE)  
Private Bag  
Level 3, Tuiatua Tupua Tamasese Efi Building  
Beach Road, Apia  
Samoa  
Telephone: +685 67200  
Fax: +685 23176  
Email: [info@mnre.gov.ws](mailto:info@mnre.gov.ws)

This report is also accessible from the MNRE's website:  
[www.mnre.gov.ws](http://www.mnre.gov.ws).

Funded under the UNDP/GEF Integration of Climate Change Risk and Resilience of Samoa's Forests (ICCRIFS) project of the Forestry Division, Ministry of Natural Resources and Environment.

# **Management Plan for Upland Areas of Lake Lanoto'o National Park, Samoa**

---

**9 February 2018**

Prepared for

**The Ministry of Natural Resources and Environment in Samoa**

By

**Terry Hills  
Conservation International**

# Table of Contents

<b>1 - INTRODUCTION</b>	<b>3</b>
1.1 - PURPOSE	3
1.2 - PROCESS	3
1.3 - STRUCTURE	3
<b>2 - LEGISLATIVE AND POLICY CONTEXT</b>	<b>4</b>
2.1 - CORE NATIONAL LEGISLATION AND POLICY	4
2.2 – THE RAMSAR CONVENTION	4
2.3 - OTHER RELEVANT LEGISLATION, POLICIES AND CONVENTIONS	5
2.3.1 - LEGISLATION:	5
2.3.2 - REGULATIONS:	5
2.3.3 - POLICY DOCUMENTS:	5
2.3.4 - MULTI-LATERAL ENVIRONMENT AGREEMENTS INTERNATIONAL CONVENTIONS	5
2.3.5 - REGIONAL CONVENTIONS	6
<b>3 – SITE DESCRIPTION</b>	<b>7</b>
3.1 - PHYSICAL PROFILE	7
3.1.1 – GENERAL DESCRIPTION	7
3.2.2 - TOPOGRAPHY	7
3.1.2 - GEOLOGY	7
3.1.3 - FOREST CLASSIFICATION, BIODIVERSITY AND INVASIVE SPECIES	8
3.2 – CLIMATE	8
3.2.1 - HISTORICAL CLIMATE	8
3.2.2 – CLIMATE PROJECTIONS	9
3.3 - SOCIOECONOMY	9
3.3.1 – CULTURAL SIGNIFICANCE	9
3.3.2 – POPULATION AND LIVELIHOODS	9
3.4 - SITE FACILITIES	9
3.4.1 - ACCESS ROAD	9
3.4.2 - CAR PARK	9
3.4.3 - TRAIL	10
<b>4 - MANAGEMENT CONTEXT AND KEY ISSUES</b>	<b>10</b>
4.1 - VISION STATEMENT	10
4.2 - SITE TARGETS:	10
4.3 – KEY THREATS:	11
4.4 - MANAGEMENT OBJECTIVES	11
<b>5 - MANAGEMENT STRATEGIES</b>	<b>12</b>
5.1 – CORE STRATEGIES FOR THREAT REDUCTION	12
5.2 - ONGOING GENERAL MAINTENANCE OF THE SITE	12
<b>6 - MONITORING AND EVALUATION PLAN</b>	<b>13</b>
<b>7 - WORKPLAN, TIMETABLE AND BUDGET:</b>	<b>13</b>

# 1 - Introduction

## 1.1 - PURPOSE

The management plan describes the priority strategies for the upland areas of the Lake Lanoto'o National Park that will best maintain and improve the key conservation values in these areas by reducing the impact of threats, including from climate change.

## 1.2 - PROCESS

The management planning process began in 20-24 August 2012 with the Site Management Planning Workshop for Climate Resilience of Samoa's forest. This workshop involved application of the Conservation Action Planning (CAP) Process of the Open Standards for the Practice of Conservation.

The UNDP/GEF Integration of Climate Change Risk and Resilience of Samoa's Forests (ICCRIFS) project afforded many opportunities to solicit feedback from various stakeholder groups, including the following:

**Table 1 – Consultations and Key Feedback**

STAKEHOLDERS	CONSULTATION DETAILS AND KEY FEEDBACK
Fusi, Lotofaga and Nu'usatia (villages adjacent to Lake Lanoto'o)	Part of early planning (2010) full support, suggestion of adaptation options and observed impacts of climate change. Feedback on perceptions and risks to natural assets as part of the vulnerability assessment (2012/13). Ongoing consultation framed through the participative three dimensional (P3D) modelling.
Samoaan Government	Other Divisions of MNRE for Technical guidance and mapping, Ministry of Women, Community and Social Development for village consultations, Ministry of Agriculture and Fisheries for advice on livestock and crop management.
National University of Samoa	Involvement in data collection and baseline surveys.
Non-government organisations	Involvement in data collection and baseline surveys.
Development agencies	Technical backstopping

The Participatory three dimensional (P3D) modelling was considered to be a central element of the community engagement for this site. The benefits of the P3D process included:

- Building of shared understanding of the biotic and abiotic components of the sites across the communities
- Building of a shared understanding of the ICCRIFS project and the opportunities that it created
- Representing a planning tool to facilitate community identification of areas requiring greater conservation protection and/or

Such preferences have been included within the management plan through the participation of relevant MNRE staff (i.e. that were involved in the P3D process) within the 2015 management planning workshop.

## 1.3 - STRUCTURE

The structure of the management plan reflects the outline discussed at the Site Management Planning Workshop of 20-24 August 2012, consistent with the application of the Open Standards for the Practice of Conservation. The structure was further refined based on suggestions received from participants at the workshop on integration of climate change impacts in the management plans for upland forest sites under the ICCRIFS project of 17-18 February 2015, and included consideration of the refinements to the CAP process since the initial workshop. In addition, the management plan structure reflects the legal obligations of the site under national law and international conventions.

## 2 - Legislative and Policy Context

### 2.1 - CORE NATIONAL LEGISLATION AND POLICY

The *Forest Management Act (2011)* consolidates the Law in Samoa for the effective and sustainable management of utilisation of forest resources. This Act is administered by the Ministry of Natural Resources and Environment (MNRE). The *Forest Management Act of 2011* makes provision for the establishment of management plans for national parks and reserves, and any licence/permit holder or forestry resource owner must always comply with all the provisions of said management plans.

The Lake Lanoto'o National Park is currently protected under the National Parks and Reserves Act 1974 which states under Section 5 that:

*“Every national park shall be preserved in perpetuity for the benefit and enjoyment of the people of Samoa and shall be administered so that:-*

- *It is preserved as far as practical in its natural state; and*
- *The flora and fauna in the national park are preserved as far as possible; and*
- *Its value as a soil, water, and forest conservation area is maintained ; and*
- *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 measures all the benefits including inspiration, aesthetic appreciation, enjoyment, and recreation, that may be derived from the natural features of the park”.*

The recent publication of the National Environment and Development Sector Plan (NESP) of 2013-2016 as also particularly relevant to the management plan, including through links with the following Key Environment Sector Objectives (KESO):

**KESO 1** - *To implement strategies for rehabilitating, protecting and conserving terrestrial (upland, lowland and coastal*

**KESO 3** - *To implement strategies for the restoration of critical habitats to species and recovery of species populations of conservation outcomes.*

**KESO 4** - *To implement strategies for protecting key environment resources such as forests and fisheries*

**KESO 11** - *To implement habitat/ecosystem-based strategies to support climate change adaptation and mitigation*

### 2.2 – THE RAMSAR CONVENTION

The Convention on Wetlands is an intergovernmental treaty adopted on 2th February 1971 in the Iranian city of Ramsar, on the southern shore of the Caspian Sea. Though the convention is commonly known as the Ramsar Convention, the official treaty is called *The Convention on Wetlands of International Importance especially as Waterfowl Habitat*. This reflects the original emphasis upon conservation and wise use of wetlands primarily for the habitat for water birds. However, over the years, the convention has broadened its scope to cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation and especially for the well-being of human communities.

Following Cabinet approval of the Ramsar Information Sheet (RIS), Samoa deposited its instrument of accession and associated documentation for the addition of Lake Lanoto'o to the Ramsar list during the Eighth Conference of the Parties to the Ramsar Convention (COP8) in Valencia, Spain in 2002. The Park was then declared as the first Ramsar Site in Samoa at Lake Lanoto'o during the commemoration of the World Biodiversity Day in 2003. However, Samoa officially became a party to the Ramsar Convention in November, 2004.

Article 2.1 of the Ramsar Convention requires Parties to designate at least one wetland at the time of accession for inclusion in the List of Wetlands of International Importance (the “Ramsar List”) and to promote its conservation.

Article 2.1 requires parties to continue to “designate suitable wetlands within its territory” for the List.

Article 3.1 is a general obligation under the Convention for Contracting Parties to include wetland conservation considerations in their national land-use planning. Under this Article, they have committed themselves to formulate and implement this planning so as to promote, as far as possible, **“the wise use of wetlands in their territory”**.

In Article 3.2, the Parties have committed themselves “to arrange to be informed at the earliest possible time if the ecological character of any wetland in its territory and included in the List has changed, is changing or is likely to change as the result of technological developments, pollution or other human interference. Information on such changes shall be passed without delay” to the Ramsar Secretariat.

Under Article 4, Contracting Parties undertake to establish nature reserves in wetlands, whether or not they are considered to be internationally important and included in the Ramsar List, and they also endeavor to promote training in the fields of wetland research, management and wardening.

Under Article 5, Contracting Parties agree to consult with other Contracting Parties about implementation of the Convention, especially in regard to transboundary wetlands, shared water systems, and shared species.

## **2.3 - OTHER RELEVANT LEGISLATION, POLICIES AND CONVENTIONS**

### **2.3.1 - Legislation:**

- Alienation of Customary Land Act 1965
- Water Resources Management Act 2008
- Forestry Management Act 2011
- Plants Act 1984

### **2.3.2 - Regulations:**

- Watershed Protection and Management Regulations 1992
- Wildlife Regulation 2004 (Amended superseded the "Protection and Conservation of Wildlife Animals Regulation 1993)

### **2.3.3 - Policy Documents:**

- National Forest Policy 1994 (Under Review)
- National Environment Management Strategies (NEMS) 1993 (Under Review- 2007)
- National Biodiversity Strategy & Action Plan 2001
- National Land use Policy 2001
- National Population and Sustainable Development Policy 2001
- National Bio-Safety Policy 2004
- National Heritage Policy 2004
- National Policy on the Conservation of Biological Diversity Policy 2005
- Strategies for the Development of Samoa (SDS) 2005 - 2007
- Codes of Environmental Practice 2006

### **2.3.4 - Multi-lateral Environment Agreements International Conventions**

- United Nations Convention on Biological Diversity (CBD) 1994
- World Forest Charter (WFC) 1994
- United Nations Framework Convention on Climate Change (UNFCCC) 2001
- United Nations Convention to Combat Desertification (UNCCD) 1998

- Kyoto Protocol (KP) 2000
- World Heritage Convention on Cultural and Natural Sites (World Heritage Convention) 2001
- Ramsar Convention on Wetlands 2004
- Convention for the International Trade of Endangered Species of Wild Fauna and Flora (CITES)

#### **2.3.5 - Regional Conventions**

- Convention on the Conservation of Nature in the South Pacific (Apia Convention) 1976
- Protocol Concerning Cooperation in Combating Pollution Emergencies in the South Pacific Region 1986
- Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (SPREP/Noumea Convention 1990)



# 3 – Site Description

## 3.1 - PHYSICAL PROFILE

### 3.1.1 – General Description

Lake Lanoto’o National Park is approximately 4,089 Ha and lies in central Upolu it is approximately 15.08km from Apia with the highest peak of 800m elevation. The site includes approximately 477 Ha of native upland forest area (i.e. above 600m in altitude, generally consistent with the 469.9Ha included under the RIS for Ramsar), which represents almost 12% of the site. Figure illustrates the broad features of the site.

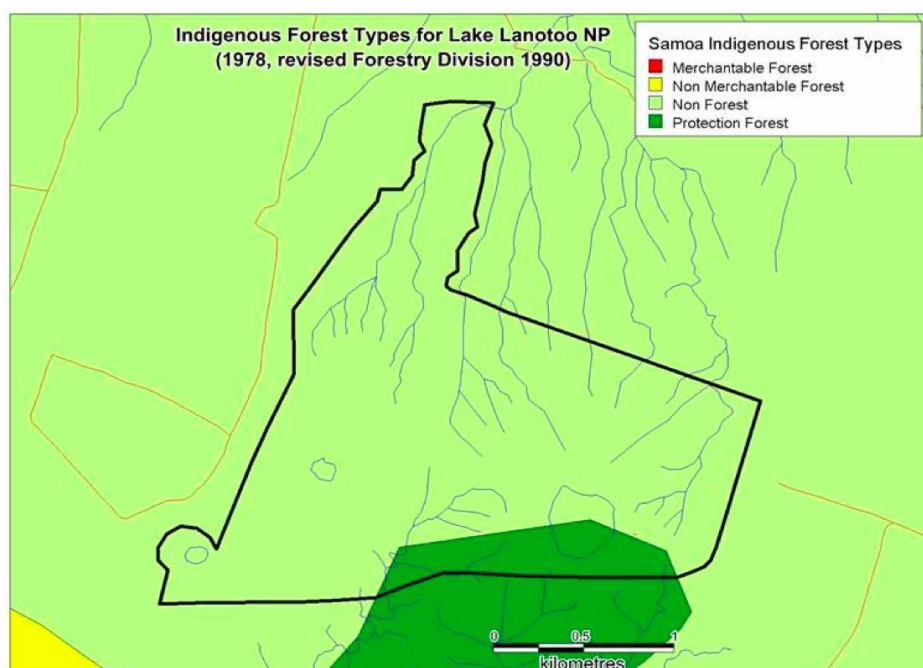


Figure 1 – Map of Lake Lanoto’o National Park (From Atherton, 2013)

The national Park is accessed by an access road from the main cross-island road in order to get to the hiking track that leads to the Park. A track to the lake is estimated 2.487km and it takes two ridges to get to the lake. Maintenance of this track is now with the Forestry Division. To the north west of the National Park is Mt Sigale and to the south east is Mt Fiamoe. The Southern side of the Park is Siumu and Safata Districts and to the north is Apia.

### 3.2.2 - Topography

The park boundary stretched out including 2 smaller lakes, Lake Lanoata’ata and Lano’anea, with the highest peak of 800m elevation. On the eastern side of the Park consist of plateau with the lake which is originally a volcanic crater. The plateau separates the lake and deep valley facing Apia. Streams do run from the lake going down to Se’ese’e or Northern side of the Park.

### 3.1.2 - Geology

The geology of the site suggests a relatively recent rock formation compared to the surrounding areas, with Salani volcanics dominating the area. A small area near the south of the Leafe river catchment is composed of older, Fagaloa volcanics.

### 3.1.3 - Forest Classification, Biodiversity and Invasive Species

In terms of proportions of site area, 73% of Lake Lanoto'o NP is considered to be montane rainforest, 21% is disturbed secondary forest, 4% is a non-native ecosystem and the remainder (3%) is covered by the 3 lakes. While significantly disturbed from the cyclones of the early 1990s and the subsequent problems with invasive species, the montane forest areas of the site were probably dominated by *maota mea* (*Dysoxylum huntii*).

The Rapid Biodiversity Assessment (BioRAP) of July 2014 that was conducted under ICCRIFS included a bird survey, invertebrate survey and a plant/flora list for Lake Lanoto'o. The conditions during the site survey excluded the possibility of a freshwater survey (no active streams) and poor weather conditions for the reptile survey.

The flora checklist for Lake Lanoto'o confirmed:

- 85% of native plant spp. Were recorded (i.e. compared to previous studies of 1992 and 1997)
- 17 species were not found in the survey
- 37 introduced plant species
- 7 of the 'worst' invasive species were found at the site, with suggestions that *vao fulufulu* (*Clidemia hirta* or Koster's Curse) to be the most damaging. Another comparably damaging species was identified as *teine ole po* (*Cestrum nocturnum*, night blooming cestrum). *Tamaligi pa'epa'e* (*Paraserianthis falcataria*, albizia) is located east of the study area where it was planted two decades ago.

In relation to bird species, Lake Lanoto'o was identified as an ideal site for recovery habitat for ma'oma'o (*Gymnomyza samoensis*), based on presence of Wattled honeyeater (*Foulehaio carunculata*).

Note that a 2009 freshwater survey of the Lake confirmed the presence of tilapia and two hawksbill turtles.

## 3.2 – CLIMATE

### 3.2.1 - Historical climate

Figure 2 illustrates the mean historical temperature for Apia, based on the work conducted under the Pacific Climate Change Science Program (2014).

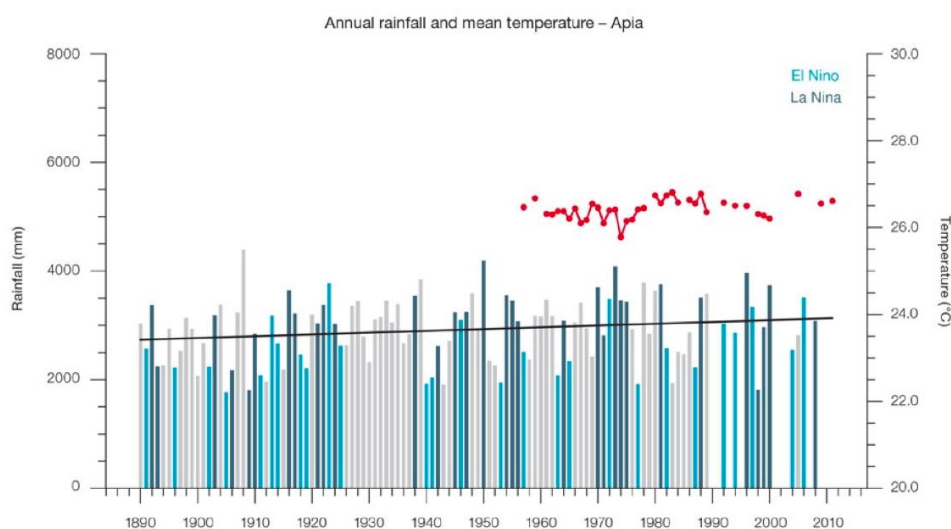


Figure 2 – Historical Climate in Apia (PCCSP, 2013)

While the coverage of weather stations in the upland areas of Samoa is limited, broad temperature estimates can be developed by applying the local lapse rate of 1°C per 100m. This means that for every 100m of altitude, the temperature is 1°C colder. This relationship has been one of the key assumptions for understanding the response of upland species to expected climate change.

### 3.2.2 – Climate Projections

The following represents the expected climate future for Samoa (PCCSP, 2013):

- El Niño and La Niña events will continue to occur in the future (*very high confidence*), but there is little consensus on whether these events will change in intensity or frequency;
- Annual mean temperatures and extremely high daily temperatures will continue to rise (*very high confidence*);
- Little change in mean annual rainfall (*low confidence*), with more extreme rain events (*high confidence*);
- Incidence of drought is projected to decline or stay approximately the same (*low confidence*);
- Reduction in the frequency of cyclones (*high confidence*), but a likely increase in windspeed and rainfall rates within 100km of the cyclone centre (*medium confidence*)

## 3.3 - SOCIOECONOMY

### 3.3.1 – Cultural Significance

Lake Lanoto’o derives from a legendary Samoan Story of descendants of the Tupa’isafe’e, who took the two wives of Si’utaulalovasa. The women gave birth to two boys; Ata and To’o, in which the title To’omata from Safata comes from. When Ata died in a battle, To’o was greatly saddened and he went to the inland of Upolu and dug a hole and filled it with his tears, thus the Crater Lake Lanoto’o is named after. The stories reflect the close interaction between our ancestors and nature. It shows our cultural/traditions and beliefs in our natural environment and all its existence are symbolic of historical events we now recalled as myths and legends. To date, there are no known archaeological values and assessments carried out at the site.

### 3.3.2 – Population and Livelihoods

The Lake Lanoto’o National Park site has 6 neighboring villages with a population of 2,280 people across 268 households – likely to be the main local beneficiaries of the management plan. Despite the national park status, there is evidence of human intrusion into the site with various livelihood activities. A new kava plantation was noted during the BioRAP study near the rim of Lano’anea crater. The presence of cattle at the central north area of the sites was also observed, not surprisingly given the unique situation of private land within the national park.

## 3.4 - SITE FACILITIES

### 3.4.1 - Access Road

The main access road to the National Park car park is about 3.4 kilometers from the Cross island road. The access road is not fully tar sealed and not in a good condition for safety of travellers and their vehicles. Maintenance would be required prior to any consideration of expansion of tourism associated with the site.

### 3.4.2 - Car park

The car park is located way outside of the Park boundary at a distance of approximately 500m. Parking is difficult as the area has become overgrown with weeds. A sign board about the park is located in the car park.

### 3.4.3 - Trail

The trail to the lake itself is approximately 2 kilometers. The track was extended as part of the BioRAP exercise in 2014 and which the maintenance of the track would be significant, it now offers a potentially superior experience by linking the east to the west borders of the site. The track itself can get particularly slippery, so consideration of associated risks would need to be part of any discussions on tourism expansion options.

## 4 – Site Management

### 4.1 - VISION STATEMENT

*Preserve the unique geophysical, biological and cultural values of Lake Lanoto’o National Park through sustainable management and development*

### 4.2 - SITE TARGETS:

These targets represent key species, species groups, ecosystems or ecosystem services that the management plan will focus on. Together, these targets represent the important biological characteristics of the site that are most worthy of conservation.

Table 2 – Site Targets

TARGET	DETAILS AND STATUS
Native species, with emphasis on threatened species	<b>Ma’o</b> (threatened species) recorded and good numbers of wattled honeyeaters, both species feed on nectar flowering plants. Potential as recovery habitat for Ma’o.
Native vegetation, including forest	Little intact vegetation to be found on the site, based on historical disturbance from cyclones and agriculture. Some evident threat from recent kava plantations and livestock. Most problematic invasive plants are <b>vao fulufulu</b> ( <i>Clidemia hirta</i> or Koster’s curse) and <b>teine ole po</b> ( <i>Cestrum nocturnum</i> , night cestrum).
Hydrological values	This includes consideration of the lake bodies, but also catchment management issues for the site. The Ramsar designation means that the water quality issues need to be carefully managed and ‘good forest’ is more likely to provide higher quality water regulating services than the dominant successional vegetation.

## 4.3 – KEY THREATS

This section summarises the threats to the site targets, categorised into threat ratings. Note that the prioritisation process reflected the impact of climate change on the threat – an examination of whether the expected climate change was likely to increase or decrease the magnitude of the threat.

Table 3 – Threats to Site Objectives

RATING	THREAT DETAILS, INCLUDING CLIMATE CHANGE (CC) IMPACT
HIGH	Invasive Plants: ↑impact under CC.
	Cyclones: ↑intensity, ↓frequency under CC.
	Pollution from agriculture and livestock: ↑impact under CC.
MEDIUM	Landclearing from agriculture, unchanged under CC
	Non-pollution impacts from livestock (e.g. vector for invasives)
	Range shift under CC
	Tourism, unchanged under CC.
LOW	Hunting, unchanged under CC
	Fishing, unchanged under CC.

Note that these ratings have been established based on the information at hand at the Management Planning Workshop and that there are a range of uncertainties that should be considered in terms of both gaps in biodiversity and climate information.

In comparing these threats against those perceived by the local communities in the vulnerability assessment consultations of 2012/13, invasive plants, pollution from agriculture were considered to be high risk by all respondents, but cyclones were only considered moderate.

## 4.4 - MANAGEMENT OBJECTIVES

Table 4 – Management Objectives

#	OBJECTIVE DETAILS
1	Reduce the impact of agriculture/livestock activities to protect hydrological values and soil quality
2	Reduce the population of invasive species for conservation of native species
3	Reduce forest recovery time after cyclones to maintain forest cover and native species.
4	Reduce the negative spillovers of potential income generation opportunities.

# 5 - Management Strategies

## 5.1 – CORE STRATEGIES FOR THREAT REDUCTION

The following set of strategies are proposed for the site to address what were judged to be the key threats to the site objectives.

Table 5 – Management Strategies

STRATEGY	Link to Objectives			
	1	2	3	4
<b>A - Enforce existing regulations:</b> The presence of kava plantations and livestock within the national park zone suggests that enforcement action may be warranted on site, subject to deliberations within MNRE.	✓	✓		✓
<b>B - Raising awareness of conservation, climate and ecosystem services:</b> Development of a community awareness program that discusses conservation, climate and ecosystem services in ways which are meaningful to local communities, including a focus on the links with upland management events.	✓	✓	✓	✓
<b>C - Monitoring program for soil/water quality:</b> More intense rainfall events coupled with an extended dry season may have a serious impact on soil and water quality, so a community-led ecological monitoring program will be established to determine whether any remedial activities are required.	✓			✓
<b>D - Rehabilitation of forest:</b> Appropriate application of ecological restoration techniques are a central element of this management plan. This will involve establishment of an appropriate guide, training on propagation and seedling development, restoration planning, maintenance and monitoring.		✓	✓	
<b>E - Invasive species control:</b> Knowledge of management techniques for invasive pests will greatly improve the capacity of both MNRE staff and landholders, with a particular focus on <i>vao fulufulu</i> ( <i>Clidemia hirta</i> or Koster's curse), <i>teine ole po</i> ( <i>Cestrum nocturnum</i> , night cestrum) and tilapia in the Lake.		✓		✓
<b>F - Promote utilisation of community development tools in the local area:</b> The use of the participatory 3D modelling approach to be expanded and augmented with a range of other participatory tools.	✓	✓	✓	✓
<b>G - Regulate tourism operations:</b> Tourism operators have the potential to damage the values of the site through activities such as the introduction of invasives and dropping of garbage. Regulation of tourism operators, including through the use of a simple certification and monitoring program will reduce the impact of tourists.		✓		✓
<b>H - Establishment of buffer zones around the boundaries:</b> The presence of a buffer around the site is to be explored, offering an opportunity to better protect the site from intrusion and invasion.	✓	✓	✓	

## 5.2 - ONGOING GENERAL MAINTENANCE OF THE SITE

The maintenance of site facilities described above is an important and ongoing responsibility for site managers. Specifically, such general maintenance will focus on trail maintenance, signage – including on biosecurity.

Such activities are reflected in the management plan budget.

## 6 - Monitoring and Evaluation

Tracking progress of strategies in reaching site objectives is an essential element of management planning, consistent with the Open Standards Project Cycle. Through gathering a targeted set of performance information, MNRE will be able to make key 'course corrections' in the implementation of the plan.

In this plan, monitoring refers to the ongoing collection of performance indicators against key site objectives, and evaluation refers to event-based activities that seek to answer broader questions of performance.

The following table describes the key indicators for the plan, and the methods for data collection.

**Table 6 – Monitoring Program**

<b>INDICATOR</b>	<b>FREQUENCY</b>	<b>METHOD</b>
Eradication of invasive species (Ha per species)	Annual	Through direct measurement of area covered.
Restoration of damaged areas according to ecological restoration techniques (Ha)	Annual	Through direct measurement of area covered. It is important to note that the location and composition of the restoration activities.
Participation in community awareness and capacity building programs	Quarterly	Use of attendance sheets in appropriate as an 'output' indicators.
Number of community members adopting sustainable techniques	Annual	This will require annual surveys of participating communities.
Number of community members participating in conservation activities	Annual	This will require annual surveys of participating communities.
Soil and water quality, growth of dominant tree species	Monthly	As per the ecological monitoring program

Note that tracking these indicators would also generate information consistent with MNREs reporting obligations under RAMSAR, as per Article 3.2 noted in section 2.2, above.

## 7 - Workplan, Timetable and Budget

This section describes the key 'building blocks' in the implementation of the strategies described above, and a preliminary budget. Note that this budget reflects the potential role of Lake Lanoto'o as a demonstration site for conservation management, and the expanded potential for ecotourism.

### Year 1

STRATEGY	KEY ACTIVITIES	BUDGET(WST)
A – Enforcement	MNRE to take internal decisions on the scale and scope of enforcement activities	N/A
C – Monitoring Program	<ul style="list-style-type: none"> <li>Design of ecological monitoring program for water, soil and dominant trees.</li> <li>Includes designation of sites for monitoring, including permanent tree plots.</li> </ul>	40,000
D & E (Invasives and Restoration)	<ul style="list-style-type: none"> <li>Preparation of an ecological restoration plan for the site covering:               <ul style="list-style-type: none"> <li>Selection of restoration method</li> <li>Identification of species</li> <li>Identification of priority sites</li> <li>Eradication of invasive species</li> </ul> </li> <li>Capacity building in MNRE (and core partners) on ecological restoration techniques</li> </ul>	70,000
G - Ecotourism	Feasibility study on eco-tourism in the site, including options for local regulation	30,000
H – Buffer Zones	Conduct initial consultation into the feasibility of establishing a buffer zone around the site	10,000
Ongoing Maintenance	<ul style="list-style-type: none"> <li>Preparation of a site maintenance plan</li> <li>Immediate focus on the track and car park, including existing signage.</li> <li>Initiate discussion with stakeholders on road maintenance</li> </ul>	20,000
<b>TOTAL BUDGET YEAR 1</b>		<b>170,000</b>

### Year 2

STRATEGY	KEY ACTIVITIES	BUDGET(WST)
A – Enforcement	As per MNRE recommendations from year 1.	5,000
B & F – Awareness and community tools program	<ul style="list-style-type: none"> <li>Confirmation of demand for specified topics with local communities.</li> <li>Preparation of a local language capacity building program that covers:               <ul style="list-style-type: none"> <li>Important biodiversity in the site</li> <li>Ecosystem services from uplands</li> <li>Likely climate change impacts</li> <li>Issues with infrastructure (downstream)</li> <li>Invasive eradication</li> <li>Ecological restoration</li> <li>Community decision-making tools, (inc P3D)</li> </ul> </li> </ul>	60,000
C – Monitoring program	Implementation as per monitoring program	10,000
D & E (Invasives and Restoration)	Implementation as per ecological restoration plan	30,000
G - Ecotourism	Establishment of regulation for eco-tourism operators in Lake Lanoto'o.	30,000
Ongoing Maintenance		10,000
<b>Total Budget</b>		<b>145,000</b>



### Year 3

<b>STRATEGY</b>	<b>KEY ACTIVITIES</b>	<b>BUDGET(WST)</b>
A – Enforcement	As per MNRE recommendations from year 1	5,000
B & F – Awareness program and community tools	Implement the community awareness program: <ul style="list-style-type: none"><li>○ Fusi</li><li>○ Lotofaga</li><li>○ Nu’usatia</li></ul>	20,000
C – Monitoring program	Implementation as per monitoring program	10,000
D & E (Invasives and Restoration)	Implementation as per ecological restoration plan	30,000
Independent mid-term evaluation	<ul style="list-style-type: none"><li>• Preparation of Terms of Reference(TOR) based on management objectives of site.</li><li>• Contracting of consultant (ideally local university)</li><li>• Delivery of report to Forest Board for consideration and decision</li></ul>	10,000
Ongoing Maintenance	Anticipate increased maintenance works	20,000
<b>TOTAL BUDGET YEAR 3</b>		<b>95,000</b>

### Year 4

<b>STRATEGY</b>	<b>KEY ACTIVITIES</b>	<b>BUDGET(WST)</b>
A – Enforcement	As per MNRE recommendations from year 1	5,000
B & F – Awareness program and community tools	Implement the community awareness program in downstream sites.	20,000
C – Monitoring program	Implementation as per monitoring program	10,000
D & E (Invasives and Restoration)	Implementation as per ecological restoration plan	30,000
Ongoing Maintenance		10,000
<b>TOTAL BUDGET YEAR 4</b>		<b>75,000</b>

### Year 5

<b>STRATEGY</b>	<b>KEY ACTIVITIES</b>	<b>BUDGET(WST)</b>
A – Enforcement	As per MNRE recommendations from year 1	5,000
C – Monitoring program	Implementation as per monitoring program	10,000
D & E (Invasives and Restoration)	Implementation as per ecological restoration plan	30,000
Final independent evaluation	<ul style="list-style-type: none"><li>• Preparation of Terms of Reference (TOR) based on management objectives of site.</li><li>• Contracting of consultant (ideally local university)</li><li>• Delivery of report to Forest Board for consideration and decision</li><li>• Determines level of implementation of mid-term recommendations</li></ul>	20,000
Ongoing Maintenance		10,000
<b>TOTAL BUDGET YEAR 5</b>		<b>75,000</b>

