Government of Samoa

MANAGEMENT PLAN

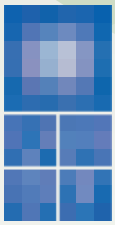
for the

VAIPU SWAMP FOREST

CONSERVATION AREA

2023-2032

Nagao Natural
Environment Foundation



Prepared for

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This Management Plan was launched on the 4th of April 2023, during commemoration of World Wetlands Day, International Day of Forests, World Water Day and National Sanitation Day, as a joint event by the Ministry of Natural Resources and Environment.

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Vaipu Swamp Forest © Elizabeth Kerstin-Yoshida

Executive Summary

This document is a Management Plan for the conservation of the natural resources and biodiversity of the Vaipu Swamp Forest Conservation Area (CA) for the period 2023-32 (10 years). The Vaipu Swamp CA is located in the east of Upolu and covers an area of approximately 280 hectares (690 acres) and ranges in elevation from 260m to 280m asl. The CA is protects one of the rarest ecosystems in Samoa- namely mixed swamp forest containing rare species including the Manumea (*Didunculus strigirostris*), rare plants and land snails.

This management plan describes the vision, targets, threats, objectives and proposed strategies and rules for the conservation and maintenance of the forests and biodiversity of the Vaipu Swamp CA. Conservation involves the maintenance of the ecological components of soil, water and fauna and flora, the ecological processes including water flow, carbon cycles, connectivity between land and sea, including species movements as well as the ecosystem services including all the human benefits provided by the CA. Detailed workplans and costed implementation plans will need to be prepared at a later date for implementation of project strategies.
The Vaipu swamp area is currently under the customary ownership of Va'a o Fonoti district to the north, but has strong historical links to Lotofaga district to the south. No people live within the CA, although a few live nearby along the Richardson Track. Adjacent villages include Lotofaga to the South, Tiavea Uta to the East and Fagaloa Bay to the North. The CA is within the Eastern Upolu Catchments Key Biodiversity Area or KBA. Although around 90% of the project area is forested, parts of the buffer area around the CA are invaded with invasive plants and in need of restoration.

A 2017 baseline survey of the swamp confirmed the conservation values of the swamp and its priority for conservation. Biodiversity recorded in the 278.318 hectare swamp includes the following:

- **30 tree species, including the endangered bush palm, *Clinostigma warburgii***
- **25 bird species plus an uncorroborated observation of the Tooth-billed Pigeon (*Didunculus strigirostris*)**
- **10 land snail species, including three endemic snails *Eua expansa, Samoana canalis* and *Succinea putamen***
- **7 skinks, half of Samoa's skink fauna**
- **4 fish, including the endemic *Kuhlia rupestris***
- **4 ant species, mostly introduced**
- **3 butterflies**
- **2 flying fox species**

The management planning process was conducted over 2 months starting with a review of the existing biological data. Stakeholders were consulted on the draft plan in early 2023 and the draft management plan was approved at a community landowner meeting held on January 20, 2023.

1. INTRODUCTION

This document is a Management Plan for the conservation of the natural resources and biodiversity of the Vaipu Swamp Forest Conservation Area (CA) for the period 2023-32 (10 years). The Vaipu Swamp CA is located in the east of Upolu and covers an area of approximately 280 hectares (690 acres- see Figure 1). The CA is protecting one of the rarest ecosystems in Samoa- namely mixed swamp forest containing rare species including the Manumea (*Didunculus strigirostris*), rare plants and land snails.

The Vaipu Swamp CA Management Plan was developed following biodiversity surveys conducted in 2017 (MNRE 2023) and as well as consultations with landowners in 2022 and early 2023. The purpose of this management plan is to identify the strategies for the conservation and sustainable management of the natural, economic and cultural values of the Vaipu Swamp CA.

The plan recognizes three broad stakeholders and interest groups whose collective goal is to sustainably manage the natural resources of the CA: the interests of the Government of Samoa as stated in its laws and policies; the individual interests of landowners and finally broader national interests and collective concerns and responsibilities. The plan mediates between the three stakeholder groups by developing mutually agreed rules that promote sustainability.

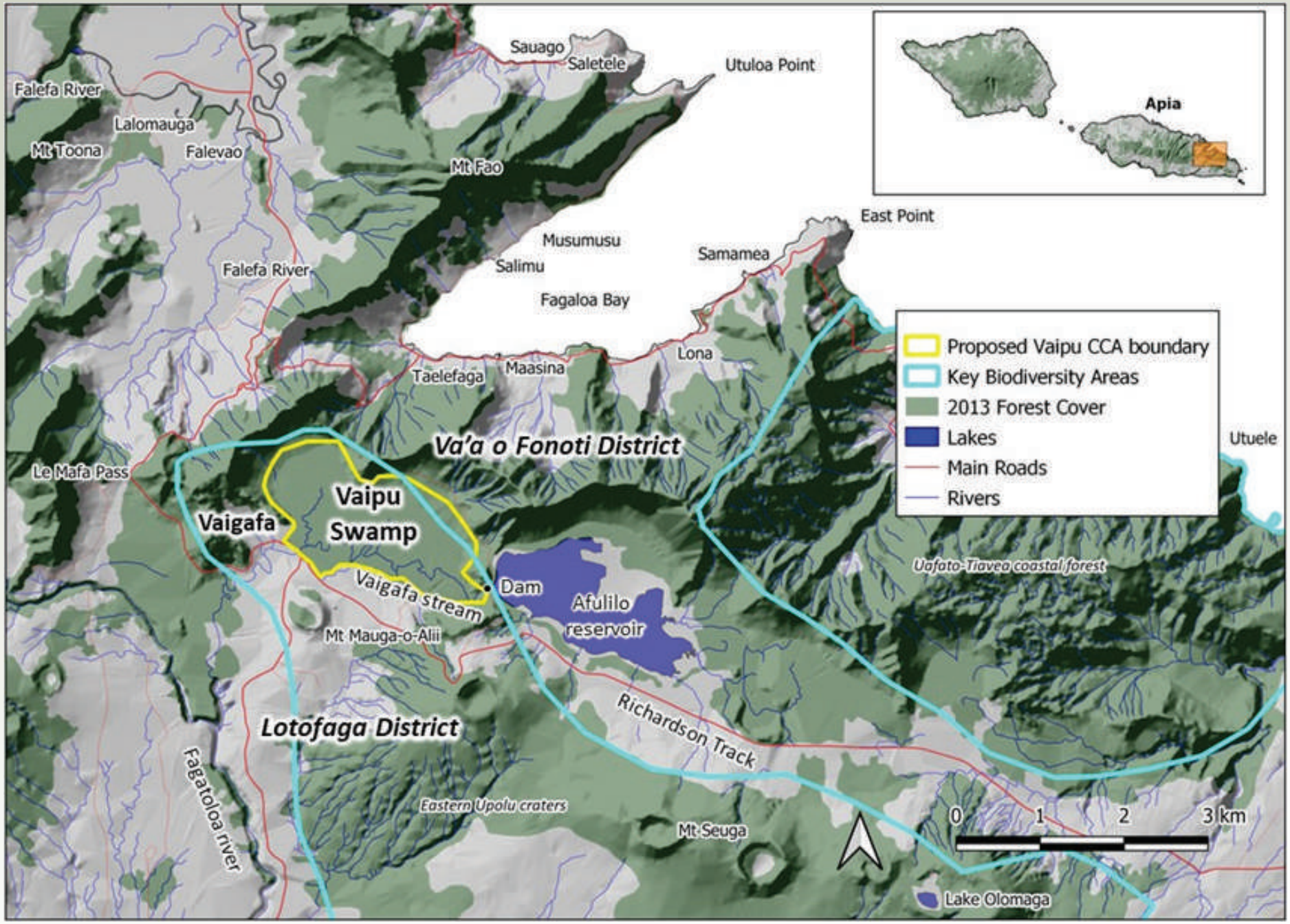
1.1. PURPOSE

This management plan describes the vision, targets, threats, objectives and proposed strategies and rules for the conservation and maintenance of the forests and biodiversity of the Vaipu Swamp CA. Conservation involves the maintenance of the ecological components of soil, water and fauna and flora, the ecological processes including water flow, carbon cycles, connectivity between land and sea, including species movements as well as the ecosystem services including all the human benefits provided by the CA. Detailed workplans and costed implementation plans will need to be prepared at a later date for implementation of project strategies.

1.2. PROCESS

The management planning process was conducted over 2 months starting with a review of existing biological data (MNRE 2023). Stakeholders were consulted on the draft plan in early 2023 and the draft management plan was approved at a community landowner meeting held on January 20, 2023.

Figure 1. **Location and features of the Vaipu Swamp CA**



2. LEGISLATIVE *and* POLICY CONTEXT

2.1. CORE LEGISLATION

There are a number of laws that relate to the establishment of conservation areas in Samoa or for the preparation of management plans for the conservation of such areas.

The *Village Fono Act 1990* gives villages the right to make land management decisions and pass village bylaws, including for the establishment of conservation areas, on village land.

The *Forest Management Act 2011* consolidates the law for the sustainable management of forests and makes provisions for the establishment of management plans for National Parks and Reserves.

The draft *Environmental Management and Conservation Bill 2014* specifically covers the establishment of conservation areas as well as the development of community conservation area management plans.

3. SITE DESCRIPTION

3.1. GENERAL DESCRIPTION

The Vaipu Swamp CA is located in a natural basin at around 260m elevation along the upper reaches of the Vaigafa river at the eastern end of Upolu 2km south east of Le Mafa Pass and 100m west of the Afulilo hydroelectric dam run by the Electric Power Corporation (EPC) (see Figure 1). The Vaigafa river itself flows into the Fagatoloa river (also called the Salani river) which flows southwards to Salani village.

The swamp area is currently under the customary ownership of Va'a o Fonoti district to the north, but has strong historical links to Lotofaga district to the south. No people live within the CA, although a few live nearby along the Richardson Track. Adjacent villages include Lotofaga to the South, Tiavea Uta to the East and Fagaloa Bay to the North (see Figure 1). The CA includes the swamp and adjacent forested land and covers approximately 280 hectares. It ranges in elevation from 260m to 280m asl. The CA is within the Eastern Upolu Catchments Key Biodiversity Area or KBA (CI, MNRE and SPREP 2010). Although around 90% of the project area is forested parts of the buffer area around the CA are invaded with invasive plants and in need of restoration.

3.2. LANDOWNER GROUPS AND COMMUNITIES

As noted, the conservation area includes land under the customary ownership of the Va'a o Fonoti political district. Historically however, the site had strong historical links to Lotofaga district. The demographics of these two districts are shown in table 1 below.

Table 1. Demography of landowning groups (SBS 2022)

Political District	Names of villages in district	2021 Population	2021 Males	2021 Females
Va'a o Fonoti	Uafato, Samamea, Lona, Maasina, Taelefaga, Salimu, Musumusu, Saletele, Sauano	1295	687	608
Lotofaga	Matatufu, Lotofaga, Vavau	1882	928	954

3.3. GEOGRAPHICAL FEATURES

The key geographic or topographic feature of the CA is that it lies at 260m in a poorly drained natural basin fed by the Vaigafa stream as it flows out of the Afulilo dam (see Figure 2). Water quality results for the Vaipu swamp for each of the components tested in 2017 were all within the World Health Organization standards. The water flow for the Vaipu swamp is perennial and according to the MNRE's Water Resource Division database, the river flowing through the swamp has maintained an average flow height of between 0.6m and 0.9m since 2009.

The geology of the swamp is the Salani volcanics, which is relatively old (for Samoa), heavily weathered and deeply incised lava flows around 750,000 years old (Jopling 2019). Immediately to the north of the swamp is the much older and deeply weathered Fagaloa volcanics at around 3 million years old.

The swamp has two kinds of soil- "Vaigafa silty lay and loam- a gley soil covering most of the central portion, and "Vaiola sandy clay loam" - a recent soil derived from alluvium found around the edges.
The area is very wet with standing or flowing water covering much of the surface. Areas at slightly higher elevation such as along stream banks provide a habitat for high plant species diversity (Park *et al* 1991).

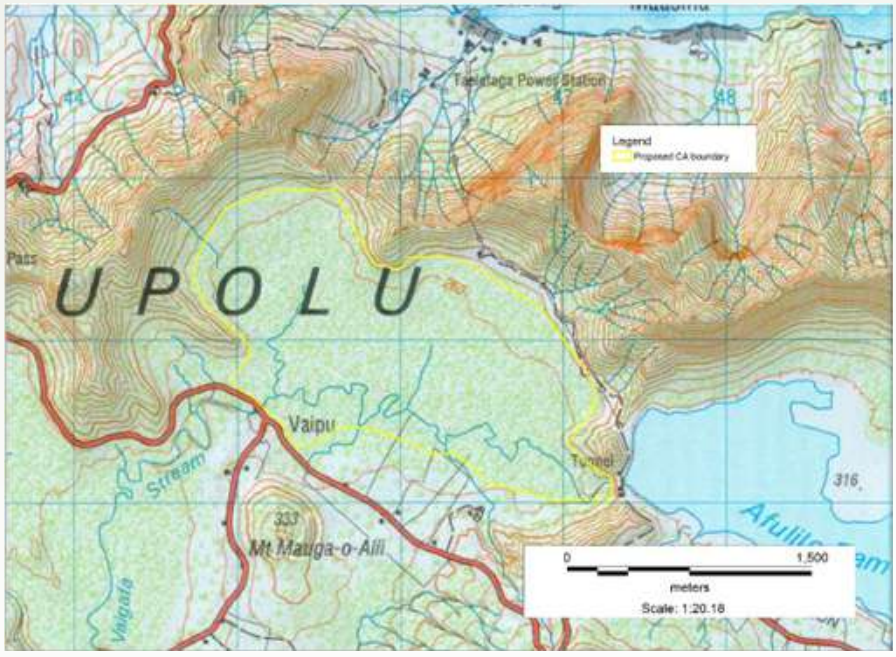
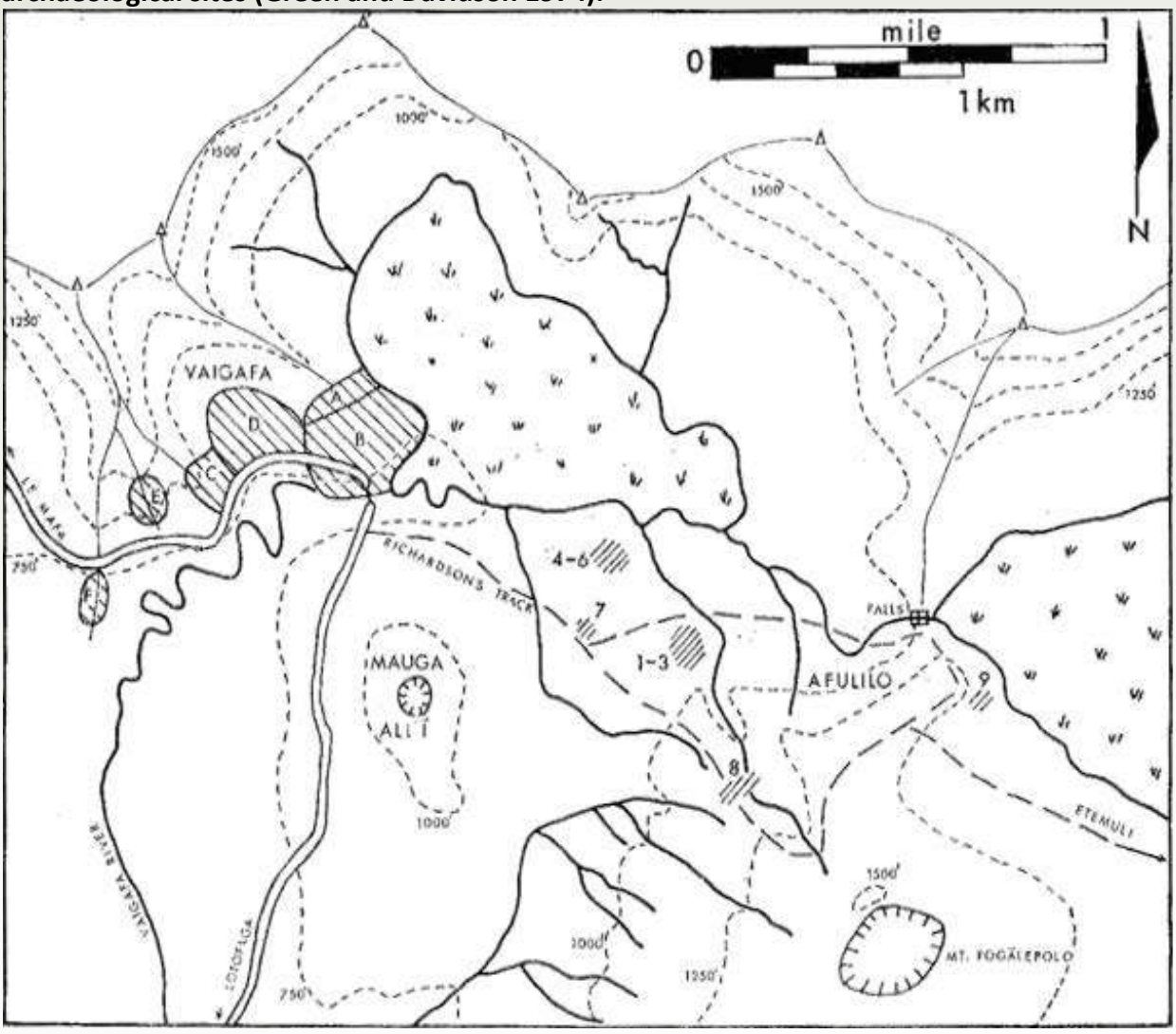


Figure 2. Topography of the Vaipu Swamp CA

3.4. HISTORICAL FEATURES

According to archaeological surveys of Samoa (eg Green and Davidson 1974), an area immediately to the west of the Vaipu swamp called Vaigafa was inhabited for around 500 years from around 1380 AD to the early nineteenth century (Figure 3). Vaigafa features in many traditions, both as an important settlement and as place for catching pigeons. The site includes walls, ditches, house foundations and ovens. There is evidence of cultivation areas, burial places and fortifications and it was clearly a planned settlement. Nearby on the crater rim of Mauga Alii around 1km to the south, are further platforms, ovens and terraces and ovens as well as a ten sided star mound and possible graves of the Tui Atua (see Figure 3). All of these sites are little known and worthy of further surveys as well as potential future restoration (Fonoti pers. comm 2022).

Figure 3. Historical sites adjacent to the Vaipu swamp. Letters and numbers represent archaeological sites (Green and Davidson 1974).



3.5. BIODIVERSITY

The most recent biodiversity survey of the swamp was conducted in 2017 including birds, plants, butterflies, land snails, reptiles and freshwater fauna, (MNRE 2023), while surveys of birds and plants were conducted in 1991 (Park *et al*) and in 1996 (Schuster *et al*).

The 2017 baseline survey confirmed the conservation values of the swamp and its priority for conservation as part of the Eastern Upolu Craters Key Biodiversity Area (CI, MNRE and SPREP 2010). Biodiversity recorded in the 278.318 hectare swamp includes the following:

- 30 tree species, including the endangered bush palm, *Clinostigma warburgii*
- 25 bird species plus an uncorroborated observation of the Tooth-billed Pigeon (*Didunculus strigirostris*)
- 10 land snail species, including three endemic snails *Eua expansa, Samoana canalis* and *Succinea putamen*
- 7 skinks, half of Samoa's skink fauna
- 4 fish, including the endemic *Kuhlia rupestris*
- 4 ant species, mostly introduced
- 3 butterflies
- 2 flying fox species

Birds and trees recorded in the swamp in the 2017 survey are shown in Table 2 (Birds) and Table 3 (Trees) below.

Table 2. Birds recorded in the Vaipu Swamp forest in descending order of dominance (MNRE 2023)

No	Common Name	Scientific Name	Samoan Name	Status
1	Samoan whistler	*Pachycephala flavifrons*	Vasavasa	Endemic
2	Samoan triller	*Lalage sharpei*	Miti	Endemic
3	Crimson crowned fruit dove	*Ptilinopus porphyraceus*	Manutagi	Endemic
4	Samoan starling	*Aplonis atrifusca*	Fuia	Endemic
5	Samoan fantail	*Rhipidura nebulosa*	Se'u	Endemic
6	Flat billed kingfisher	*Todirhamphus recurvirostris*	Ti'otala	Native
7	Pacific scarlet robin	*Petroica multicolor*	Tolai'ula	Native
8	Cardinal honeyeater	*Myzomela cardinalis*	Segasegamau'u	Native
9	White rumped swiftlet	*Aerodramus spodiopygius*	Pe'ape'a	Native
10	Polynesian triller	*Lalage maculosa*	Miti tai	Native
11	Wattled honeyeater	*Foulehaio carunculata*	Iao	Native
12	Polynesian starling	*Aplonis tabuensis*	Fuia vao	Native
13	Blue crowned lory	*Vini australis*	Segavao	Native
14	Many-coloured fruit dove	*Ptilinopus perousii*	Manuma	Native
15	Pacific Imperial pigeon	*Ducula pacifica*	Lupe	Native
16	White throated pigeon	*Columba vitiensis*	Fiaui	Native
17	Banded rail	*Gallirallus philippensis*	Ve'a	Native
18	Purple swamphen	*Porphyrio*	Manuali'i	Native
19	Jungle myna	*Acridotheres fuscus*	Maina fanua	Introduced/Invasive
20	Red-vented bulbul	*Pycnonotus cafer*	Manupalagi	Introduced/Invasive

No	Common Name	Scientific Name	Samoan Name	Status
21	Barn owl	*Tyto alba*	Lulu	Native
22	Pacific black duck	*Anas superciliosa*	Toloa	Native
23	Brown noddy	*Anous stolidus*	Gogo	Native
24	White tern	*Gygis alba*	Manusina	Native
25	White-tailed tropicbird	*Phaethon lepturus*	Tava'e	Native

Table 3. Trees recorded in the Vaipu Swamp forest in descending order of dominance (MNRE 2023)

No	Scientific name	Samoan name	Frequency	Endemic
1	*Alphitonia zizyphoides*	Toi	Occasional	No
2	*Barringtonia samoensis*	Falaga	Very common	No
3	*Calophyllum neo-ebudicum*	Tamanu	Common	No
4	*Cananga odorata*	Mosooi	Common	No
5	*Clinostigma warburgii*	Niu vao	Occasional	No
6	*Cyathea lunulata*	Olioli	Very common	No
7	*Elaeocarpus floridanus*	Aamatie	Occasional	No
8	*Endiandra elaeocarpa*	Endiandra	Occasional	No
9	*Fagraea berreroana*	Pualulu	Common	No
10	*Flacourtia rukam*	Filimoto	Occasional	No
11	*Glochidion ramiflorum*	Masame	Occasional	No
12	*Hernadia moerenhoutiana*	Pipi	Occasional	No
13	*Hibiscus tiliaceus*	Fau	Abundant	No
14	*Inocarpus fagifer*	Ifi	Abundant	No
15	*Macaranga stipulosa*	Lau fatu	Occasional	No
16	*Manilkara dissecta*	Pani	Occasional	Yes
17	*Myristica hypargyraea*	Atone ulu	Occasional	No
18	*Myristica inutilis*	Atone	Occasional	No
19	*Neonauclea forsteri*	Afa	Common	No
20	*Palaquium stehlinii*	Gasu	Occasional	No
21	*Pandanus turritus*	Fasa	Common	No
22	*Planchonella garberi*	Alaa	Occasional	No
23	*Planchonella samoensis*	Mamalava	Occasional	No
24	*Pometia pinnata*	Tava	Occasional	No
25	*Psydrax merrillii*	Olasina	Occasional	No
26	*Rhus taitensis*	Tavai	Occasional	No
27	*Sarcopygme pacifica*	Uunu	Occasional	Yes
28	*Sterculia fanaiho*	Fagaio	Occasional	No
29	*Syzygium inophylloides*	Asi toa	Occasional	No
30	*Syzygium samarangense*	Nonu vao	Occasional	No

3.5.1. SIGNIFICANT SPECIES

Significant species found in the CA, including those classified as threatened on the IUCN Red List 2022, as well as those considered locally significant are shown in table 4.

Table 4. Significant species found in the Vaipu Swamp CA

Scientific name	Samoan Name (English Name)	Taxonomic Group	Reason for inclusion
Clinostigma warburgii	Niu vao (Samoan bush palm)	Plants (Palms)	Locally threatened
Columba vitiensis	Fiaui (White throated pigeon)	Birds	Locally threatened
Didunculus strigirostris	Manumea	Birds	IUCN Critically Endangered
Ducula pacifica	Lupe (Pacific pigeon)	Birds	Locally threatened
Pteropus samoensis	Pea vao (Samoan flying fox)	Flying Foxes (Mammals)	IUCN Near Threatened (Endangered in Samoa)
Eua expansa, Samoana canalis, Succinea putamen and other native snails	Sisi (Snail)	Land snails	Locally threatened

3.6. KEY THREATS

A number of threats to the natural heritage of the Vaipu Swamp forests have been identified and can be divided into two main types: “direct” and “indirect”. Direct threats are those that act directly on the natural resources, while indirect threats are the forces or root causes driving the threats.
There are five major direct threat groups: clearance of the swamp for farming, forest clearance for a potential hydro power augmentation project, overharvest of native fauna and flora, the spread of invasive species and natural disasters such as from cyclones. The indirect threats or driving forces for these threats include population growth, demand for money or for increased consumption, development pressures and natural disasters exacerbated by climate change. It should be noted that one community respondent noted that there had been an oil spill from the Afulilo dam that flowed down the Vaigafa stream through the swamp, however no evidence for this could be found and the managers of the dam were adamant that no oil was stored at the dam.

FOREST CLEARANCE FOR FARMING AND AQUACULTURE

There are a few plantations and cattle farms to the south of the swamp area adjacent to the Richardson’s track. There is also a former aquaculture operation. There is potential for expansion of these into the swamp area.

FOREST CLEARANCE FOR HYDRO POWER

The Electric Power Corporation has indicated in the past their interest to flood part of the Vaipu forests to augment the hydropower facility at Afulilo. Although currently there are no such plans to further develop the hydropower scheme, this must remain a potential future threat as long as the CA is not protected.

INVASIVE SPECIES

As elsewhere in Samoa, invasive species are a major threat to the native biodiversity in the Vaipu Swamp CA. Of particular concern are the following plant species: fue lautetele (*Merremia peltata*), la’au laumamoe (*Clidemia hirta*) and vao mini (*Hyptis rhomboidea*).

In addition to invasive plants are rats (Polynesian rat and Ship rat), cats, myna birds (Jungle and Common mynas) and wild pigs and introduced Tilapia fish (*Oreochromis niloticus*). There are also cattle ranches around the swamp and cattle occasionally enter the swamp area when fences break.

OVERHARVEST OF NATIVE FAUNA AND FLORA

Despite bans on hunting native birds and flying foxes, many animal species are harvested from the Vaipu Swamp forests including pigeons as well as freshwater prawns, eels, and wild pigs. The hunted bird and flying fox species include the pigeon species of Lupe (Pacific Pigeon, *Ducula pacifica*), Fiaui (White-throated Pigeon, *Columba vitiensis*) and Samoan flying fox (*Pteropus samoensis*)- all protected under national law (Protection of Wildlife Regulations 2004).

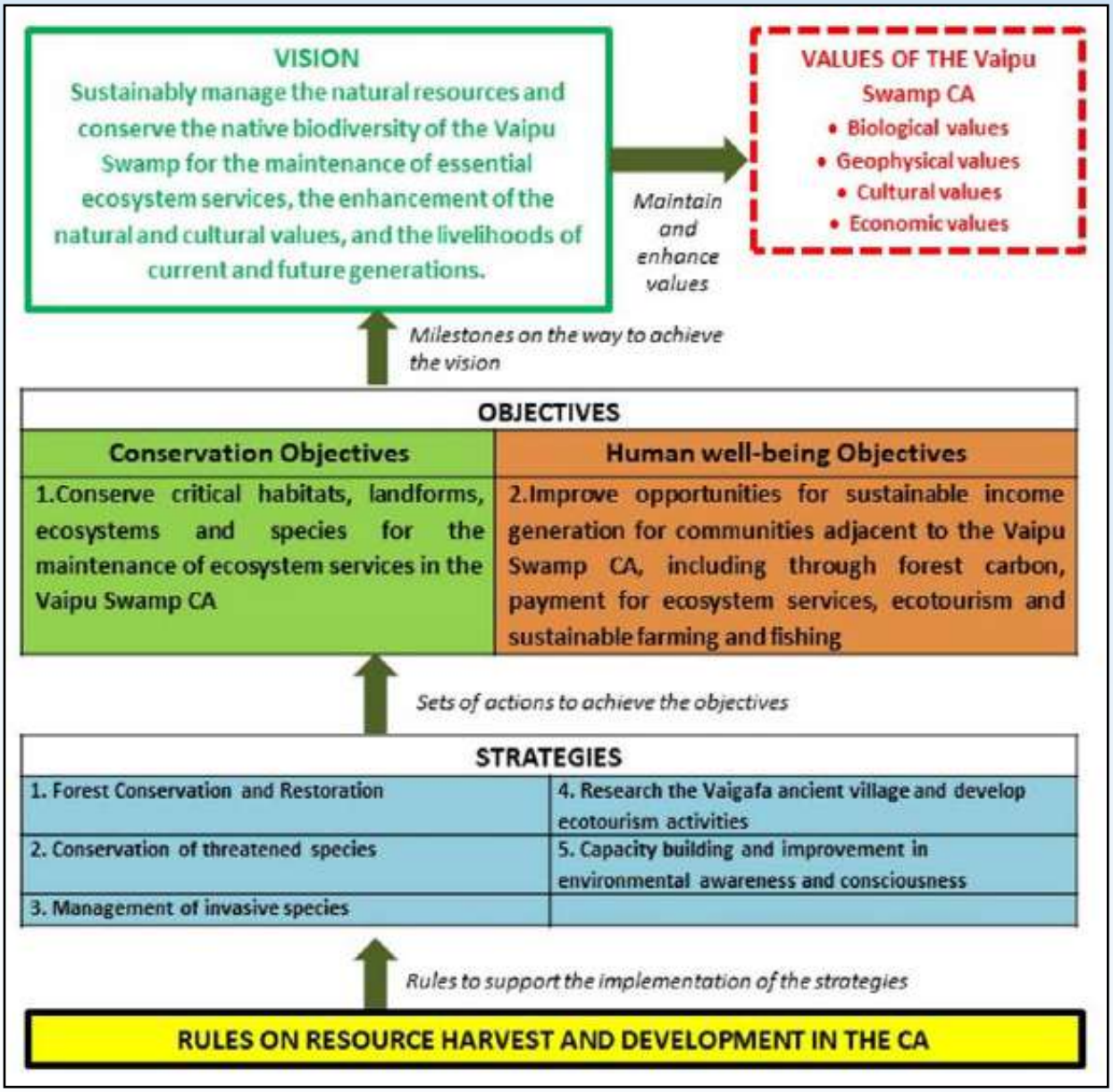
NATURAL DISASTERS

Natural disasters such as cyclones, floods, fire, earthquakes and related phenomena such as tsunami are well recognised as major drivers of ecosystem change in the Pacific. Samoa is no exception and is particularly prone to cyclones with Apia experiencing approximately 10 tropical cyclones per decade. The Vaipu Swamp forests, like all areas in Samoa, have been impacted by many cyclones over the years including Cyclone Val in 1991, Evan in 2012 and Gita in 2018. The best strategy to increase resilience against these natural disasters is to restore degraded areas with native plants, to minimise further forest loss and to manage the spread of invasive species, especially invasive plants, all strategies that are included in this management plan.

4. MANAGEMENT CONTEXT

The management plan follows a logical process and hierarchy down from a clear identification of the important **values** of the CA, a long-term **vision** to maintain and enhance those values, a set of intermediate **objectives** that are milestones on the way to achieving the vision as well as the **strategy** that outlines the actions and steps to be taken along the way. Finally, a set of CA **rules** established and enforced by the CA Management Committee for the use of the natural resources in the CA supports the strategies. The relationship and flow between all these elements can be illustrated diagrammatically as in figure 4 below. Each element is explained in more detail in the following sections.

Figure 4. Relationship between main management plan elements



4.1. CA VALUES

The following are considered the values, or important features of the Vaipu Swamp CA, as identified by community groups and advisers. It is these values that the CA must try and maintain and ideally enhance.

Biological values- the unique flora and fauna and ecosystems of the CA. In this case the key values here are the unique mixed swamp ecosystem with is component species including a number of rare and threatened species such as Manumea (tooth-billed pigeon), Niu Vao (bush palm), Pe'a Vao (Samoan flying fox) and various species of land sail or Sisi.

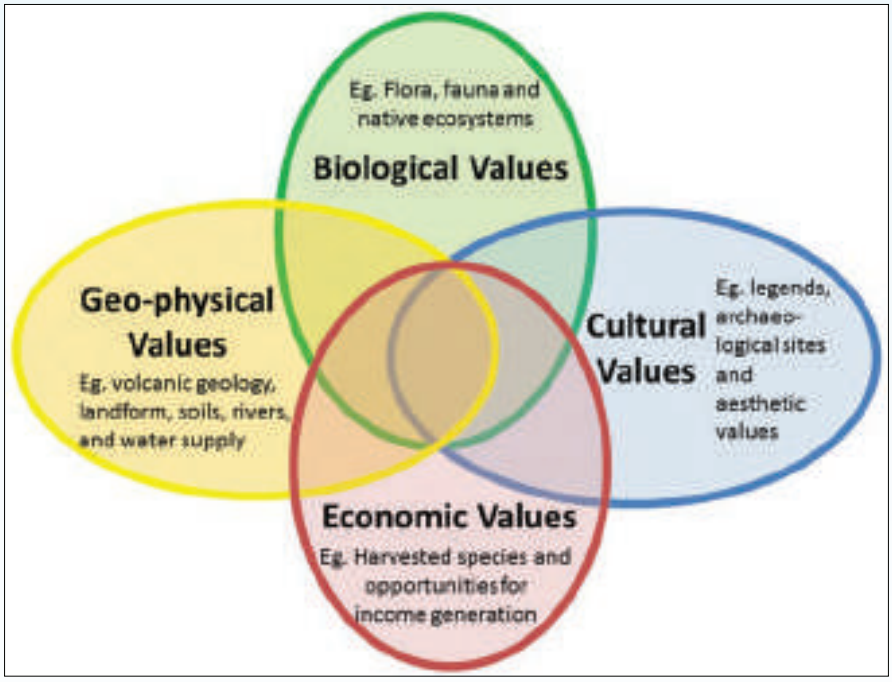
Geophysical values- the unique geology, the land form and soils, and the streams and water supply. The Vaigafa and Fagatoloa rivers are the water supply for Lotofaga district, hence the need to keep the catchment in a healthy condition.

Cultural values- the unique cultural practices, legends, archaeological sites and aesthetic values. The ancient Vaigafa village is adjacent to the swamp and there are numerous other archaeological sites including star mounds and tombs in the vicinity that are worthy of further study and conservation

Economic values- the value of the CA as a site supporting the livelihoods of local people – from harvesting the natural resources including fish and pigeons as well as potentially from ecotourism and other forms of livelihood generated from the CA.

Site values are all related, overlapping and influence each other as can be illustrated in Figure 5.

Figure 5. Values of the Vaipu Swamp CA



4.2. VISION STATEMENT

English: Sustainably manage the natural resources and conserve the native biodiversity of the Vaipu Swamp CA for the maintenance of essential ecosystem services, the enhancement of the natural and cultural values, and the livelihoods of current and future generations.

Samoan: Ia faaauuuina le puleaina tatau o alaga-oa faalenatura atoa ai ma le faasaoina ma le puipuia o le ola faalenatura o meaola I laufanua ma vaomatua o Vaipu ma le toe totoina o vaomatua ma le faaleleia o nofoaga taua faale aganuu aemaise o le tulaga I le soifua manuia o auga tupulaga mo nei ma a taeao

4.3. GUIDING PRINCIPLES

A number of guiding principles have been identified that guide the implementation of the management plan.

- All landowners of Vaipu Swamp are stakeholders in the management of the CA.
- All inhabitants of Vaipu Swamp and visitors to the CA have responsibilities for the management of the CA.
- All actions and developments in the Vaipu Swamp CA should adhere to the management plan.
- The Government of Samoa and its NGO and other partners will help build the capacity of Vaipu Swamp CA Management Committee to implement the management plan.
- Management of the Vaipu Swamp CA shall be supervised by the Vaipu Swamp CA Management Committee which will have the legal authority to conduct its role.
- The CA management committee will have the power to set all rules and fines in the CA.
- The CA management committee shall have transparent and accountable processes as well as established mechanisms for grievances and dealing with disputes.
- The Vaipu Swamp CA will be managed in an adaptive management approach, whereby management strategies, actions, rules and fines will be revised as required based on changing circumstances or new information.

4.4. MANAGEMENT OBJECTIVES

Management objectives are the milestones, intermediate results or **desired changes** that are necessary to achieve the vision. The objectives specify the desired changes in the factors (direct and indirect threats and opportunities) that need to be achieved in the short and medium-term. A good objective meets the criteria of being results oriented, measurable, time limited, specific, and practical.

Two main types of objectives have been identified for Vaipu Swamp: a conservation objective and a human well-being (or socio-economic) objective, reflecting the close inter-relationships between environmental conservation, improving livelihoods and maintaining culture and traditions. Table 5 identifies the 2 main objectives for the Vaipu Swamp CA.

Table 5. Management Objectives for the Vaipu Swamp CA

Conservation Objective	Human well-being Objective
1. Conserve critical habitats, landforms, ecosystems and species for the maintenance of ecosystem services in the Vaipu Swamp CA	2. Improve opportunities for sustainable income generation for communities adjacent to the Vaipu Swamp CA, including through forest carbon, payment for ecosystem services, ecotourism and sustainable farming and fishing

5. MANAGEMENT STRATEGIES

A strategy is a **set of actions** with a common focus that work together to achieve project objectives and to deal with threats. Implementation of many of the strategies can commence immediately. Five strategies have been identified for the achievement of CA objectives and to manage current and anticipated future threats, including climate change. A major assumption in these strategies is that by dealing with current threats to the Vaipu Swamp forests such as from hunting or invasive species, that the resilience of the CAs to future threats such as climate change will be increased. Many strategies can influence multiple objectives and strategies - for example, increasing environmental awareness helps achieve all objectives and contributes to all strategies while dealing with invasive species promotes site and species conservation.

5.1. FOREST CONSERVATION AND RESTORATION

The proposed rules related to forest conservation are shown in section 6. A full list of recommended actions to conserve the Vaipu swamp are as follows:

- Ban any logging in the CA;
- No new gardens allowed in the CA;
- No aquaculture allowed in the CA, but permissible in a buffer zone around it;
- Plant harvesting to only be allowed for subsistence purposes in the CA and to comply with the Forestry Management Act 2011;
- Encourage improved agroforestry techniques in the areas surrounding the CA;
- Raise awareness and educate villagers on the benefits of intact native forest (water catchment protection, wildlife, eco-cultural tourism, and other values);
- Establish alternative income (e.g. forest carbon payment for ecosystem services and eco-tourism) and traditional gardening opportunities to offset any potential impact of bans on resource harvest or forest clearance;
- Prepare a plan for restoring degraded areas of the Vaipu Swamp forest to include areas to be restored, species to be used and planting plan;
- Install signs that explain the boundaries and management rules of the CA.

5.2. CONSERVATION OF THREATENED SPECIES

The project aims to conserve all native species in the CA. However, some species have been identified as specific targets because of their rarity or threat including the native bush palm (Niu Vao), native pigeons (Manumea, Lupe, Fiaui), fruit doves (Manutagi, Manuma), flying foxes (Pe'a) as well as native snails (Sisi).

Samoa has laws banning the hunting of native birds (pigeons in particular) and flying foxes but there is little effort to enforce these laws. Much greater effort needs to be placed on raising awareness of these laws and why they are important and should be adhered to.

The recommended immediate action for the conservation of species targets is:

- Develop and agree on the rules for the management of target species indicating harvesting rules and hunting bans or hunting seasons for particular species

5.3. MANAGEMENT OF INVASIVE SPECIES

Invasive species are a major threat to the native biodiversity in the project site and the most damaging invasive species should be managed in the CA.

An effective way to manage invasive weeds is via habitat restoration. Areas planted with fast growing native species quickly shade out weeds. If the right species are planted and in the right density, weeds can be suppressed within 2 years.

The recommended immediate actions for managing invasive species are as below:

- Raise awareness on the impacts of invasive species and the importance of their management
- Manage the spread of invasive plants by physical removal and forest restoration (strategy 1)

5.4. RESEARCH THE VAIGAFA ANCIENT VILLAGE AND DEVELOP ECOTOURISM ACTIVITIES

Ecotourism development has long been promoted in Samoa as form of sustainable and appropriate development in Samoa. The Vaipu Swamp has some potential for development of ecotourism such as a loop board walk through the swamp, perhaps linked to the restoration of the ancient Vaigafa village.

The recommended immediate actions to improve the development of ecotourism in the CA are:

- Conduct archaeological research on the Vaigafa ancient village;
- Determine tourism potential of the site;
- Develop a costed strategy and workplan for any recreational development of the CA including trails and signage;
- Conduct training and capacity building of local communities in sustainable ecotourism linked to knowledge of biodiversity and archaeological sites.

5.5. CAPACITY BUILDING AND IMPROVEMENT IN ENVIRONMENTAL AWARENESS AND CONSCIOUSNESS

The Vaipu Swamp CA community must be trained to implement this management plan. Training will be needed in forest restoration, tree planting as well as in site surveys, signage and trails development. MNRE will need to facilitate the training in collaboration with partners such as the Vaipu Swamp Conservation Committee, the National University of Samoa and the Samoa Conservation Society.

There is a general lack of public environmental awareness or appreciation of the critical values of native biodiversity and habitats in Samoa (especially swamp areas), as well as the linkages and relationships between species and ecosystems, the threats to species and the steps needed to enhance natural heritage and thereby safeguard cultural heritage and promote sustainable development.

The recommended immediate actions to build capacity and improve environmental awareness in the Vaipu Swamp CA are to:

- Provide training for community members in CA management, forest conservation, restoration, identification of fauna and flora and implementation and monitoring of project activities;
- Develop an environmental awareness program to improve the understanding by CA communities of the values of the CA and on the importance of the CA rules;
- Develop awareness material on the project and on the value of the CA- such as posters, brochures, postcards for sale etc.

6. CA MANAGEMENT RULES and PENALTIES

6.1. GENERAL CA MANAGEMENT RULES

A summary of the proposed management rules in the CA is shown in Table 6 below.

Table 6. Proposed Vaipu Swamp CA Management Rules

Rule Number	English version
1	No logging in the CA
2	No new gardens allowed in the CA
3	No harvest of native species protected under law in the CA (i.e. pigeons, flying foxes)
4	Allow hunting of pigs in the CA with guns
5	No littering in the CA
6	No new livestock to be introduced to the CA
7	No new invasive species to be introduced to the CA
8	No activities allowed that will cause degradation to ecological, hydrological, geological, cultural or scenic features in the CA
9	No commercial activities such as tours, tour facilities, trails etc in the CA to be developed without the permission of the CA management committee

6.2. RULES FOR VISITORS TO THE CA

- Visitors must respect all the CA rules including a no litter policy
- Visitors must always respect traditional Samoan customs including appropriate dress, activities on Sunday, etc

7. SUMMARY of recommended CONSERVATION ACTIONS and PRIORITIES

A summary of the recommended conservation actions, responsibilities, timing and priority is shown in Table 7. Timing is grouped into immediate (for the next 12 months), and mid- term (within the next 12 to 24 months). Priority is considered high or medium. An approximate budget for the first two years is also provided but detailed budgets will need to be developed at the project implementation phase.

Table 7. Summary of recommended conservation actions, responsibilities, timing and priority.

Strategy and Action	Responsibility	Timing	Priority	Approximate budget (WST)
Forest Conservation and Restoration				
1.1 Develop and agree on the rules for the management of the CA indicating allowable and non-allowable activities (e.g. logging, farming, hunting of native birds)	Communities with support of MNRE and NGO partners	Immediate	High	5,000
1.2 Place signs in the CA explaining the management rules	Communities with support of MNRE and NGO partners	Immediate	High	5,000
1.3 Implement restoration and weed management in degraded areas (ie planting with native trees)	Communities with support of MNRE	Mid term	High	20,000
2.Conservation of threatened species				
2.1 Develop and agree on the rules for the management of target species indicating harvesting rules and hunting bans or hunting seasons for particular species	Communities with support of MNRE and NGO partners	Immediate	High	Costed under 1.1
3. Management of invasive species				
3.1 Raise awareness on the impacts of invasive species and the importance of their management	MNRE and NGO partners	Immediate	High	10,000
3.2 Manage the spread of invasive weeds by physical removal and forest restoration	MNRE and NGO partners	Immediate	High	Costed under 1.3
4. Research the Vaigafa ancient village and develop ecotourism activities				
4.1 Conduct archaeological research on the Vaigafa ancient village and determine tourism potential of the site	MNRE and National University of Samoa	Mid term	Medium	115,000
4.2 Develop a costed strategy and workplan for ecotourism development of Vaipu Swamp CA	MNRE and Samoa Tourism Authority	Mid term	Medium	5,000
4.3 Conduct training and capacity building of the community in sustainable ecotourism	MNRE and Samoa Tourism Authority	Mid term	Medium	10,000
5. Capacity building and improvement in environmental awareness and consciousness				
5.1 Provide training for community members in CA management, forest conservation, restoration, identification of fauna and flora and implementation and monitoring of project activities	MNRE and NGO partners	Immediate	High	10,000
5.2 Develop an environmental awareness program to improve the understanding by project communities of the values of the CA and on the importance of the CA rules	MNRE and NGO partners	Immediate	High	10,000
Budget (first 2 years)				**200,000 (85,000 WST without 4.1)**

8. MONITORING

Basic monitoring indicators and means of verification are shown in table 8 below. It is assumed that the MNRE Forestry Division will lead on the monitoring work in collaboration with village communities.

Table 8. Summary of monitoring indicators and means of verification

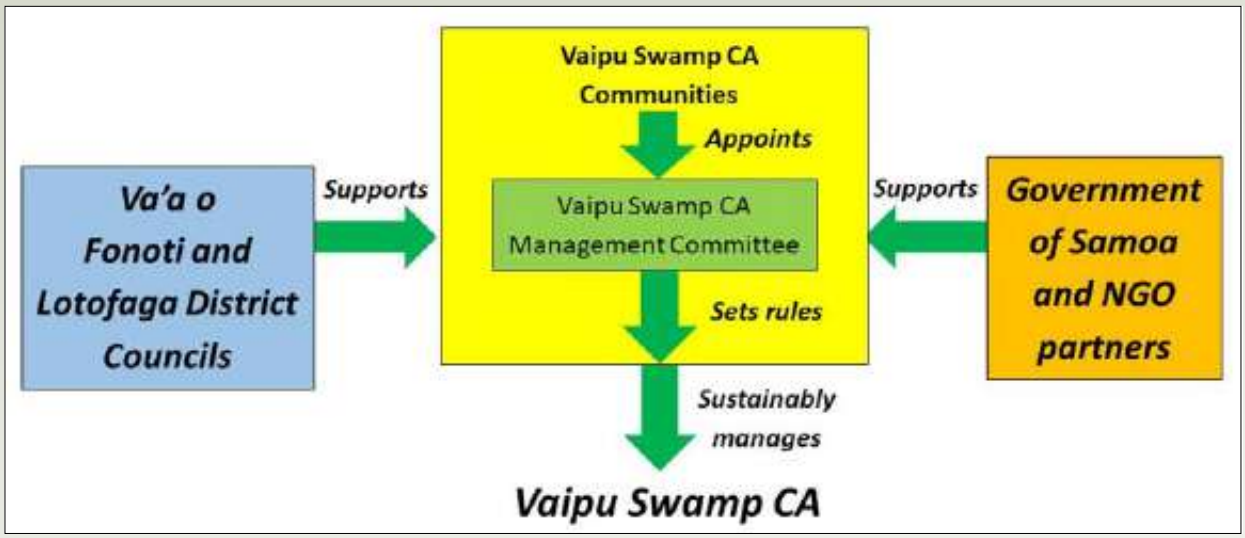
Strategy and Action	Indicator	Means of verification
1.Forest Conservation and Restoration		
1.1 Develop and agree on the rules for the management of the CA indicating allowable and non-allowable activities (e.g., logging, farming, hunting of native birds)	Meeting where rules are all agreed	Meeting report
1.2 Place signs in the CA explaining the management rules	Signs designed and constructed	Signs installed
1.3 Implement restoration and weed management in degraded areas (i.e., planting with native trees)	Area restored Trees planted	Mapping of areas restored and count of trees planted
2.Conservation of threatened species		
2.1 Develop and agree on the rules for the management of target species indicating harvesting rules and hunting bans or hunting seasons for particular species	Meeting where rules are all agreed Surveys of threatened species	Meeting report Survey report
3.Management of invasive species		
3.1 Raise awareness on the impacts of invasive species and the importance of their management	Training course conducted	Training report
3.2 Manage the spread of invasive weeds by physical removal and forest restoration	Area restored Trees planted	Mapping of areas restored and count of trees planted
4. Research the Vaigafa ancient village and develop ecotourism activities		
4.1 Conduct archaeological research on the Vaigafa ancient village and determine tourism potential of the site	Research conducted	Survey report produced
4.2 Develop a costed strategy and workplan for ecotourism development of Vaipu Swamp CA	Consultant hired Ecotourism options assessed	Ecotourism strategy produced
4.3 Conduct training and capacity building of the community in sustainable ecotourism	Training course conducted	Training report
5. Capacity building and improvement in environmental awareness and consciousness		
5.1 Provide training for community members in CA management, forest conservation, restoration, identification of fauna and flora and implementation and monitoring of project activities	Training course conducted	Training report
5.2 Develop an environmental awareness program to improve the understanding by project communities of the values of the CA and on the importance of the CA rules	Consultant hired Awareness programme developed	Awareness material produced

9. INSTITUTIONAL ARRANGEMENTS

9.1. CA GOVERNANCE

The proposed CA governance arrangements are shown in Figure 6.

Figure 6. Proposed Governance Arrangements for the CA



Vaipu Swamp CA Management Committee
A CA Management Committee needs to be appointed to oversee the management of the CA and set all CA rules. It is possible that the committee will report to the Va'a o Fonoti and Lotofaga District Councils and may be part funded by these district councils.

The CA Management Committee should have representation of all the landowning communities in the CA and must also reflect traditional governance arrangements. Ideally all sectors of society including women and youth as well as chiefs would be represented in the committee. The specific functions and implementing rules and regulations of the committee and the duties and responsibilities of committee members need to be determined, but the proposed roles of this committee are to:

- Endorse the CA management plan
- Supervise the implementation of the management plan with the support of project partners
- Make decisions on all management plan strategies, actions, rules, laws and fines in the CA
- Mediate, arbitrate and to decide in any complaints or grievances
- Manage funds raised for the implementation of all CA management activities

9.2. PARTNER ROLES

Government of Samoa partners
The proposed roles of government partners to support the implementation of the management plan are shown in Table 9.

Table 9. Proposed roles of Government partners to support the implementation of the plan

PROJECT PARTNER	PROPOSED ROLE
MNRE	Provide support to the Vaipu Swamp CA Management Committee to develop and implement restoration plans and to monitor and manage biological resources in the CA and in particular to: • Assist with fundraising to implement the plan • Assist with monitoring and management of biological resources in the CA • Conduct environmental awareness activities related to biological resources in the CA • Help the Vaipu Swamp CA Management Committee to liaise with other partners including donors, other government departments and NGOs
Samoa Tourism Authority	Provide support to the CA communities and the Vaipu Swamp CA Management Committee to manage and monitor tourism activities in the CAs and in particular to: • Assist with monitoring and management of tourism in the CAs • Assist with capacity building for sound and sustainable tourism development in the CAs • Help the Vaipu Swamp CA Management Committee to liaise with other partners including donors, other government departments and NGOs
National University of Samoa	Provide support to the CA communities and the Vaipu Swamp CA Management Committee to conduct an archaeological ground survey and excavations at the Vaigafa ancient village. Any datable material recovered from the excavations will be analysed and carbon dated and data collected will be shared with project partners. NUS will also complete a literature review/desktop survey and collect oral traditions associated with Vaigafa from stakeholder communities

Non-government partners

National and International NGO partners and donors will be requested to support the implementation of this plan. There are two national environmental NGOs in Samoa- O le Siosiomaga Society Inc (OLSSI) and the Samoa Conservation Society (SCS). These and other NGO partners will be asked to provide support to the CA communities and the Vaipu Swamp CA Management Committee to perform relevant activities based on NGO mandates and skills- eg for research and monitoring, invasive species management, awareness raising, forest restoration, tourism development etc.

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Faamolemole faatuatusi uma mai fesootaiga uma i le Ofisa Sili

Mafutaga ma Itumalo o Fagaloa ma Lotofaga mo le faalauiloaina ole Ta'iala o Fuafuaga mo le Laufanua Vailaloa I Vaipu (Fusiluaga)";
Aso Faraile 20th Ianurari 2023, 9am; TATTE Convention Centre.

	Igoa	Afioaga	Itupa (Alii/Tamaitai)		Telefoni	Saini	
1	Fagaga Aoiga	Samamea	✓		7366197	Fagaga	$30 Fagaga
2	Anovale Masani	Taelefaga		✓	7594590	[signature]	[signature] $30
3	Faguaa Lia	Samamea		✓	7774878	[signature]	$30
4	Peke Moega	Taelefaga		✓	7716084	[signature]	[signature] $30
5	Petesa Karauna	Samamea		–	7712528	[signature]	[signature] $30
6	Anu Tofaoiali'i	Samamea		–	7716684	Anu	Anu $30

			M	F			
7	Fui Siala.	Sauvauea.	✓		760 6238	Fiala	$30.
8	Leaega aele Sefo	Lotofaga	✓		7783228	Fitio	
9	Seata Leaega	"		✓	✓	[illegible]	
10	Faatoga. Fatu.	"		✓	7620823.	F.Fatu.	F.Fatu.
11	Sagapolu	Lona		✓	7642764 7225327	S. Bruce	$30- Bruce
12	Lagi Kolose	Maasina		✓	7718573	Lagi Kolose	$30 Lagi Kolose
13	VAIPUA TUIAVI'I SETU.	UAFATO	✓		7605200	V. Tuiavi'i	$30
14	James Atherton	Consultant	✓		7770787	[illegible]	
15	[illegible]	Lona.	✓		790988.	Kolo	$30
16	Soi Sefo	Lotofaga	✓		751 1541	Sefo Soi	Soi $30
17	Anthea Adam	CI intern		✓		AAdam	
18	Nitesona	Lotofaga	✓		7506368	Nitesona	$30

	AFIOAGA SUAFA	AFIOAGA	M	F	TELEFONI	SAINI	
19	Simalu. Titi	Taelefaga		✓	7342715	[signature]	[signature] $30
20	Masi Levi Hunt	Lotofaga	✓		7508197	M.L.Hunt.	
21	Alhenese Lotu	"		✓	7171952.	[signature]	Alhenese
22	Lemaluga Fiso	"	✓		7613746	[signature]	
23	Otila. Fruean	Lotofaga		✓	7593272	O.Fruean	O.Fruean $30
24	Manoa. Vaeva	Uafato	✓		7518010	[signature]	Manoa V.
25	Fuatele Seetini	Salimu Fagaloa	✓			[signature]	$30.
25	S. Tagata. E.	Lotofaga	✓		7766270	[signature]	[signature] $30
26	Raeta. A.	Lona.		✓	7617833	R.A	R.A $30
27	Satoa Halio	Saletele	✓		7284374	[signature]	[signature] $35
28	Levene Tago	MNRE		✓	—	[signature]	
29	Mugatutia	Salimu.			7248205	[signature]	

	Igoa	Afioaga	M	F	Telefoni	Saini	
30	Audra.	Salimu		✓	7757128	[signature]	[signature]
31	Mongo	Vailele		✓	7162777	[signature]	
32	LEUUMASANI	Taelefaga	✓		7758617	[signature]	[signature] $30
33	Tenesia Petelo	Lotofaga.	✓		7681982	[signature]	$30 [signature]
34	Dr Matavai Tautunu	NUS	✓		7231953	[signature]	
35	Moega Sone.	Taelefaga.	✓			[signature]	$30.
36	Grace Laulala	MNRE		✓	—	[signature]	
37	Hiroshi	MNRE	✓		67200	[signature]	
38	Entole Simanu	MNRE		✓	67200	[signature]	
39	Alailefua Salesa	Ulafato	✓		7595297	[signature]	$30
40	Leota Valoaga.	Taelefaga			7722353	[signature]	
41	Musu Faamolu	Lotofaga	✓	—	7516893	[signature]	[signature] $30

42	Kotofaga					
43	Oloialii Kok	Kotofaga	M.		7581538	[illegible]
44						

Traditional fee

45	Saloa 21alio	Saleteli			7281437K	[illegible]	$50
46							
47							
48							
49							
50							
51							
52							

Government of Samoa

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Aso Faraile 20th Ianurari 2023, 9am; TATTE Convention Centre.

	Igoa	Afioaga	Itupa (Alii/Tamaitai)		Telefoni	Saini	TRANSPORT ALLOWANCE
1	Benjamin Fauono Limutau	Sauano	✓		767-4297	[signature]	x [signature] $...
2	Vaimoa Lagimaina	Sauano		✓	7653928	[signature]	[signature] $30.
3	Ufuemalie Leaiuaialii	Sauano		✓	7754500	[signature]	[signature] $30
4	Miriama Silito Fuai	Salefele		✓	7173121	[signature] $30	x [signature]
5	Mealuai Faaletatau	Taelefaga		✓	7797436	[signature] $30	x [signature]
6	Faaeteete Sanerini	Taelefaga		✓	7255169	[signature] $30	x [signature]

	Igoa	Afioaga	M	F	Telefoni	Saini	Transport Allowance
7	LEAO TALALELEI TUITAMA	MAASINA/FAGALOA	✓		7780688	[signature]	$30 [signature]
8	Samoa Malaki	Maasina/Fagaloa		✓	7570291	[signature]	[signature]
9	Mariana Filo	Sauano/Fagaloa		✓	7674297	Mariana Filo	[signature]
10	Siasulu Limutaue	Sauano/Fagaloa		✓	7674297	Siasulu Limutaue	[signature]
11	Lita. Feifai	Salimu. Fagaloa		✓	7787104	LP $30 –	[signature]
12	Senetina Chan	Salimu Fagaloa		✓	7674418	Senetina	[signature]
13	Faalelei Molimau	Uafato Fagaloa		✓	711858	[signature] $30	[signature]
14	Lina-Simeavao	Uafato Fagaloa		✓	7595594	L.S. $30	L.S.
15	Aumarana Leyau	Matafufu	✓		7709170	[signature]	×
16	Nellie Sitama	Lotofaga		✓	7506368	[signature]	Nellie S
17	Taefoi Faalupega.	Lotofaga		✓	778-2181	[signature]	[signature]
18	Vaisea S.	Uafato.	✓	×	759-5594	[signature]	$30 [signature]

	Igoa	Afioaga	M	F	Telefoni	Saini	Transport Allowance
19	Maima Paresoo.	LONA. FAGALOA.		✓	7649093.	[signature]	M.P. $30
20	SENE. ALIU	LONA. FAGALOA		✓	7206093.	S Aliu.	X
21	Sikao.	LONA.F.	✓			S. $30.00	[signature] ✓
22	[illegible]		✓		729-6342	[signature]	
23	Mamumailagi	Saletele.		✓	7281372	[signature]	X
24	Vaese Kava	Sauano		✓	7615708	[signature]	[signature] $30
25	Ioane Limutau	"	✓		"	[signature] $30	[signature]
25	Falalei Enoka	MNRE DE	✓		1509595	[signature]	X
26	April	MNRE FD		✓	67000	[signature]	X
27	Sera	MNRE CSD		✓	67200	[signature]	X
28							
29