

FA'ASAO LE
MANUMEA
SAVE THE MANUMEA



March 2020

RECOVERY PLAN 2020-2029

MANUMEA | TOOTH-BILLED PIGEON
(*Didunculus strigirostris*)



Ministry of Natural Resources
and Environment
Matagaluega o le Puna'oa
Faalenatura ma le Siosiomaga



SAMOA CONSERVATION
SOCIETY
SOSAIETE FAASAO
O SAMOA

INTRODUCTION TO RECOVERY PLANNING

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

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

This plan will guide the Division of Environment and Conservation (DEC) of the Samoa Ministry of Natural Resources and Environment (MNRE) and the Samoa Conservation Society (SCS) in their efforts to support the conservation of Samoa's national bird, the Manumea (Tooth-billed Pigeon/*Didunculus strigirostris*), and its natural habitats, the rainforests of Samoa.

The plan also provides an opportunity for other organizations with an interest in the Manumea to identify how they can support the conservation of the bird. The establishment of a Manumea Conservation Working Group is proposed to lead the implementation of the plan over the next 10 years. Such a model is necessary to be able to respond to the continuing evolution of conservation management approaches for Manumea as new information become available. Comments and suggestions on the plan are welcomed and should be directed to the Manumea Conservation Working Group via the MNRE.

The format of this plan is based on guidelines produced by the New Zealand Department of Conservation. The plan is due for review in 2024-2025, or sooner if new information signals the need for a change in approach. The plan aligns with the Samoa National Biodiversity Strategy and Action Plan (2015-2020)'s Strategic Goals B (reduce the direct pressures on biodiversity and promote sustainable use), C (improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity) and E (enhance implementation through participatory planning, knowledge management and capacity building).

FOREWORD

On behalf of the Government of Samoa I am happy to endorse this 10 year Recovery Plan (2020-2029) for the conservation of our national bird, the Manumea, or Tooth-billed Pigeon. This new plan replaces and updates an earlier Manumea Recovery Plan (2006-2016) and is based on an assessment of the implementation of the earlier plan and a revision of the priorities required to save the Manumea from extinction.

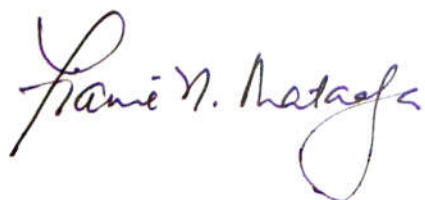
The Recovery Plan has received significant local input from villages via consultations as well as input from scientists and conservation experts and thus considers all current knowledge of the status of the bird and what is known of its ecology. The plan focusses on a comprehensive suite of conservation actions needed to save the Manumea and complements a one year Manumea Conservation Campaign (2019-2020) that the Government of Samoa has also endorsed which is focused on human behavior change, in particular managing the threat from hunting.

The current Manumea Recovery Plan includes eight objectives and 26 activities designed to save the Manumea from extinction, including conservation and restoration of key Manumea habitats and ecosystems, control and manage hunting and the threat from invasive predators, increasing knowledge of the status of the bird and its biology, building national pride in the bird plus building local capacity to achieve Manumea conservation.

Together the Recovery Plan and the Manumea Campaign Strategy recognize the role of the Manumea as a “flagship” for conservation effort in Samoa and as a crucial seed disperser in the Samoan rainforest. If the Manumea is saved from extinction then the health and functionality of the forest ecosystem will be saved as well as a whole web of terrestrial biodiversity including plants, birds, reptiles and invertebrates that also live in the rainforest.

Manumea has significant value for Samoan culture and heritage, but most Samoans are unaware that this shy and cryptic bird is now classified by the IUCN as Critically Endangered, with perhaps less than 100 individuals surviving. There is also some poignancy that the Manumea is one of the last living relatives of the Dodo, a bird that has been extinct since 1681 and an icon of oceanic island extinctions.

The Government of Samoa will do all it can to ensure this plan is implemented. Additionally, it asks all Samoans and our local and international partners to support implementing the plan. With concerted and coordinated effort it will be possible to manage the threats that are imperiling Samoa's national bird, and ensure that the Manumea will continue to live to share its essential ecological role, beauty and unique evolutionary history for current and future Samoans.



Hon. Fiamē Naomi Mata'afa

Deputy Prime Minister of Samoa and Minister for
Ministry of Natural Resources and Environment.



Manumea mural at Salelologa market, Savaii with the mural artists.
Photo courtesy of Jane Vaafusuaga.

EXECUTIVE SUMMARY

The critically endangered Manumea or Tooth-billed Pigeon is found only in Samoa and is highly significant in its cultural heritage. This pigeon only lives within and on the edges of intact mature native forest. Its numbers appear to have dropped dramatically during the last 10-15 years, mostly through loss of habitat, hunting and possibly due to the impact of introduced invasive predators. There is currently consensus among the experts that this species is in dire need of immediate conservation action if its extinction is to be prevented.

Despite considerable search efforts, Manumea has only been definitely detected in the field a few times in the past 10 years. The Manumea has been listed as Critically Endangered by the World Conservation Union since 2014 and is now considered to be in serious danger of extinction. A review of the Manumea Recovery Plan 2006-2016 concluded that “there may not be another decade to save the national bird of Samoa”. A stepping up of efforts, compared to the previous decade, is clearly needed. The present document represents the Manumea Recovery Plan for the period 2020-2029.

Village consultations conducted between 2016 and 2019 showed strong interest and commitment to conserve the species. Two national consultations held to present a draft Recovery Plan in October 2019 expressed support for its implementation and a need for capacity building and awareness for village communities to play and strengthen their key role in conservation efforts.

The goal of the Recovery Plan is to ensure that the Manumea is no longer in danger of extinction, with secure populations on Upolu and Savaii, and the bird is returned to many different forest areas. It aims for the majority of Samoans to recognize and value the Manumea as a key part of their natural heritage and to play their part in its conservation.

The 10-year plan, whose estimated total budget is approximately USD\$1,810,000 has eight objectives and 26 activities. The first objective is to create the relevant governance and funding conditions which will enable the implementation of the Recovery Plan. The second is about communities preserving and restoring those forests where Manumea has been seen during the past 10 years (Manumea Key Rainforest Areas-MKRA), found both in Upolu and Savaii.

The third and fourth objectives focus on the control and mitigation of the other two key threats to Manumea survival: hunting and invasive predators. Objective 5 promotes the increase of knowledge about the ecology and behavior of Manumea while implementing conservation efforts. This includes as a priority learning how to separate its advertising call from that of the Pacific Imperial Pigeon or Lupe (*Ducula pacifica*).

The sixth objective is about initiating a programme of captive breeding, providing conditions are suitable and if regarded as feasible, realistic and appropriate. The seventh and eighth objectives focus on raising awareness and promoting behavior change in support of the ongoing Manumea Conservation Campaign (2019-2020) and training national staff in Manumea conservation.

The comprehensive work plan encourages and promotes the support of all interested organizations and individuals. Collectively the plan, if implemented effectively, will give the Manumea a fighting chance for a long-term future. But prompt action is needed, starting from proper institutional arrangements and the mobilization of sufficient funds.



Manumea painting © M. Rothman 2013.

The following are the actions listed in the proposed recovery plan as of immediate priority that are recommended to be performed during the next 1-2 years:

- Appointment of a Threatened Species Focal Point within MNRE/DEC
- Establish an operational Manumea Conservation Working Group (MCWG) coordinated and led by MNRE/DEC with key assistance from partners
- Launch and implement a 2-year fund raising campaign
- Recruit a Manumea Conservation Coordinator as soon as sufficient funds are raised with a role to coordinate and manage conservation activities on the ground
- Develop detailed site and community profiles and engagement plans for each MKRA; define its preliminary proposed boundary based on updated forest quality maps
- Support and monitor locally enforced bans on hunting; work with communities in MKRAs to discuss and put new local measures in place
- Develop and trial a reliable method/s to identify Manumea in the field
- Support the implementation of the on-going Manumea Conservation Campaign (MCC) 2019-2020 and link this campaign with on-the-ground conservation

TABLE OF CONTENTS

INTRODUCTION TO RECOVERY PLANNING	i
FOREWORD	ii
EXECUTIVE SUMMARY	iv
ACKNOWLEDGMENTS	viii
GLOSSARY	ix
1. BACKGROUND	1
1.1 Introduction	1
1.2 Significance	2
1.3 Status	3
2. DISTRIBUTION AND POPULATION TRENDS	4
2.1 Past Distribution	4
2.2 Present Distribution	4
2.3 Population Trends	6
3. ECOLOGY AND BEHAVIOUR	7
4. CAUSE OF DECLINE AND CURRENT THREATS	9
5. PAST CONSERVATION EFFORTS	11
5.1 Technical work	11
5.2 Community level	12
6. RECOVERY PLAN	14
6.1 Vision, Goal and Objectives	14
6.2 Recovery Plan Workplan	15
LITERATURE CITED	24
ANNEX 1	28
DEFINITE OBSERVATIONS OF MANUMEA BETWEEN 2009-2019	
ANNEX 2	32
PROCESS FOR DEVELOPING THE MANUMEA RECOVERY PLAN	
ANNEX 3	34
FEEDBACK FROM CONSULTATIONS IN SAVAII AND UPOLU, 7 AND 10 OCTOBER 2019	
ANNEX 4	36
DRAFT TERMS OF REFERENCE FOR THE POSITION OF “THREATENED SPECIES FOCAL POINT”	
ANNEX 5	37
DRAFT TERMS OF REFERENCE FOR THE STRUCTURE OF THE “MANUMEA CONSERVATION WORKING GROUP”	
ANNEX 6	39
DRAFT TERMS OF REFERENCE FOR THE POSITION OF “MANUMEA CONSERVATION COORDINATOR”	

ACKNOWLEDGEMENTS

Development of this Recovery Plan was coordinated by Dr Gianluca Serra with funding from the Auckland Zoo's Conservation Fund facilitated by the Samoa Conservation Society. We would like to thank the many individuals who contributed to the plan development including Sian Buley, Greg Sherley, James Atherton, Seumalo Afele Failagi, Moeumu Uili, Czarina Stowers, Laulu Fialelei Enoka, Mark O'Brien, Ulf Beichle, Sabine Baumann, Richard Gibson, David Butler, Karen Baird, Jane Va'afusuaga and Peter Luscomb. Greg Sherley and James Atherton edited and laid out the final document.

We acknowledge the support of the Division of Environment and Conservation of the Ministry of Natural Resources and Environment throughout the development of the plan. We would also like to thank all the experts who attended the expert roundtable in Apia in October 2019 or provided comments via email as well as the representatives from village communities on both Upolu and Savaii, including Uafato, Faleaseela, Falealupo, Aopo and Tafua who participated in the Recovery Plan discussions.

Recommended citation: MNRE and SCS (2020). Recovery Plan for the Manumea or Tooth-billed Pigeon (*Didunculus strigirostris*) 2020-2029. Ministry of Natural Resources & Environment, Government of Samoa and Samoa Conservation Society. Apia, Samoa. 50 pp.

Recovery plan graphic design by Aleisha Elmsly, Auckland Zoo.



A juvenile Manumea. Photo courtesy of Ulf Beichle.

GLOSSARY

BIORAP	BIODiversity Rapid Assessment Program
DEC	Division of Environment and Conservation (of MNRE)
GEF	Global Environmental Facility (a trust fund of the United Nations)
KBA	Key Biodiversity Area (<i>sensu</i> Conservation International 2010)
MCC	Manumea Conservation Campaign
MKRA	Manumea Key Rainforest Areas
MNRE	Ministry of Natural Resources and Environment (of Samoa)
MRP	Manumea Recovery Plan
NGO	Non-Governmental Organization
RARE	Center for Tropical Conservation (NGO)
SCS	Samoa Conservation Society
UNDP	United Nations Development Programme
SMSMCL	Strengthening Multi-sectoral Management of Critical Landscapes (MNRE/GEF/UNDP Project)



1. BACKGROUND

1.1 Introduction

The Tooth-billed Pigeon (*Didunculus strigirostris*) is locally known as “Manumea” meaning “red-brown bird” in the Samoan language (MNRE 2006, Beichle and Baumann 2016). Due to its cryptic and elusive behaviour the Manumea is also called “Manuma” or “shy bird” (MNRE 2006, Collar 2015, Serra et al. 2017).

Manumea is an endemic bird from the archipelago of Samoa. It is known to occur, or have occurred, in the islands of Upolu, Savaii and Nuutele (Beichle 1987, 1991; Freifeld et al. 2001), all part of the archipelago that is governed by the independent state of Samoa (once known as Western Samoa).

In evolutionary terms, Manumea is a distinctive species at a global level (Jetz et al. 2014) and is listed as “Critically Endangered” by the IUCN’s Red List (Birdlife 2015). It is a stout, short-toed and multi-coloured pigeon, especially during the breeding season (Beichle and Baumann 2016), whose habitat is the primary rainforests of the Samoan archipelago.

Manumea’s Latin specific name “strigirostris” refers to the hook in the bill which is unique within the Columbidae Family. The lower maxilla of the bill is red at the base and orange-yellow with black at the tip. Also it is shorter than the upper one having several notches along its cutting edge which gives the bird its English common name “tooth-billed pigeon” (Beichle and Baumann 2016).

The head, neck and mantle of the Manumea are glossy blackish green. The back, rump, chest, tail and wing coverts are chestnut brown and the flight feathers are dark brown. The underparts are blackish-brown merging into chestnut under the tail. Legs are dark red. Sexes are similar though the female plumage is duller (Watling 2001).

1.2 Significance

Cultural. Pigeons are very important in the Samoan culture (Bennet 1862). The complex and elaborate imagery of Samoan language includes several proverbs and metaphors related to pigeons and the art of hunting pigeons in the traditional way (using arrows, nets and lures) (Stair 1897). Reportedly in the past the meat of the Manumea was reserved for the high chiefs of the villages and its feathers were used as decorations (Appleton 1871). In the 1990s Manumea became the national bird of Samoa. Today Manumea features on the 20 tala note and on 50 sene coins.

Ecology. The three species of native frugivorous pigeons of Samoa [Manumea, the Pacific Imperial Pigeon or Lupe (*Ducula pacifica*), and the Metallic Pigeon or Fiaui (*Columba vitiensis*)] all play a vital ecological role for the functioning and health of rainforests by dispersing seeds. This function is also performed by the two native species of doves and the two species of fruit bats (Cox et al. 1991; Beichle and Baumann 2016). In the past, pigeons were much more abundant within the Samoan islands than today (Bennet 1862, Armstrong 1932) providing an important food source for villagers (Appleton 1871, Collar 2015). Nowadays pigeons, especially Lupe, seem to be hunted mainly as gifts for special celebrations. An example is the most popular Samoan festivity known as “White Sunday” in October (Stirnemann et al. 2017, Serra et al. 2017).

Evolutionary. Manumea is one of the Pacific region’s conservation icons (Pratt and Mittermeier 2016). The species is remarkable and unique globally from a scientific and conservation stand point. It ranks 16th among bird species worldwide in terms of evolutionary distinctiveness and rarity (Jetz et al. 2014). Its genus *Didunculus* is unique in the world because of the distinctive shape of its bill which makes it very different from all other extant pigeons. Another species identified in the same genus is the larger and now extinct Tongan Tooth-billed Pigeon (*Didunculus placopedetes*) which is only known from Quaternary fossil remains (Steadman 2006). *Didunculus* means in Latin ‘little dodo’ which makes Manumea further remarkable as it is one of the three only surviving relatives of the icon of oceanic extinctions - the Dodo (*Raphus cucullatus*) (Shapiro et al. 2002).

1.3 Status

The Manumea is Samoa's most endangered bird (Pratt and Mittermeier 2016). It was up-graded to Critically Endangered in the 2014 IUCN Red List (BirdLife International 2015) whereas it was previously listed as Endangered between 2000 and 2014.

The critical state of the Manumea was brought to the attention of the conservation community by Beichle (2006) who reported that only a "few hundred" birds survived at the time, implying a 90% reduction in numbers since the last estimate he had carried out in the mid-1980s (Beichle 2006, Beichle and Baumann 2016).

The perilous conservation status of Manumea was confirmed by a survey in 2012 of the species' presumed stronghold in the remote uplands of Samoa's largest island, Savaii, in which no Manumea were observed (Butler 2012).

Based on surveys run in 2012-2013 fewer than 50 individuals for each of the two main islands were estimated (Birdlife 2014). In fact, during the past 10 years there have been only a few definite visual identifications of the bird from 2 different sites in Upolu (Uafato and Malololelei) despite the intensive search efforts carried out (Annex 1). In Savaii a few identifications of Manumea calls were made in Taga and in Aopo, and one definite sighting in Falealupo, by selected reliable hunters (sensu Serra et al. 2017) in 2016-2018 (see also Annex 1).

2. DISTRIBUTION AND POPULATION TRENDS

2.1 Past Distribution

In the mid 1800s the islands of Samoa were reportedly still covered in lush rainforests, and pigeons were everywhere in the forests and even kept as pets in the villages (Bennet 1862, Armstrong 1932).

Manumea is recognized as being a highly secretive and cryptic species and therefore hard to see in the canopy of rainforest. Despite this, there is consistency between Ulf Beichle's observations and those recorded from selected reliable hunters (Serra et al. 2017) which describe Manumea being infrequently encountered in the rainforest up until around the mid 1980s.

According to Beichle's 1987 estimate, based on the call identification, there were 1600-2400 individuals in Upolu and 3200-4800 in Savaii in the late 1980s or a total for all of Samoa of 4800-7200 birds. Subsequently Beichle's estimate dropped to 500 birds for both islands in 2005-2006 (Beichle 2006).

However, recent research has concluded that the Manumea's call is indistinguishable from a secondary call of the relatively common Lupe (Beichle and Baumann 2016, Pratt and Mittermeier 2016, Serra 2016). Hence, past population size estimates for Manumea most probably include Lupe numbers; in all probability therefore, also the Lupe's population most likely dropped dramatically between the first Beichle's estimate (late 1980s) and 2006.

2.2 Present Distribution

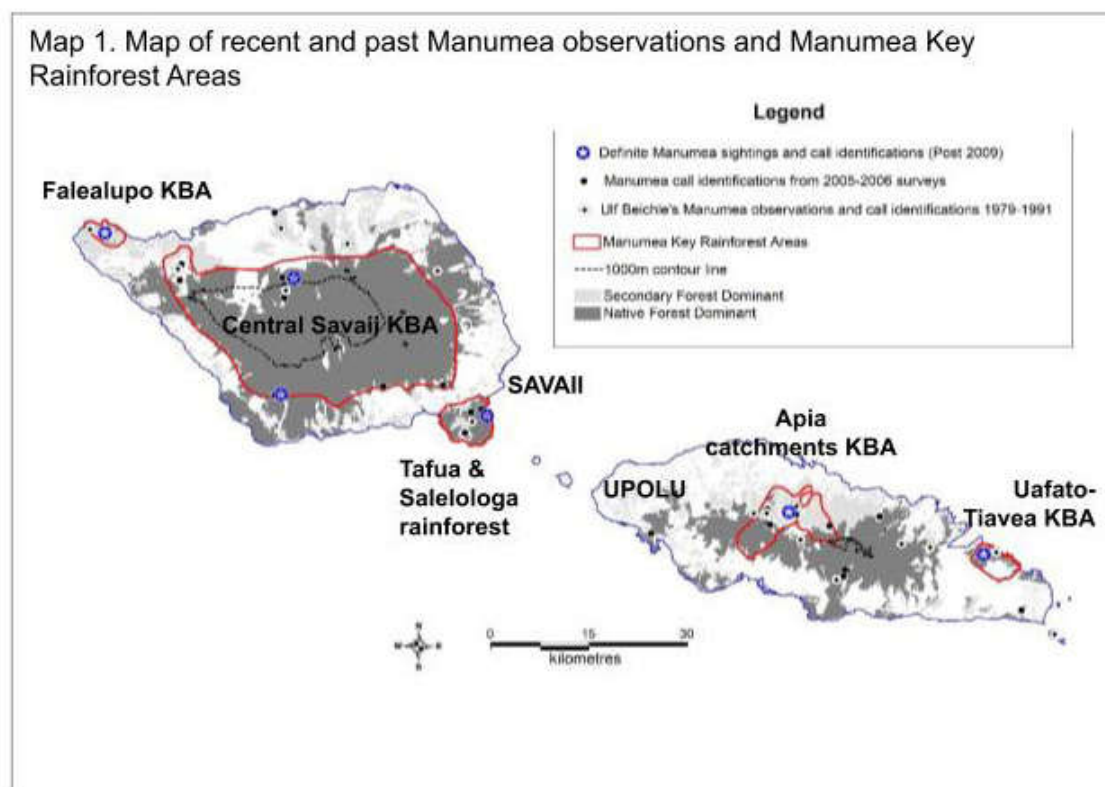
A couple of decades following the only field study dedicated to Manumea was completed - by Ulf Beichle in the late 1970s through to the 1980s (Beichle 1982a,b, 1987a,b, 1989, 1991) the species became so rare that it was re-categorised as Critically Endangered. During the past decade it was realized that it had become virtually impossible to find one individual in the field without spending considerable time searching for it. As Collar (2015) put it: "The great difficulty throughout this century has simply been to find even a single representative of the species [...]".

Serra et al. (2017) calculated the current likelihood of success sighting a Manumea within the most suitable habitat based on data reported by F. Enoka, R. Stirnemann, D. Butler and G. Serra relative to the period 2006-2017. They estimated one definite sighting was possible every 3 to 5 years, based on a medium to intensive search effort.

The last definite and confirmed sighting of a Manumea is from the Uafato forest on 4 August 2017 (G. Serra, pers. comm.). A juvenile Tooth-billed Pigeon, photographed in Savaii in December 2013 (Uili 2014), provided the first certain recorded documentation this century and indicated that the species was still breeding at the time.

In mid October 2019 Serra (2019) intensively searched without success for about 35 hours over 5 days the presumed “best” forests in Upolu and Savaii from which Manumea have been seen in recent years.

For the purpose of recovery planning, Manumea Key Rainforest Areas (MKRAs) are indicated as those areas where definite sightings of the species have occurred during 2009-2019 or where call field identifications were performed by selected reliable Samoan hunters in the same period (Serra et al. 2017). Forest areas with these characteristics are described in details in Annex 1 together with details about the related sightings and call identifications. MKRAs are listed below and their locations illustrated in Map 1.



Upolu

- Uafato-Tiavea KBA
- Apia catchments KBA (Magiagi, Malololelei, Lanotoo)

Savaii

- Central Savaii KBA (Taga and Aopo)
- Falealupo KBA
- Tafua and Salelologa rainforest.

Savaii island is certainly less surveyed than Upolu but harbours a larger extension of high-quality undisturbed forests and a much lower human density/hunting pressure. For these reasons Savaii is suspected to be the stronghold for Manumea in Samoa.

2.3 Population Trends

There are indications that the Manumea population size and abundance fluctuated as early as the second half of 1800s (Collar 2016). Population estimates performed through call-based surveys carried out by Beichle in the mid 1980s, compared with those performed by the same author in mid 2000s (Beichle 2006), indicate a substantial drop in the size of Lupe and Manumea populations.

The consistency of the accounts by Beichle (2006) and of selected reliable hunters (Serra et al. 2017) confirms that the Manumea population plummeted between the mid 1980s and 2006 - perhaps following the two extremely damaging cyclones that hit Samoa in the early 1990s (cyclones “Ofa” in 1990 and “Val” in 1991). During these cyclones forest canopy cover was reduced by an estimated 27% of pre-cyclone levels (Elmquist et al. 1994). An assessment of the impacts of cyclone Val on wildlife reported that ‘populations of pigeons and fruit doves have been decimated’ and stated that they would take years to recover (Lovegrove et al. 1992).

3. ECOLOGY AND BEHAVIOUR

Despite the remarkable field study by Ulf Beichle during the 1980s (Beichle 1982a,b, Beichle 1987a,b, Beichle 1989), the behavioural and ecological knowledge about Manumea remains scant and a good portion of it is still anecdotal and unverified (Collar 2015). All the available information on Manumea was reviewed and summarized by Collar (2015).

The preferred habitat of Manumea seems to be primary native rainforest from coastline to mountain ridge (up to about 900m) with a likely preference for coastal forests (Beichle 1982a and 1987a). Steep slopes as well as flat lowlands, depending on seasonal availability of fruits, are used by Manumea (Beichle and Baumann 2016). It is thought that Manumea follow fruiting trees at different elevations in different seasons (Beichle and Baumann 2016). The absence of large parrots in Samoa coupled up with the distinctive morphology of the Manumea bill has possibly enabled it to occupy a niche that would otherwise be occupied by large parrots in the rainforests of other countries (Collar 2015).

According to Beichle (1987) Manumea has a preference for the fruit of *Dysoxylum* spp. trees (three endemic species occur in Samoa). Beichle (1987a) describes the distinctive morphology of the bill and suggests it is an adaptation for opening the large, hard-coated fruits of *Dysoxylum*. According to the selected reliable hunters interviewed in 2016, Manumea also feeds on several other fruiting trees, including Ma'ali (*Canarium samoense/vitiense*), Moso'oi (*Cananga odorata*), Asi (*Syzygium* sp.), Tavai (*Rhus taitensis*) and others (Serra et al. 2017).

The breeding season for Manumea is thought to be from April to September (or possibly from March to November) (Beichle and Baumann 2016) which normally corresponds to the dry season in Samoa. It has been reported historically that Manumea may at times forage on the ground (Collar 2015) and this has been corroborated recently (D. Butler, pers. obs., Serra et al. 2017).

Beichle (1987) and Gibbs et al. (2001) also speculated that Manumea spends significant time foraging on the ground and perhaps even nesting there. However the only nest of Manumea on record was spotted 25 meters above the ground in a Banyan tree (*Ficus obliqua*) (Beichle 1982a, 1987a). In fact both Beichle and Baumann (2016) and Collar (2015) conclude that Manumea most likely breeds in trees and not on the ground.

Notwithstanding the above it is known that Manumea is secretive – presumably actively avoiding detection by observers. Recently its flight has been described and is considered diagnostic amongst other Samoan pigeons. Its flight is clumsy, slow and typically follows a low trajectory (Serra et al. 2017). Thus its flight pattern is very different from that of Lupe which is typically strong and high, and from the flight of the Fiaui which is also strong but adopts a lower trajectory.

Fiaui is the species most commonly confused with Manumea from the distance and/or in the light conditions encountered in the forest canopy (Serra pers. obs.). This is because Fiaui is a large and dark pigeon and more cryptic and lower flying than Lupe. However, the Manumea can be differentiated from Fiaui from a distance by its distinctive flight pattern and the bigger head and bill.

The advertising coo call of Manumea (sensu Beichle 1991) is almost identical to one of the calls of the still relatively common Lupe. Surprisingly, the similarity in calls between the two species was recognized and described only recently (Beichle and Baumann 2016, Pratt and Mittermeier 2016, Serra 2016) albeit Butler (2012) suggested the similarity earlier.

The “under-appreciated similarity” between the calls of Manumea and Lupe (Pratt and Mittermeier 2016) was clearly apparent in reported traditional ecological knowledge (Serra et al. 2017). The village based experienced hunters selected for the study had an average rainforest hunting history of 28.1 years. They had substantial difficulty distinguishing calls between the two species (Serra et al. in prep). Notably, there was also little agreement differentiating between Manumea and Lupe calls among selected local hunters and government and international experts (Serra et al. 2017). However, these parties do agree that the Lupe’s call occasionally includes an introductory syllable and a modulation during the first third of the call.

4. CAUSE OF DECLINE AND CURRENT THREATS

The three key threats already identified in the previous Manumea Recovery Plan (2006-2016) - habitat loss/degradation, hunting and invasive predators - are still considered to be the main ones negatively affecting Manumea.

Large scale destruction of native forest occurred due to clear felling by the timber industry during the 1970-1980s and also due to major cyclones like those occurring in 1990 and 1991 (MNRE 2006). The vast majority of the most accessible lowland native rainforests have been lost since the 1970s due to commercial logging (MNRE 2006). Since that time the major drivers for forest loss/degradation have been major cyclones and the expansion of villages/infrastructure and agriculture (Beichle and Baumann 2016).

The Samoan forest, even where it survives nowadays, is extremely open and patchy which means that it can support fewer birds and is more vulnerable to invasive weeds (MNRE 2006). This fact may force the last surviving Manumea to move long distances between different forest areas in order to find food.

The Central Savaii KBA includes the largest continuous area of rainforest in the whole tropical Polynesia region (mainly because it is on rough and steep terrain that is challenging to be accessed). However, a good portion of it is 1000m above sea level and is probably not a suitable habitat for Manumea. The remnant sizable patches of lowland rainforests which survive in Samoa are those found in Uafato-Tiavea, Falease'ela/Matafa'a and Nuutele island (Upolu); and Tafua/Salelologa, Aopo and Falealupo (Savaii).

Pigeon hunting has been an ancient tradition of high cultural and socio-economic significance in Samoa (Bennet 1862). Thus hunting Manumea for food has been a long-held customary practice but the impact of non-traditional hunting practices, such as the use of shotguns, has driven the Manumea to the brink of extinction (Beichle and Baumann 2016; Serra et al. 2017; Stirnemann et al. 2017).

Until few decades ago Manumea was targeted together with Lupe. In fact in the 1980s Beichle (1982a) estimated that 400-500 Manumea were killed annually. In recent decades, due to its increased rarity, it appears that Manumea has been killed more by mistake or as a by-catch during Lupe hunting, as explained by selected reliable hunters (Serra et al. 2017) and as suggested by Stirnemann et al. (2017).

In Samoa the hunting of all endemic flying species (pigeons, doves and fruit bats) has been banned since at least 2004 (Protection of Wildlife Regulations 2004), with the threat of a WST5,000 fine (equivalent to ca. USD2300). However, this regulation has never been enforced at a national level and it is largely ignored at the community level.

There is no direct evidence to date showing that rainforest invasive predators (namely, black rats and feral cats) significantly affect Manumea, as also suggested by Beichle (1982a; pers. comm.). However, a negative impact on Manumea may be inferred because the mentioned predators have been shown to affect pigeon species in other oceanic islands (e.g. Hernandez et al. 1999, Collar 2015). Data on a trial to control invasive rats run in a 65 ha site at Malololelei in recent years (Apia catchments KBA) are under analysis but appear to show that bird numbers and diversity benefit from rat management.

In summary, the likely scenario is that following the two major cyclones that hit Samoa in the early 1990s the population of Manumea declined dramatically and was never able to recover due to the combined effects of continued habitat loss/degradation, hunting with shotguns and impacts from feral cats and rats.

5. PAST CONSERVATION EFFORTS

5.1 Technical work

A Manumea Recovery Plan for the period 2006-2016 was developed by national and international experts and approved by MNRE in 2006 (MNRE 2006). The conservation efforts conducted during this decade were reviewed in 2016-2017 by a panel of national and international stakeholders and experts who concluded that “The key known, or suspected, threats to Manumea survival - such as deforestation/forest degradation, invasive alien species occurrence/spreading and uncontrolled hunting – seem to have been little mitigated during the past decade, within the areas listed in the MRP 2006-2016 as “key areas for conservation of Manumea” (Serra 2017).

The review team noted that the next decade, 2017-2027, will be a crucial one in terms of preventing the national bird of Samoa from going extinct. The working group therefore recommended that the Samoa Government dramatically increase its conservation efforts for Manumea as “there may not be another decade to save this charismatic and unique bird”.

Overall, conservation efforts for the benefit of Manumea have been piece-meal and mostly resourced through small-scale initiatives with the exception of the UK-funded Darwin Initiative Project. This project carried out between 2014 and 2017 (with a budget of about USD300,000) was mainly aimed at researching the ecology and behavior of the species. However, the aim of the project was changed during the course of its implementation into a desk analysis on the hunting practice in Samoa (based on data made available by the Government of Samoa) and an attempt to assess the distribution of Manumea based on the call and use of automatic recorders (still in progress with results pending).

As mentioned, a trial to control invasive predators at a secondary forest site of 65 ha in Malololelei, Upolu (led by MNRE with the support of the Samoa Conservation Society, Auckland Zoo and PelGar International; funded by the New Zealand’s Pacific Development and Conservation Trust) is still in progress with results pending.

The last survey aimed at estimating the abundance of the species was conducted by Beichle between 2005 and 2006 which estimated 500 Manumea survived. As already mentioned this figure is now considered a substantial overestimate as it was based on call data which could be confused with Lupe. From 2006 onwards Manumea surveys [e.g. Butler (2012), Butler and Stirnemann (2013), Uili (2014), Stirnemann (pers. comm.), Serra et al. (2017), O'Brien and Masibalavu (2017), to mention a few] were aimed at just detecting the species in the field with no attempt to estimate abundance. Unfortunately, the outcome of most Manumea searches during the past decade has been inconclusive - as was the very recent search performed in mid October 2019 (Serra 2019).

Surveys based on traditional ecological knowledge carried out in 2016-2017 (Serra et al. 2017) contributed to the identification of rainforests where Manumea still occur (through documentation of most recent sightings by selected reliable hunters and through field visits and direct call identifications by the same hunters), to an independent assessment of the conservation status of Manumea and the threats to its survival, and to the knowledge about the diet and behavior. The survey was also instrumental in confirming once and for all the issue of the call identification and the distinctive flight pattern of Manumea.

5.2 Community level

During recent years rainforest management plans were discussed and agreed with the village councils of Uafato, Aopo and Falealupo under the Strengthening Multi Sectoral Management of Critical Landscapes in Samoa (SMSMCL) project funded by the Global Environment Facility (GEF) under a partnership with the Samoan government. These plans included commitments to protect and restore the ancestral rainforests of these villages, to regulate hunting and to protect pigeons (and bats), and also to control invasive species. The Uafato management plan was endorsed by the Government and the village council in November 2019 and thus it has officially become operational while the other two plans still need to be endorsed (Suemalo Talie Foliga, pers. comm.).

According to MNRE, during the past decade, some villages have independently implemented forest and pigeon protection through village by-laws. In key villages such as Uafato and Faleaseela there seems to be an appreciable level of community support and commitment towards implementing greater local efforts to protect Manumea. Efforts have already been made to enforce local hunting bans and there is a will to implement more activities such as pest control and restoring of native forest. A 12-ha privately owned bird sanctuary was established in 2015 in Malololelei forest and efforts are currently under way to expand it (SCS, pers. comm.).

Other communities managing forest areas where Manumea have been sighted in the past, are currently seeking support from the Government to re-enact their conservation programs aimed at protecting Manumea.

A number of awareness and education programs have been performed for the sake of Manumea conservation starting from the 1990s including a campaign in 1994 with the support of RARE Social Marketing (www.rare.org), the 2006 Regional Natural Heritage Programme Manumea and Maomao Conservation Project, the selection of the Manumea as the mascot for the 2007 South Pacific Games, and the 2013 Conservation Leadership Program (Uili 2014). National environmental events promoted by MNRE such as the Biodiversity Day and the Environment Week have also targeted Manumea with the aim to promote its significance and the need for protection by all Samoans.

In July 2019 a major Manumea Conservation Campaign was launched and initiated by MNRE/SCS with the aim of mitigating and controlling the effects of hunting on Manumea through a nation-wide awareness campaign (SCS and MNRE 2019). The three primary objectives of this 12-month behavior change campaign are to: 1) support local efforts to protect the Manumea in six targeted native rainforest areas customarily controlled by villages including the ban on hunting pigeons within the conservation areas; 2) gain support for an enforced 1-year national moratorium on the commercial trade of pigeon before the start of the October-December hunting season in 2019 (with the possibility of extension should it prove successful); 3) reduce demand for buying, gifting and consuming pigeon.

In this framework three large “Manumea murals” were painted on prominent buildings in Apia and more murals have since been painted in “Manumea friendly villages” with the aim to further spread the awareness and increase national pride in the Manumea.

6. RECOVERY PLAN

6.1 Vision, Goal and Objectives

Vision: Manumea is no longer in danger of extinction with secure self-sustaining populations occurring in its historical range, all protected against threats.

Goal: Manumea is down-listed from “Critically Endangered” to “Endangered” in the IUCN Red List by 2029, meaning that one of the two populations in Upolu and Savaii increases to more than 50 mature individuals. Most Samoans recognize the Manumea as a key element of their natural and cultural heritage and are playing their part in its conservation. The bird is used as a flagship for rainforest conservation in Samoa.

Objectives: the recovery plan objectives and their timing/priority are shown in Table 1. The proposed duration in years for each level of timing/priority is as follow:

- Immediate = within 1 to 2 years.
- Short term = within 3-5 years.
- Medium term = within 6-10 years.

#	Objective	Timing/Priority
1	Establish the governance arrangements for coordinating the implementation of the MRP and an adequate fund raising campaign	IMMEDIATE
2	Promote protection and restoration of Manumea Key Rainforest Areas (MKRAs)	IMMEDIATE – SHORT TERM
3	Eliminate the threat from hunting, with a focus on MKRAs	IMMEDIATE – MEDIUM TERM
4	Manage invasive predators, with a focus on MKRAs	SHORT TERM
5	Increase ecological knowledge about the Manumea, with a focus on the extent to which conservation actions benefit the species’ recovery	IMMEDIATE – MEDIUM TERM
6	Explore and evaluate the option of captive breeding and, if deemed feasible and appropriate, make necessary preparations	SHORT – MEDIUM TERM
7	Promote public awareness and a behaviour change campaign relating to harvesting Columbidae species in Samoa	IMMEDIATE – MEDIUM TERM
8	Build threatened species conservation expertise and skills in Samoa	SHORT – MEDIUM TERM

6.2 Recovery Plan Workplan

The MNRE is the key agency responsible for facilitating the implementation and monitoring of the MRP 2020-2029. Some objectives have been already partly achieved in some MKRAs while some actions may be already ongoing at other sites (MNRE, pers. comm.). The activities proposed in the present plan may be revised and adjusted upon consulting specific communities. The estimated total budget to fully implement this plan amounts to approximately USD\$1.8 million. Implementation of the workplan should be reviewed and evaluated at its mid-term, in 2024-2025, and a revised implementation workplan developed. This process is essential because new information gathered as the MRP is implemented will better inform the plan about where to invest and what. Moreover, if the conservation status of Manumea further declines or is discovered to be worse than previously thought, the cost of recovery may increase.

OBJECTIVE 1: Establish the governance arrangements for coordinating the implementation of the MRP and an adequate fund raising campaign.

Activities	Timing/ Priority	Estimated Costs (USD) Over 10 Years	Measureable Outputs	Responsibility/ Commitment	Tasks
1.1 Appointment of a Threatened Species Focal Point within MNRE/DEC	IMMEDIATE	5,000	Threatened Species Focal Point is assigned and operational within MNRE/DEC	MNRE/DEC/ACEO + Parks and Reserves/ Principal Officer + Terrestrial Division/ Principal Officer	1.1.1 Finalize TOR and job description (proposed draft TOR and job description in Annex 4) 1.1.2 Formulate proposal to MNRE/DEC CEO 1.1.3 Selection and recruitment or re-assignment 1.2.1 Review arrangements of previous Bird Threatened Group
1.2 Establish an operational Manumea Conservation Working Group (MCWG) coordinated and led by MNRE/DEC with key assistance from partners	IMMEDIATE	0	MCWG is established and operational	MNRE/DEC/ACEO + Parks and Reserves/ Principal Officer + Terrestrial Division/ Principal Officer; Birdlife Oceania/Regional Programme Coordinator; SCS/President; Auckland Zoo/Pest Control Co-ordinator	1.2.1 Review arrangements of previous Bird Threatened Group 1.2.2 Discuss and agree on aim, roles and responsibilities (proposed TOR in Annex 5) 1.2.3 Define modus operandi (proposed TOR in Annex 5) 1.3.1 Prepare a list of potential funding opportunities (including eligibility, fund sizes and deadlines) suitable for the implementation of all or some key objectives of MRP 1.3.2 An approval system for project proposals is agreed and set up within MCWG
1.3 Launch and implement a 2-year fund raising campaign	IMMEDIATE	20,000	Suitable funds are raised to recruit a Manumea Conservation Coordinator and to start implementing key activities of MRP	MCWG; MNRE/DEC/ Parks and Reserves/ Principal Officer + Terrestrial Division/ Principal Officer; Birdlife Oceania/Regional Programme Coordinator; SCS/President; Auckland Zoo/Pest Control Co-ordinator	1.3.3 Assign tasks of preparing specific applications to willing members of the MCWG based on experience (basic time compensation provided for freelancers) 1.3.4 Proposals are circulated among MCWG members, discussed and agreed via email and conference calls 1.3.5 A sensible number of suitable applications, reflecting the priorities of MRP, are submitted each year
1.4 Recruit a Manumea Conservation Coordinator as soon as sufficient budget is raised with a role to coordinate and manage conservation activities on the ground	IMMEDIATE	50,000/year	Manumea Conservation Coordinator is recruited and operational, effectively coordinating key MRP activities on the ground		1.4.1 Finalize TOR and job description (proposed draft TOR and job description in Annex 6) 1.4.2 Advertise and circulate job announcement 1.4.3 Selection process is performed 1.4.4 Recruitment and contracting

OBJECTIVE 2: Promote protection and restoration of Manumea Key Rainforest Areas (MKRAs).

Activities	Timing/ Priority	Estimated Costs (USD) Over 10 Years	Measureable Outputs	Responsibility/ Commitment	Tasks
2.1 Develop detailed site and community profiles and engagement plans for each MKRA; define its preliminary proposed boundary based on updated forest quality maps	IMMEDIATE	10,000	Site and community plans, and engagement plans + proposed boundary finalized and shared within MCWG	MCWG; MNRE/DEC/ Parks and Reserves/ Principal Officer + Terrestrial Division/ Principal Officer; SCS/ President; Birdlife Oceania/Regional Programme Coordinator	2.1.1 Conduct rapid surveys (birds, forest, socio-economics) at MKRA that have not yet been surveyed 2.1.2 Recover and study updated forest cover satellite maps for each MKRA, with a focus on <i>Dysoxylum</i> spp. occurrence and distribution 2.1.3 Prepare community and site profiles, proposed protection/ zonation boundary and a community engagement plan 2.2.1 Run 3 consultations at each MKRA using as template the preparation of management plans for Uafato -Tiavea and for Falealupo under the SMSMCL UNDP/GEF project with the aim to assess and stimulate support and promote engagement
2.2 Assess support for conservation by target communities and discuss conservation options with them	SHORT-TERM	5,000	Support assessed, discussions held, recorded and shared within MCWG		2.3.1 Discuss, prepare and agree 5-year management/ conservation plans for each MKRA, focus on how to mitigate the key threats to Manumea (forest preservation/restoration, hunting, invasive predators) and how to obtain tangible benefits to the community 2.3.2 Management/conservation plans are endorsed by the village council of each MKRA and by MNRE 2.4.1 A member of the village is selected and appointed as Manumea/Forest Guardian for a fixed term (a different member of the village is appointed for each term in order to spread benefits within the community) - unless otherwise agreed with the village council 2.4.2 Implementation of activities and tasks agreed for the duration of 5 years based on the leadership and guidance of the Manumea/Forest Guardian
2.3 Engage the key selected communities; discuss and agree with the village councils specific, effective and realistic conservation and management measures and expected benefits to the communities	SHORT-TERM	50,000	Communities engaged, conservation measures and benefits agreed; all information recorded and shared within MCWG		2.4.3 Plan is revised and updated after 5 years, following independent implementation evaluation 2.4.4 Another 5-year implementation cycle is discussed, agreed and performed

OBJECTIVE 3: Eliminate the threat from hunting, with a focus on MKRAs.

Activities	Timing/ Priority	Estimated Costs (USD) Over 10 Years	Measureable Outputs	Responsibility/ Commitment	Tasks
3.1 Support and monitor locally enforced bans on hunting; work with communities in MKRAs to discuss and put new local measures in place	IMMEDIATE	1,000/site/year	Locally enforced bans on hunting supported and monitored; records of this activity is shared within MCWG	MCWG; MNRE/DEC/ Parks and Reserves/ Principal Officer + Terrestrial Division/ Principal Officer; SCS/ President; Birdlife Oceania/Regional Programme Coordinator	3.1.1 Same as 2.4.1: A member of the village is selected and appointed as Manumea/Forest Guardian for a fixed term (a different member of the village is appointed for each term in order to spread benefits within the community) - unless otherwise agreed with the village council 3.1.2 Discuss and agree with village councils ways to support and monitor locally enforced bans on hunting in line with the concept of the “Manumea Friendly Village” (sensu Manumea Conservation Campaign) 3.1.3 Support and monitor locally enforced bans on hunting under the guidance of Manumea/Forest Guardian; implement any other activity listed in the agreed management plans, as defined in task 2.3.1, and related to control and mitigation of hunting 3.2.1 Two meetings with hunters from each MKRA aimed at discussing and identifying ways to avoid by-catches 3.2.2 Implement trials to minimize by-catches led by the Manumea/Forest Guardian 3.2.3 Based on the above, develop guidelines to help prevent by-catches 3.3.1 MNRE to liaise with Police in order to keep the national register of fire-arms and license holders updated 3.4.1 MNRE to liaise with Government and other ministries to check effectiveness of laws and regulations on enforcing the 2004 hunting ban
3.2 Direct engagement with hunters to eliminate by-catch of Manumea within MKRAs	SHORT-TERM	1,000/site/2nd year	Ways to eliminate by-catches are identified and agreed		
3.3 Update national register of fire-arms and license holders	MEDIUM-TERM	2,000	National register of fire-arms and license holders is updated by Samoan Government		

OBJECTIVE 4: Manage invasive predators, with a focus on MKRAs.

Activities	Timing/ Priority	Estimated Costs (USD) Over 10 Years	Measureable Outputs	Responsibility/ Commitment	Tasks
4.1 Discuss and agree with villages associated with MKRAs trials for managing rats and feral cats, if felt needed	SHORT-TERM	0	Trials are agreed, procedures recorded and shared within MCWG	MCWG; MNRE/DEC/Parks and Reserves/Principal Officer + Terrestrial Division/Principal Officer; Birdlife Oceania/Regional Programme Coordinator; Auckland Zoo/Pest Control Co-ordinator; SCS/President	4.1.1 Discuss and evaluate results of recent rat control from Malololei and Falease'eia especially in terms of impact on biodiversity and birds and determine key lessons learned 4.1.2 Discuss, agree and implement a cat control trial at one of the two sites mentioned in 4.1.1; data collection and results analysis; discuss results and derive lessons learned 4.1.3 One consultation is held at each MKRA to discuss and agree with village councils realistic and effective trials to manage rats and cats if required 4.1.4 Draft trial designs are endorsed by village councils and MNRE/DEC; trials are implemented
4.2 Establish rat and cat management programmes	SHORT-TERM	10,000/site/2nd year	Rat and cat management programmes are implemented, monitored and evaluated		4.2.1 One person from the village is appointed to assist with implementation of the programmes 4.2.2 Programmes are implemented according to agreed plans 4.2.3 Monitoring and evaluation of implementation; data analysis and lessons learned assessed

OBJECTIVE 5: Increase ecological knowledge about the Manumea, with a focus on the extent to which conservation actions benefit the species.

Activities	Timing/ Priority	Estimated Costs (USD) Over 10 Years	Measureable Outputs	Responsibility/ Commitment	Tasks
5.1 Develop and trial a reliable method/s to identify Manumea in the field	IMMEDIATE	20,000/ per year (3 years)	Reliable method to identify Manumea in the field is developed and trailed	MCWG members who have been already engaged in this area, interested and qualified experts and academic institutions specialized in bird sound analysis; MNRE/DEC/Parks and Reserves/Principal Officer + Terrestrial Division/Principal Officer; Birdlife Oceania/Regional Programme Coordinator, SCS/President	5.1.1 Research ideas aimed at testing reliable ways to identify Manumea in the field are discussed and formulated; MCWG is consulted and evaluates and endorses the most promising ideas
5.2 Once reliable field identification method is developed and defined, surveys are conducted to establish baseline population distribution covering the whole country	SHORT- TERM	40,000	Surveys are conducted, reported and shared		5.1.2 Interested and qualified experts apply for grants based on agreed research 5.1.3 Implementation of research in the field with full support from MCWG 5.1.4 Results are reported back to MCWG, shared, analyzed and published if possible 5.2.1 Survey plan is discussed and agreed at MCWG level
5.3 A standard medium/long-term monitoring plan is developed and implemented based on baseline data and aimed at assessing population trend over time	MEDIUM- TERM	15,000/year per 4 year	Monitoring plan is implemented, trends assessed, report produced and shared	MCWG and MCWG members who have been already engaged in this area; interested and qualified experts, MNRE/DEC/Parks and Reserves/Principal Officer + Terrestrial Division/Principal Officer; Birdlife Oceania/Regional Programme Coordinator; SCS/President; Auckland Zoo/Pest Control Coordinator	5.2.2 Survey plan is implemented with full support from MCWG 5.3.1 Monitoring plan is discussed and agreed at MCWG level 5.3.2 Monitoring plan is implemented with full support from MCWG 5.4.1 Research ideas are discussed and agreed at MCWG level
5.4 Undertake research to measure the benefits of conservation actions	MEDIUM- TERM	25,000/year for years 6 to 10	Research undertaken, results shared and published if possible		5.4.2 Research is implemented in the field with full support from MCWG 5.4.3 Report and publications are prepared, results are shared
5.5 Conduct research into the breeding and feeding ecology of Manumea	MEDIUM- TERM	2 PhDs or postdocs (80,000USD each)	Research undertaken, results shared and published if possible		5.5.1 Forest area/s with a sizable population of Manumea is/are identified and local community support is ensured 5.5.2 Research ideas on the breeding and ecology of Manumea are discussed and agreed at MCWG level 5.5.3 Researches are implemented in the field with full support from MCWG and local community 5.5.4 Report and publications are prepared, results are shared

OBJECTIVE 6: Explore and evaluate the option of captive breeding and, if deemed feasible and appropriate, make necessary preparations.

Activities	Timing/ Priority	Estimated Costs (USD) Over 10 Years	Measureable Outputs	Responsibility/ Commitment	Tasks
6.1 Conduct a detailed feasibility study and risk assessment for a Manumea captive breeding programme in Samoa or elsewhere if deemed most beneficial	SHORT- TERM	4,000	Feasibility study and risk assessment performed, report produced and shared within MCWG	MCWG; MNRE/DEC/ Parks and Reserves/ Principal Officer + Terrestrial Division/ Principal Officer; Pacific Bird Conservation; Birdlife Oceania/ Regional Programme Coordinator; SCS/ President	6.1.1 A qualified and experienced conservationist in critically endangered birds/pigeons is identified and hired to conduct the feasibility study and risk assessment
6.2 If a suitable forest area is identified hosting >10 Manumea individuals then implement recommendations of the feasibility study	MEDIUM- TERM	10,000-50,000	Recommendations of feasibility study are implemented, report produced and shared within MCWG		6.1.2 Feasibility study and risk assessment is performed with full support from MCWG 6.1.3 Detailed report is prepared, including recommendations, and shared with MCWG 6.2.1 Depending on the outcome and recommendations of the feasibility study and risk assessment, tasks could range from building an aviary and training staff in Samoa or focusing on a captive breeding facility in Hawaii or New Zealand

OBJECTIVE 7: Promote public awareness and a behavior change campaign.

Activities	Timing/ Priority	Estimated Costs (USD) Over 10 Years	Measureable Outputs	Responsibility/ Commitment	Tasks
7.1 Support the implementation of the on-going Manumea Conservation Campaign (MCC) 2019-2020; link this campaign with on-the-ground conservation	IMMEDIATE	90,000	Implementation of MCC is supported, MCC is implemented successfully with links with on-the ground conservation, reports produced and shared	MNRE/DEC/ACEO + Parks and Reserves/ Principal Officer + Terrestrial Division/ Principal Officer; SCS/ President; Finch Marketing; Birdlife Oceania/Regional Programme Coordinator	7.1.1 Mobilize funding and support needed to fully implement the campaign
7.2 Assess outcomes from MCC and define new revised sets of objectives/activities based on results	SHORT-TERM	10,000	MCC is updated based on results		7.1.2 Support local efforts to enforce village bans on hunting
7.3 Implement new revised set of objectives/activities from MCC, based on activity 7.2, to cover the whole period of implementation of MRP	MEDIUM-TERM	20,000/year	Implementation of revised MCC, reports produced and shared		7.1.3 Gain support for a ban on the commercial trade in pigeon
					7.1.4 Reduce public demand for buying, gifting and consuming pigeon

OBJECTIVE 8: Build threatened species conservation expertise and skills in Samoa.

Activities	Timing/ Priority	Estimated Costs (USD) Over 10 Years	Measureable Outputs	Responsibility/ Commitment	Tasks
8.1 Conduct a training needs assessment of key partners and stakeholders implementing the MRP, with special attention to Manumea surveying and monitoring, invasive predator control and awareness and education	SHORT-TERM	5,000	Training needs assessment is conducted, report produced and shared	MNRE/DEC/ACEO + Parks and Reserves/ Principal Officer + Terrestrial Division/ Principal Officer; Birdlife Oceania/Regional Programme Coordinator; SCS/President; Auckland Zoo/Pest Control Co-ordinator	8.1.1 Specialist is identified and hired to run the assessment 8.1.2 Assessment is performed with full support from MCWG 8.2.1 Specialists are identified and hired to run the training 8.2.2 Training is performed with full support from MCWG
8.2 Implement training programs for relevant stakeholders (Govt., NGOs, NUS, communities)	SHORT/ MEDIUM TERM	10,000/year	Training programs implemented, report produced and shared		8.3.1 Potential trainees are identified and selected according to agreed criteria in relation to each activity of the MRP 8.3.2 Their participation in each activity is formally requested and supported
8.3 In-service training of relevant stakeholders (Govt., NGOs, NUS, communities) while implementing the activities and tasks of the MRP	SHORT/ MEDIUM TERM	2,000/year	In-service training implemented, report produced and shared		8.3.3 In-service training is implemented with full support from MCWG

LITERATURE CITED

Appleton, D. (1871) Appletons' journal: a magazine of general literature. New York: D. Appleton and Company. Volume 5, Issue: 93, Jan 7. The Museum pp27-28. DOI:10.2307/2389232

Armstrong, J.S. (1932) Hand-List to the Birds of Samoa. John Bale, Sons & Danielsson, Ltd., London.

Beichle, U. (1982a) Untersuchungen zur Biologie und Systematik der Zahntaube, *Didunculus strigirostris* (Jardine, 1845). Dissertation zur Erlangung des Doktorgrades der Mathematisch-Naturwissenschaftlichen Fakultät der Christian-Albrechts Universität zu Kiel.

Beichle, U. (1982b) Zum Problem der Haltung von Zahntauben. Gefiederte Welt 106: 305–306.

Beichle, U. (1987a) Lebensraum, Bestand und Nahrungsaufnahme der Zahntaube, *Didunculus strigirostris*. Journal für Ornithologie 128: 75–89.

Beichle, U. (1987b) Zur Ernährung der Zahntaube, *Didunculus strigirostris* (Jardine 1845). Trochilus 8: 83–86.

Beichle, U. (1989) Akustische Abgrenzung der Taubenarten der Samoa-Inseln. Journal für Ornithologie 130: 345–351.

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

Beichle, U. (2006) Saving Samoa's critically endangered Maomao and Manumea: report on field surveys on Upolu and Savaii from 5.10 to 25.10.2005 and from 3.5. to 22.5.2006. Unpublished report, Apia, Samoa, Ministry of Natural Resources and Environment.

Beichle, U. and S., Baumann (2016) The birds of Samoa. Self-published.

Bennett, G. (1862). Observations on the Tooth-billed Pigeon (*Didunculus strigirostris* Peale) inhabiting the Samoan or Navigator Group of Islands, Southern Pacific Ocean. Sydney Morning Herald, 19 August: 2.

BirdLife International (2015). Species factsheet: *Didunculus strigirostris*. Downloaded from <http://www.birdlife.org> on 31.09.2015.

Butler, D. (2012) Report on the birds of upland Savaii. Pp. 85–109. In Atherton, J. and B. Jefferies, eds. Rapid Biodiversity Assessment of Upland Savaii, Samoa. Apia, Samoa: SPREP.

Butler, D. and Stirnemann, R. (2013) Leading the recovery of two of Samoa's most threatened bird species. Biodiversity Conservation Lessons Learned Technical Series No. 25. Critical Ecosystems Partnership Fund and Conservation International, Apia, Samoa.

Collar, N.J. (2015) Natural history and conservation biology of the tooth-billed pigeon (*Didunculus strigirostris*): a review. Pacific Conservation Biology 21: 186-199.

Conservation International – Pacific Islands Programme, Ministry of Natural Resources and Environment, Secretariat of the Pacific Regional Environment Programme (2010) Priority Sites for Conservation in Samoa: Key Biodiversity Areas. Apia, Samoa.

Cox P.A., Elmqvist T., Pierson E.D. and W.E. Rainey (1991) Flying Foxes as Strong Interactors in South Pacific Island Ecosystems: A Conservation Hypothesis. Conservation Biology 5 (4): 448-454.

Elmqvist T., Rainey W.E., P.A. Cox. (1994) "Effects of tropical cyclones Ofa and Val on the structure of a Samoan lowland rain forest." Biotropica 26 (4): 384-391.

Freifeld, H., Steadman, D. W. and Sailer, J. K. (2001) Landbirds on offshore islands in Samoa. Journal Field Ornithology 72: 72-85.

Gibbs, D., Barnes, E. and Cox, J. (2001) Pigeons and Doves: a Guide to the Pigeons and Doves of the World. Pica Press, Robertsbridge, East Sussex, U.K.

Government of Samoa (2004) Protection of Wildlife Regulations 2004. Apia, Samoa.

Jetz, W., Thomas, G. H., Joy, J.B., Redding, D.W., Hartmann, K. and Mooers, A.O. (2014) Global distribution and conservation of evolutionary distinctness in birds. Current Biology 24: 913–930.

Hernández, M.A., Martín, A. and Nogales, M. (1999). Breeding success and predation on artificial nests of the endemic pigeons Bolle's Laurel Pigeon *Columba bollii* and White-tailed Laurel Pigeon *C. junoniae* in the laurel forest of Tenerife (Canary Islands). *Ibis* 141: 52-59.

Lovegrove, T., Bell, B. and Hay, R. (1992) The indigenous wildlife of Western Samoa: impacts of Cyclone Val and a recovery management strategy. New Zealand Department of Conservation, Wellington.

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

O'Brien, M. and V. Masibalavu. (2017) Avifaunal Survey of Priority Sites in Samoa, 2016. Report to SMSMCL GEF/UNDP project. 64 pp.

Pratt, H.D. and Mittermeier, J.C. (2016) Notes on the natural history, taxonomy, and conservation of the endemic avifauna of the Samoan archipelago. *The Wilson Journal of Ornithology* 128(2): 217–241.

RARE (1995) Final Report to Western Samoa's Conservation Education Campaign. RARE Center for Tropical Conservation, Pennsylvania, US. 184pp. SCS and MNRE 2019, Save the Manumea – A national campaign strategy. SCS and MNRE.

SCS and MNRE (2019) Save the Manumea. A National Campaign Strategy. Samoa Conservation Society and Ministry of Natural Resources and Environment, Apia, Samoa.

Serra, G. (2016) Traditional ecological knowledge on Manumea at four key biodiversity areas in Samoa. Extract from report to SMSMCL GEF/UNDP project "Biodiversity surveying of four KBAs in Samoa through traditional ecological knowledge November 2015-June 2016". 42 pp.

Serra, G. (2017) Review of implementation of Manumea Recovery Plan 2006-2016. Unpublished report, Apia, Samoa, Ministry of Natural Resources and Environment.

Serra, G. (2019). Manumea Rapid Survey October 2019. Unpublished report to Samoa Conservation Society.

Serra, G., Sherley, G., Failagi, S.A., Foliga, S.T., Uili, M. Enoka F. and Suaesi, T. (2017). Traditional ecological knowledge of critically endangered Tooth-billed Pigeon (*Didunculus strigirostris*) endemic of Samoa. *Bird Conservation International* 28(4): 620-242.

Shapiro, B., Sibthorpe, D., Rambaut, A., Austin, J., Wragg, G. M., Bininda-Emonds, O. R. P., Lee, P. L. M. and Cooper, A. (2002). Flight of the dodo. *Science* 295: 1683.

Stair, J.B. (1897) A Romance of Samoan Natural History; or records relating to the Manu Mea or Red Bird of Samoa, now nearly, if not quite, extinct. *Transactions and Proceedings of the New Zealand Institute* 30: 293-303.

Steadman DW. (2006) An extinct species of tooth-billed pigeon (*Didunculus*) from the Kingdom of Tonga, and the concept of endemism in insular landbirds. *Journal of Zoology* 268: 233–241.

Stirnemann, R.L., Stirnemann, I., Abbot, D., Biggs, D. and R. Heinsohn (2017) Interactive impacts of by-catch take and elite consumption of illegal wildlife. *Biodiversity and Conservation*. DOI: 10.1007/s10531-017-1473-y

Uili, M. (2014) Samoa's Little Dodo – Saving the Tooth-billed Pigeon. Project ID 06141613. Unpublished report, Apia, Samoa: Conservation Leadership Program.

Watling, D. (2001) A Guide to the Birds of Fiji and Western Polynesia. Environmental Consultants, Suva, Fiji.

ANNEX 1

DEFINITE OBSERVATIONS OF MANUMEA BETWEEN 2009-2019.

Manumea Key Rainforest Areas	Estimated area of MKRA and Forest Habitat	Reference search effort month-year	Definite detections 2009-2019	Conservation effort	Conservation achievements	Notes and references
Uafato-Tiavea KBA	KBA=2482ha, 1171ha of which is open and secondary native rainforest (ca. 47%); 955.53ha of open undisturbed rainforest (38.5%); and 215.83ha of secondary disturbed rainforest (8.7%)	D. Butler 1 day 2009	0 detections	South Pacific Biodiversity Conservation Project in the late 1990s-early 2000s (GEF/SPREP)	Five-year management plan (2017-2022) endorsed by local community and Govt.	The vegetation of this area is among the best remaining undisturbed lowland forest in Samoa, thanks to the ruggedness of the terrain, to its isolation and to past and present stewardship by the local community (Park et al. 1992) MNRE (2017). Uafato Management Plan 2017-2022 O'Brien & Masibalavu (2016) Serra (2016) Serra et. al (2017) Serra (2019)
		G. Serra 4 days 2016	0 detections		Good level of community support	
		G. Serra 2 automatic recorders at two sites for 2 weeks each Mar-Apr 2016	2 calls identified by U. Beichle and S. Baumann		Possibly ban on hunting	
		M.O'Brien & V. Masibalavu 2 days Jul-Aug 2016	2 sightings (2 adjacent days, at bird hide)	SMSMCL UNDP/GEF project (2015-2019)	International exposure on media linked to Manumea recent sightings	
		G. Serra, G. Shirley, S. Young 5 hours Aug 2016	1 sighting (one week later from previous sighting, at bird hide)	SCS bird hide and trail renovation	Renovated bird hide and trail, new panel on trail	
		Chris Lester 5 hours Aug 2017 (assessed G. Serra)	1 sighting			
		G. Serra 4 days Aug 2017	0 detections			
		G. Serra 2 days Aug 2018	0 detections			
		G. Serra and M. O'Brien 5 hours Oct 2019	0 detections			
			0 detections			

Apia catchments KBA (Magiagi, Malolelei, Lanotoo) KBA: 8,336ha	KBA: 8,336ha	MNRE 12 hrs May 2013	0 detections	Lanotoo Lake is a National Park (1161ha) established in 2004 Malolelei Recreative Reserve (12ha) on land owned by Bluebird Lumber & Hardware, inaugurated in June 2015 Proposed Malolelei Rainforest Reserve (500ha including most of the headwaters of the Gasegase catchment), proposed by SCS		Serra (2016) Serra et. al 2017) Uili (2013)
		Louison Charlotte Anais random 2015 (assessed by G. Serra)	1 sighting			
		F. Enoka ? 2015	1 sighting			
		Tommy Moore random 2015 (assessed by G. Serra)	1 sighting			
		Chanelle Philipp Tormey random Sep 2015 (assessed by G. Serra)	1 sighting (pair)			
		G. Serra /150hrs per 57 occasions 2015-2016 Feb 2016	1 sighting			
		G. Serra 1 automatic recording for 2 weeks Mar 2016	1 call identified by U. Beichle			
Falease'ela/ Matafa'a forest	2,600ha	D. Butler 1 day 2009	0 detections			Uili (2013)
		MNRE 10 hrs Aug 2013	0 detections			
O Le Pupu Pue National Park (Upolu) KBA	4,228ha (all KBA)	D. Butler 5 days 2009	0 detections	National Park established in 1978		Uili (2013)
		MNRE 2 hrs Jun 2013	0 detections			
Eastern Upolu craters KBA and Aleipata islands KBA	4,759ha (all KBA)+156ha	MNRE 10 hrs Oct 2013 (Nuutele)	0 detections			Serra and Tipamaa (2016) Uili (2013)
		G. Serra 6 days Sep-Dec 2015 (Nuutele and Nuulua)	0 detections			

Central Savaii KBA (Taga and Aopo)	KBA=72,699ha	BIORAPI 2 weeks May 2012 (Aopo forest)	0 detections	Swedish Conservation Soc. made agreement with Aopo village in the 1980s aimed at conserving the Aopo forest	Unclear results from the 1980s project Aopo upper forest is very steep and this seems the main reason it escaped logging	Butler (2012) O'Brien & Masibalavu (2016) Serra (2016) Serra et. al (2017) Serra (2019)
		MNRE 10 hrs Jun 2013 (Aopo forest)	0 detections			
		G. Serra 6 days May-Jun 2016 (Aopo and Taga forests)	0 sightings/ few call identifications by reliable hunters on the spot at both sites			
		G. Serra 2 automatic recorders for 2 weeks at Aopo forest and 2 weeks at Taga forest May-Jun 2016	few call identifications by reliable hunters at both sites (through recorded calls)			
		M. O'Brien & V. Masibalavu 6 days July 2016 (Aopo forest)	0 detections			
		G. Serra 1 day Oct 2019 (Aopo forest)	0 detections			



Falealupo KBA	FP KBA=1,537 ha, composed of open native rainforest (6.7%) and secondary rainforest (78.9%); New Falealupo community conservation area (FCCA), discussed in 2018= 1885 ha	O’Brien & V. Masibalavu 2 days Jul 2016		Paul Cox efforts during late 1980s/early 1990s that reportedly spared the Falealupo forest from logging SMSMCL UNDP/GEF project (2015-2019)	FCCA established in 1989 Canopy Walkaway established in mid 1990s, still nowadays a source of income for the local community Management Plan (2019-2024) close to final endorsement; agreed inclusion of reef in the new FCCCA (turtle protection agreed) Good-excellent level of community support Possibly ban on hunting	The area is very disturbed from recent cyclones (especially those taken place in the early 1990s) and by human activity, but patches of lowland native forest still cover much of the area (MNRE and Conservation International 2017). A Falealupo Community Conservation Area (FCCA) of 1,171 ha of surface was established in 1989 on communal lands using the principles of indigenous control, preventing the forest to be clear logged by international corporations (Cox and Elmqvist 1997). Thanks to foreign donors and the commitment of ethno-botanist Paul Cox a school, a medical clinic and a treetop canopy walkway were built during the course of the 1990s in association with the establishment of the FCCA. O’Brien & Masibalavu (2016) Serra (2016) Serra et. al (2017)
		G. Serra 2 days Jun 2016				
		Afaese Alopopo (reliable hunter ? 2018 (assessed by G. Serra)				
Tafua and Salelologa peninsula rainforest	3500 ha	MNRE 25 hrs Dec 2013				Serra (2019) Ulili (2013)
		G. Serra 8 hours in 2 days Oct 2019				
		0 detections				
		1 sighting				
		0 detections				

ANNEX 2

PROCESS FOR DEVELOPING THE MANUMEA RECOVERY PLAN

In August 2019, the Samoa Conservation Society received a grant from the Auckland Zoo of New Zealand Conservation Fund to develop a new recovery plan for the Manumea. Gianluca Serra, who had conducted a review of the implementation of the 2006-2016 Manumea Recovery Plan (Serra 2017) was assigned to prepare the new MRP.

First G. Serra prepared an outline of the new recovery plan, including objectives and activities, based on the review of the MRP (2006-2016) and also based on the new Manumea Conservation Campaign (SCS and MNRE 2019). This proposed draft MRP outline was circulated via email to key national and international stakeholders on 19 September 2019 with a request to provide comments and feedback by the end of the month.

Meanwhile SCS and MNRE organized 2 national consultations, one to be held in Salelologa (Savaii) on 7 October 2019 and the other in Apia (at the MNRE conference room, Apia, Upolu) on 10 October 2019. Representatives from villages, members of NGOs and local administrators were invited. Around 25-30 people attended each of the 2 consultations.

Just before the consultations, G. Serra integrated in the outline the comments and feedback received via email and consolidated contributions received. During the 2 national consultations, following an introduction on Manumea and its significance, its status and threats, the outline of objectives and activities were presented.

At this point a feedback from the audience was solicited and working groups were set up. The issues treated during these discussions were the following:

- How feasible are the activities (mainly those related to forest conservation and hunting control) proposed? What are the constraints?
- What are the priority activities required at the village level to conserve the Manumea, in your opinion?
- Is it important to control pigeon hunting in your village? If yes, why and how can this be achieved?
- What are the best arrangements for managing pigeon hunting that can be made?
- Who should be responsible at village level for implementation?
- What would be the short-term cost to the village?
- What would be the long-term benefits?
- What is the best way to build pride in Samoa's National Bird?

- Any other feedback and advice.
- A presentation of the results of discussions via working groups followed. The key feedback were recorded and translated from Samoan into English language by MNRE/DEC staff (listed in Annex 3).

In the afternoon of 10 October, the following experts met at the MNRE conference room for a 1.5 day workshop:

- Moe Uili - Principal Officer of Forest and Reserves Division at MNRE/DEC and Manumea expert
- Czarina Stowers - Principal Officer of Terrestrial Ecosystems Division at MNRE/DEC and Manumea expert
- Fialelei Enoka - Officer of Forest and Reserves Division at MNRE/DEC and Manumea expert
- Mark O'Brien - Birdlife Oceania, Regional Programme Coordinator
- James Atherton - President of SCS and Samoa rainforests and conservation expert
- Roberta Mura Faasavalu - Lecturer of Biology at National University of Samoa
- Sian Buley - Auckland Zoo, Pest Control Co-ordinator
- Richard Gibson - Auckland Zoo, Curator Ectotherms and Birds
- Gianluca Serra - Workshop facilitator; rare birds and Samoa conservation expert.

During the afternoon of 10 October the group focused on discussing and finalizing the objectives and activities of the new recovery plan, including the goal and vision. The next day the group intensively worked on a matrix aimed at adding to the objectives and activities additional key information:

- time frame
- costs
- responsibilities and commitments.

In the days following the workshop G. Serra worked on consolidating and refining the matrix and added a column with the Tasks and another one with the Measurable Outputs. On 24 October 2019 G. Serra circulated a draft MRP matrix to all stakeholders for comments and feedback. Meanwhile he worked on developing the text/narrative of the recovery plan and maps in collaboration with James Atherton. Email discussions on several points ensued until a semi-final draft MRP was circulated on 23 November. Several versions of MRP were circulated again in December 2019 and January 2020, while waiting for key inputs by few experts, until a final document was produced.

ANNEX 3

FEEDBACK FROM CONSULTATIONS IN SAVAII AND UPOLU, 7 AND 10 OCTOBER 2019

Summary of key points expressed by the working groups

- (compiled by Moeumu Uili and Czarina Stowers)
- All communities are in support of the conservation program for Manumea.
- All participants agreed that the Government should work collaboratively with the communities to support conservation initiatives [to recover the Manumea].
- Communities request the Government to work with the villages to start the village (community) conservation areas (CCAs) and revive some of the villages' CCAs that are no longer active. Tafua village specifically requested this in support of the recent sighting reported by the village youth taking a tour of Sweden University to the crater and accidentally sighted Manumea on one of the big trees (tree name unknown). Note: the Manumea identification could not be substantiated in the following weeks.
- Sasina and Letui villages reported illegal logging as an ongoing activity in their ancestral forest. An agreement was proposed to strengthen ties within the village council and enforce the ban on logging trees internally.
- All believe that establishing CCAs plays a significant role in the protection of Manumea, and that they would like to develop CCAs in their villages with the support of Government and partners.
- All participants agreed that in order to establish CCAs, the first and important step is for the village Matai Council to meet and set the platform for investing in this program first before moving to the next level.
- Some of the communities agreed to set-up their own environment committees in the village to manage the CCAs and report to the council, others insisted on having the village council as the paramount controller of the CCAs.
- All understood the importance of by-laws and that it is a must to have them.
- There were also discussions about strengthening the Governments' enforcement of the law and about villages collaborating to do their part on enforcement at the village level.
- Communities support tree planting programs to promote forest restoration and improve habitats for birds and wildlife.
- Support by Government and partners is welcomed to assist villages with managing invasive species using as a model the Malololelei pest control program.
- Communities in Savai'i support the ban on shooting inside the CCAs. The majority of communities in Upolu agreed to a ban on shooting birds but allow hunting wild animals including potential pest species.
- Upolu communities agreed that the hunting ban should focus mainly on outsiders but it is very hard for some communities to monitor and patrol their whole forest. The law

should support this ban by targeting those people who illegally enter lands with no permission to hunt.

- Communities proposed more awareness programs on TV for Manumea and maintain broadcasting timeframe for a longer period so people are aware and understand the importance of protecting the Manumea. They also proposed to spread saving the manumea message/ murals, billboards etc...to rural villages and Manumea village.

Some of the issues faced by communities:

- No financial aid to support a conservation program especially in the long term.
- Creating alternative income for communities who rely on particular natural resources i.e. Uafato relying on the ifilele tree.
- Legally forbidding the hunting on CCA lands.
- Very little capacity in communities to operate CCAs and conduct patrol of the protected forest, protecting it from illegal hunting or logging.

ANNEX 4

DRAFT TERMS OF REFERENCE FOR THE POSITION OF “THREATENED SPECIES FOCAL POINT”

Scope of services

The Threatened Species Focal Point will act as a secretary and/or chair of the Manumea Conservation Working Group (MCWG) and as a key liaison between MCWG and MNRE/ Government; and between MCWG and the local communities and the international communities (including donors). The focal point will likely sit within MNRE.

Key duties

- coordination and facilitation of the functions performed by the MCWG
- administrative and cultural supervision for on-the-ground implementation of the MRP
- support and facilitate work of the Manumea Conservation Coordinator (draft TOR in Annex 6) and who ever is working on the ground
- calling meetings (vis-a-vis, conference calls etc.)
- request and solicit responses and endorsements from MNRE/Govt.
- organize and facilitate meetings with local communities and act as cultural facilitator.

Qualifications and experience

- 5-10 year experience in coordination and facilitation roles (Government. and/or NGOs)
- good/excellent communication and inter-personal skills
- fluent in English and Samoan
- academic degree in the environment field is desirable.

Note: This position may originate from the re-assignment of an already existing position within MNRE or from a totally new recruitment process.

ANNEX 5

DRAFT TERMS OF REFERENCE FOR THE STRUCTURE OF THE “MANUMEA CONSERVATION WORKING GROUP”

Aim: to oversee the implementation of MRP (2020-2029), from technical-scientific, administrative and cultural perspectives.

Chair/secretary: Threatened Species Focal Point (see proposed draft TOR in Annex 5)

Members: Whoever, at national and international level, is qualified and/or experienced and/or willing to contribute to the sound implementation of the MRP (2020-2029) with an attitude of open cooperation and active collaboration. Ornithologists, Columbidae experts and ecologists from around the world are eligible to become members of the working group. The people who actively contributed to the preparation of the MRP (2020-2029) are assumed to be the core members:

- Moeumu Uili - Principal Officer of Forest and Reserves Division at MNRE/DEC and Manumea expert
- Seumalo Afele Failagi - ACEO of MNRE/DEC and Manumea enthusiast
- Czarina Stowers - Principal Officer of the Terrestrial Ecosystems Division at MNRE/DEC and Manumea expert
- Laulu Fialelei Enoka - Officer of Forest and Reserves Division at MNRE/DEC and Manumea expert
- Mark O'Brien - Birdlife Oceania, rare birds expert
- James Atherton - President of SCS and Samoa forests and conservation expert
- Roberta Mura Faasavalu - Lecturer of Biology at National University of Samoa
- Sian Buley - Auckland Zoo, expert of invasive predators control
- Richard Gibson - Auckland Zoo, expert of invasive predators control
- Gianluca Serra - rare birds and Samoa conservation expert
- David Butler - Bird expert and ecologist, Samoa conservation expert
- Rebecca Stirnemann - Samoa avian expert and ecologist
- Sabine and Ulf Beichle - Senior Manumea experts and authorities
- Peter Luscomb - Pacific Bird Conservation
- Karen Baird – SPREP Threatened and Migratory Species Adviser.

Duties:

- advise and guide the fundraising process and endorse project proposals certifying that they are in line with MRP (2020-2029)
- guide selection and recruitment of staff or arrange tenders

- monitor, review and report on the progress in implementation of MRP activities and direct future programs and outcomes

Modus operandi:

- either meet face to face or via conference call on a regular basis (eg every 3 months)
- enabling the Govt. approval of on-the-ground activities

ANNEX 6

DRAFT TERMS OF REFERENCE FOR THE POSITION OF “MANUMEA CONSERVATION COORDINATOR”

Scope of services

The Manumea Conservation Coordinator will act as a technical/scientific role leading, coordinating and implementing conservation work on the ground. The Coordinator could be housed under Division of Environment and Conservation of MNRE.

Key duties

- implementation of objectives 2-6 of the MRP on the ground, directly or through external technical assistance
- establish and maintain good working relationships with MCWG members, key local communities, Govt. representatives and stakeholders in general
- advise and report on the status of implementation of the MRP and the MCC

Qualifications and experience

- degree in nature sciences, biology, ecology or related field
- 15 years experience in field bird conservation; 10 years experience on endangered bird species and/or on pigeons, desirable
- 15 years work experience internationally and dealing with Government agencies and local/international NGOs
- at least 5 year conservation work experience in the Pacific island countries, work experience in Samoa desirable
- excellent skills of working in a team and with partners, excellent interpersonal skills
- demonstrated knowledge and familiarity of Polynesian and Samoan culture, able to speak Samoan would be a plus
- demonstrated cultural sensitivity skills in dealing with communities

Recommended citation: MNRE and SCS (2020). Recovery Plan for the Manumea or Tooth-billed Pigeon (*Didunculus strigirostris*) 2020-2029. Ministry of Natural Resources & Environment, Government of Samoa and Samoa Conservation Society. Apia, Samoa. 50 pp.

ISBN 978-982-101-059-7



March 2020