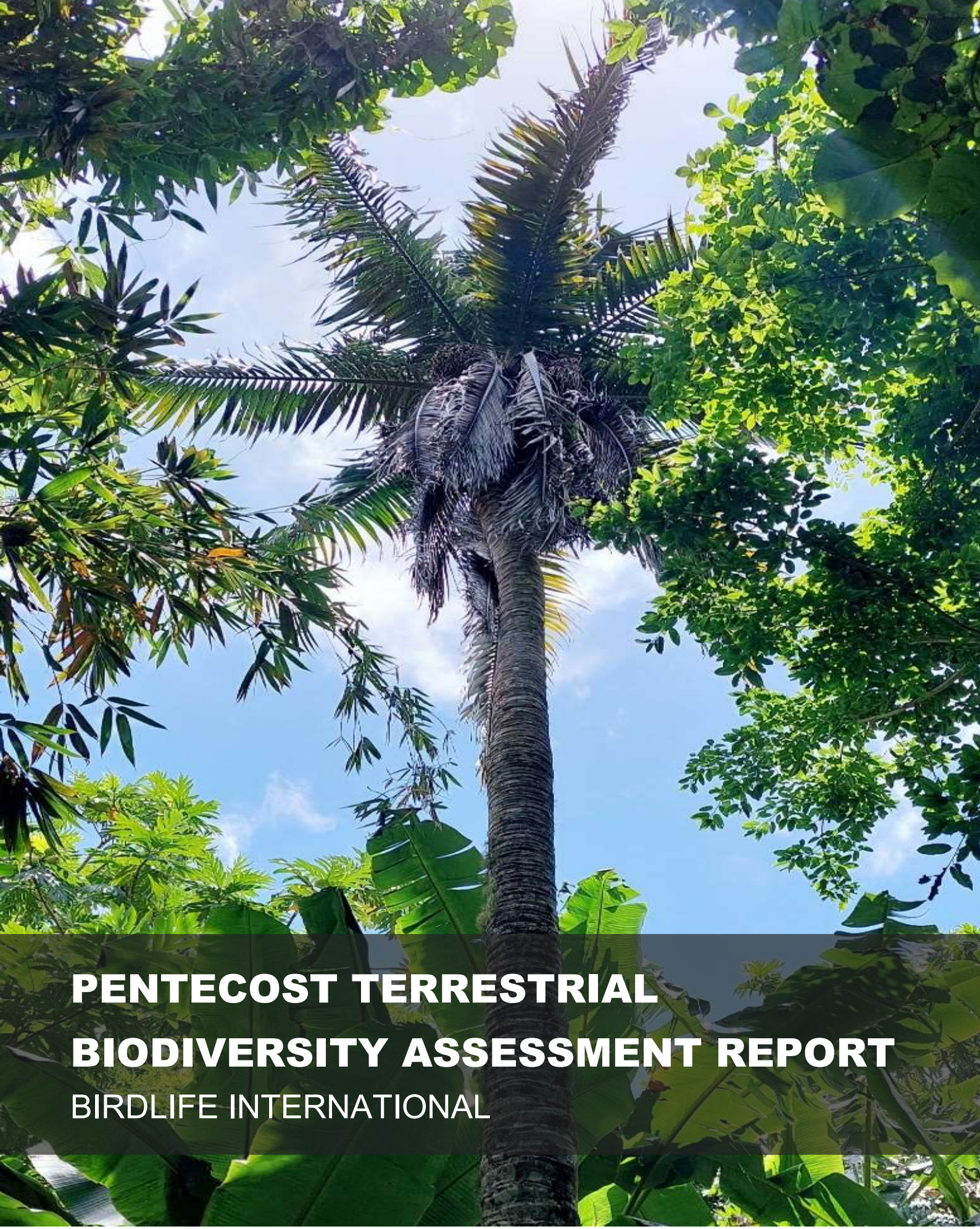

PENTECOST TERRESTRIAL BIODIVERSITY ASSESSMENT REPORT

BIRDLIFE INTERNATIONAL

EUROPEAN UNION

Sweden
Sverige

PEUMP
Pacific-European Union Marine Partnership Programme

SPREP
Secretariat of the Pacific Regional Environment Programme

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SPREP Library Cataloguing-in-Publication Data

Pentecost terrestrial biodiversity assessment report. Apia, Samoa : SPREP, 2025.

90 p. ; 29 cm

ISBN: 978-982-04-1469-3 (ecopy)

1. Biodiversity conservation – Law and legislation – Vanuatu. 2. Ecosystem management – Economic aspects – Vanuatu. I. Morris, Andrew T. II. Doro, Thomas Morris. III. Wotlolan, Dean. IV. Leodoro, Trevor. V. Baereleo, Kingsley. VI. Pacific Regional Environment

Programme (SPREP). VII. Title.

333.9509595

This report should be cited as:

SPREP 2025. Pentecost Terrestrial Biodiversity Assessment Report. Apia, Samoa: Secretariat of the Pacific Regional Environment Programme, Apia, Samoa. 90 pp.

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Disclaimer

This document has been prepared and printed with the financial support of the Pacific-European Union Marine Partnership (PEUMP) Programme, funded by the European Union and the Government of Sweden. Its contents do not necessarily reflect the views of the European Union or the Government of Sweden. This document has been compiled in good faith, exercising all due care and attention. SPREP does not accept responsibility for inaccurate or incomplete information.

Table of Contents

List of Figures

List of Tables

List of Abbreviations

AMNH:	American Museum of Natural History
AOO:	Area of Occupancy (KBA Standards and Appeals Committee, 2019)
asl:	Above sea level (in metres)
AZE:	Alliance for Zero Extinction site (a site where a species is listed as Critically Endangered or Endangered, and where 95% or more of the species occurs within the site boundary)
BIEM:	By-catch and Integrated Ecosystem Management
BIORAP:	Biodiversity Rapid Assessment Programme
DEPC:	Department of Environmental Protection and Conservation, Vanuatu Government.
Endemic:	Restricted, in distribution, to Vanuatu. Is not recorded outside the country
EOO:	Extent of Occurrence (IUCN 2013)
ESH:	Extent of Suitable Habitat (KBA Standards and Appeals Committee, 2019)
FAO:	Food and Agriculture Organisation
GEF/PAS:	Global Environment Facility/Pacific Alliance for Sustainability
GPS:	Global Positioning System – used to determine Latitude/Longitude of Stations
Introduced:	Has been released deliberately, or accidentally, to Vanuatu by man
Indigenous:	Occurs naturally in Vanuatu and also other countries
IUCN:	International Union for the Conservation of Nature
IUCN Red List:	IUCN Red List of Threatened Species
KBA:	Key Biodiversity Area
LC:	Least Concern (IUCN Red List for Species)
mya:	Million Years Ago
ORNITO:	An app for android that illustrates the birds of the world by country
PENAMA:	Province in Vanuatu, located in the northwest of the country, and consisting of three major islands, Pentecost, Ambae and Maewo.
PEUMP:	Pacific-European Union Marine Partnership Programme
PNG:	Papua New Guinea
SPREP:	Secretariat of the Pacific Regional Environment Programme
USP:	University of South Pacific
WSSE:	Whitney South Sea Expedition (June 1926-January 1927 in Vanuatu)

SUMMARY

The North Pentecost Key Biodiversity Area was identified under the Critical Ecosystem Partnership Fund East Melanesian Islands Ecosystem Profile. The trigger species for the KBA comprised Vanuatu White-eye and New Hebrides Honeyeater.

The survey, in 2022, indicated that, while Vanuatu White-eye occurs commonly throughout the KBA, the total area of the legacy site is less than 1% of the total range of the White-eye. Therefore, this species does not qualify as a trigger species under the KBA Standard (2016).

Of more concern is that the New Hebrides Honeyeater was not recorded during this survey – this species also does not qualify as a trigger species for the site.

We were unable to obtain sufficient information on the occurrence of reptiles and amphibians, or freshwater taxa, in the study area –a gap that should be remedied as soon as possible.

The presence of 4 of the 6 stands of Devil Palm, a Critically endangered species restricted to North Pentecost, within the legacy KBA boundary provides sufficient evidence to maintain the KBA. Two other taxonomic groups of plants, the Ferns, Polypodsiopida and the Ericales may also qualify as KBA trigger species at the site, under criterion B2. Further work should be undertaken to confirm these assessments.

The Devil Palm is restricted to land above 150m asl and native forest habitat (Plunkett 2020). If this is the sole trigger species then we can redraft the KBA boundary to exclude the coastal area. We may also consider it appropriate to extend the boundary to include the other two known stands of Devil Palm – thus making the site eligible as an Alliance for Zero Extinction (AZE) site.

The socio-economic, community surveys indicate that there is considerable pressure on the current Devil Palm distribution. There is a need to provide some means of protecting or preserving the remaining Devil Palm sites and, potentially, restoring new sites in order to increase the resilience of the species. The literature indicates that Devil Palm has been reared in captivity in recent years – and so the opportunity to restore the species by planting is an option.

The continued spread of kava, and taro, cultivation in the hills around North Pentecost is likely to impact on the water quality and runoff from the ridge into the surrounding reefs. More information highlighting the potential impacts would help to better evaluate the overall costs, and benefits, of this agricultural expansion.

BACKGROUND

LITERATURE REVIEW

The islands making up the Vanuatu archipelago are relatively young and were formed during four main periods of volcanic activity. The oldest islands of Malekula, Santo and the Torres were formed over 22 million years ago, while Pentecost and Maevo were formed between 5 and 11 million years ago (Bigelow 2001).

Older islands generally support greater biodiversity and endemism as younger islands have had less time for speciation to occur. Larger islands also generally provide a greater range of habitats and thus potentially support greater biodiversity and endemism. Other factors affecting biodiversity include latitude, climate and altitude, geographical barriers (e.g. mountain ranges, large distances between islands), occurrence of natural disturbances (e.g. cyclones, prolonged droughts, tectonic uplift) as well as human-induced disturbances (local extirpations and extinctions, use of fire, and introduction of pests like rats, birds and invasive species) (Hickey 2007). All other things being equal we might expect greater biodiversity on the older islands compared with Pentecost.

Vanuatu and the Temotu Province of the Solomon Islands together form a natural biogeographical unit which is isolated by both distance and deep oceanic troughs from the larger neighbouring islands (which are today part of the main Solomon Islands and New Caledonia). These links are most apparent with the bird populations, and indeed comprise a unique Endemic Bird Area (Stattersfield *et al* 1998, BirdLife International 2021).

Vanuatu's flora has strongest links with Solomon Islands, with fewer elements from Fiji and even fewer from Australia or New Caledonia (Wheatley 1992). The characteristic vegetation is lowland and montane rain forest. Cloud forest is present on Espiritu Santo and the southern islands. The entire terrestrial area of Vanuatu is incorporated into a single Ecoregion – 'Vanuatu Rainforests' (Dinerstein *et al* 2017). Scattered mangrove forests occur on some islands (Dahl 1980, Davis *et al* 1986).

Cyclones, earthquakes and associated flooding affect this region. On average, any given area of Vanuatu is struck full-force by a cyclone once in c.30 years, and at such times damage to the forested areas is enormous (Bregulla 1992).

While the oldest Vanuatu rocks are dated to 14 mya, the entire archipelago has been through periods of emergence and submergence, with the last period of emergence only in the last 2 mya. This geologically recent emergence explains some of the discontinuities in reptile and amphibian fauna previously identified in Vanuatu - such as the absence of native frogs (*Platymantis*) and elapid (*Ogmodon*) snakes (Schmidt and Burt 1930, Zweifel and Tyler 1982). In addition, the absence of both *Ogmodon* and *Platymantis* —as well as the presence of *Perochirus* lizards in Vanuatu—has

been suggested as a result of a north to south counter-clockwise rotational geological movement of the entire archipelago (Gibbons 1985).

The prehistoric position of Vanuatu was to the north of the current location (Chase 1971); a location that would explain how groups such as *Ogmodon* and *Platymantis* could have colonized Fiji from the Solomon Islands yet not be present in Vanuatu. Additional support for this more northern location of the Vanuatu islands is provided by the distribution of *Perochirus,* which currently is restricted to Micronesia, with just a single species *(P. guentheri*) occurring in Vanuatu (Bauer 1988, Gibbons 1985). The absence of groups of vertebrates such as frogs and elapid snakes led to the suggestion that the fauna of Vanuatu may be depauperate (Baker 1928, 1929, Darlington 1948, Bauer 1988). Recent examination of the terrestrial reptile diversity in Vanuatu in light of island area, isolation, and emergence history indicated that, in general, Vanuatu meets the expectations of diversity generated by predictions of island biogeography theory (Hamilton *et al* 2009, 2010).

Recent studies on Pentecost, based in the south of the island, following up on agricultural resilience post Cyclone Harold, and/or GEF/PAS studies around Homo Bay have been led by FAO (Scherl and Hahn 2018).

Major Habitats of Vanuatu that occur on Pentecost, as Defined by Plant Communities (Mueller-Dombois and Fosberg 1998, taken from Aalbersberg et al 2012) include:

- Coastal strand vegetation: Frontal herb zone of *Ipomoea* and other creepers, shrub zone with *Scaevola*, and littoral forest with *Casuarina*, *Barringtonia*, *Tournefortia*, etc
- Mangrove forests: Less diverse than mangrove forests in Solomons or PNG.
- Lowland forest on well-drained soils: Three types of forest communities in Vanuatu recognized by stature, likely due to successional recovery from cyclone disturbance.
- Seasonally dry forest and grassland: Rain shadows on NW sides of islands or mountain ranges. These include open “gaiac” forest dominated by *Acacia* and sometimes with *Santalum*, or, where burning predominates, a seral grassland/shrub community dominated by introduced species.
- Lowland forest on limestone: While many islands have limestone terraces and interiors, often the soil is developed on a layer of volcanic ash and therefore is not specifically limestone forest.
- Montane rainforest and scrub: Similar to Solomon Islands with low altitude montane forest on exposed peaks or islands, and composed of *Metrosideros*, *Syzygium*, *Weinmannia*, etc.
- Anthropogenic garden, grassland and secondary forest: Tree gardens and bush-fallow are typical of subsistence agriculture, and widespread throughout Vanuatu.

The known terrestrial vertebrate fauna of the New Hebrides consists of 10 species of mammals (excluding feral domestic stock), 61 species of resident land- and freshwater birds, 20+ species of reptiles and one amphibian. Of these, three, five, four and one species respectively have apparently been introduced by humans.

Most of the native vertebrates, including all endemic species, occur in mature serai or climax forest; relatively few species, all of which are cosmopolitan or wide-ranging in the Indo-Pacific region, are restricted to open habitats.

There have been several ornithological inventories of Vanuatu (extracted from Andersen *et al* 2017).

- Tristram reported on collections from Vanuatu (New Hebrides) in the 1870s (Tristram 1876, 1879)
- The American Museum of Natural History (AMNH) has small collections from the 1870s and 1899–1901 by an unknown collector from the Rothschild collection (P. Sweet, *pers. comm*.).
- Additional small collections exist at AMNH from the Senckenburg Museum dating to the 1960s (P. Sweet, *pers. comm*.) and the Museum of Vertebrate Zoology at UC Berkeley collected in 1943–1944 by T. E. Reynolds and C. G. Sibley.
- The largest collection of Vanuatu birds—also curated at AMNH—is from the Whitney South Sea Expedition (WSSE; Murphy 1922; Chapman 1935; Bryan Jr. 1969). The WSSE conducted major ornithological expeditions in the archipelago, led by Rollo Beck from June 1926–January 1927 (Beck 1969). Beck was accompanied first by José G. Correia until 9 December 1926 and later by Frederick P. Drowne on 13 January 1927, just days before they left Vanuatu for the Solomon Islands (Correia 1969; Drowne 1969).

Much of what we know about the status and distribution of Vanuatu's avifauna can be traced to these collections. Ernst Mayr published extensively on the systematics and distribution of Melanesian birds, with numerous contributions focusing on the birds of Vanuatu (e.g., Mayr 1931, 1932a, 1932b, 1933, 1938, 1941). He synthesized this work with respect to the origin and biogeography of the Polynesian avifauna (Mayr 1940a, 1940b) and in a book that became the first field guide to the birds of the southwest Pacific (Mayr 1945).

The Royal Society/Percy Sladen Expedition surveyed eleven sites on 6 islands in Vanuatu (Santo, Malekula, Éfaté, Erromango, Tanna, and Aneityum) with a focus on all terrestrial vertebrates (Medway and Marshall 1975). They surveyed birds with mist nets. Their "observations confirmed the general picture of Mayr's (1945) summary, and neither added to the species nor extended the known dates of their [WSSE] sojourn in the New Hebrides" (Medway and Marshall 1975:430).

Bregulla (1992) later wrote a comprehensive book on the status and distribution of the birds of Vanuatu, and recently, a modern field guide to the birds of Melanesia—including Vanuatu—was written by Dutson (2011). Tarburton (web-based report) lists 45 species of bird as present on the island – based on 28 separate references. These provide the most up-to-date literature on current bird distributions across the island. While recent interest in Citizen Science, such as through eBird and iNaturalist, have provided a way of capturing the most recent changes the only records on eBird for North Pentecost have been generated by Andrew Morris, as part of this project, while three records, all of reptiles, are included on iNaturalist for North Pentecost.

The East Melanesian Islands Hotspot has depauperate freshwater fish communities (compared with mainland PNG) but there is high diversity and endemism in freshwater invertebrates (Polhemus et al. 2008).

- All freshwater fishes in the hotspot are amphidromous (i.e. with a marine larval stage). Diversity is dominated by gobies and some endemism is known in the subfamily *Sicydiinae*. However, these are very small fish, which are not currently utilized by local communities or represented in indigenous taxonomies.
- The larger but non-endemic species like eels (*Anguilla* spp.), spot-tail bass (*Lutjanus fuscescens*), mullets (*Mugilidae*) and grunters (*Terapontidae*) are utilized for food, as are *neritid* snails and prawns, and reduction in their populations is of direct concern to villagers.
- Surveys in Vanuatu indicate there may be some endemism in freshwater crustacea (Marquet et al. 2002).
- The intense utilization of freshwater species for protein in some areas is having an impact on freshwater ecosystems but there is little to no research in this area. Also, the life histories of freshwater species provide a clear linkage between freshwater and marine ecosystems.

The number of reptile species listed for Vanuatu is regularly being increased.

- Baker (1947) reported 14 lizard species from Vanuatu and stated that the two most common were *E. cyanura* (sensu lato) and *E. caeruleocauda* (named *E. werneri*).
- In 1975, after having surveyed six islands of the archipelago, Medway and Marshall listed 20 species of terrestrial reptiles. They considered four species to be endemic, four as introduced and one introduced amphibian from Vanuatu.
- By 2006 this had increased to 27 native reptile species from Vanuatu, four recently introduced species, three sea kraits and two sea snakes (*elapids*), excluding sea turtles. Native species include one crocodile, 12 geckos, 13 skinks, and one boid snake; note that the gecko H*emiphyllodactylus typus* is certainly present in Vanuatu.
- A total of 37 amphibian and reptile species (32 native species, one potential species [*H. typus*] and four introduced species) are confirmed for Vanuatu today. This diversity does not support the idea of a depauperate herpetofauna when compared with neighbouring archipelagos (Ineich 2011) in contrast with previous comments. Rather it indicates that, for reptiles as for other taxa, Vanuatu has had relatively little effort in terms of biodiversity surveys – a feature also identified for butterfly species on the islands (Tennent, 2009).

Lessons highlighted from the Pentecost FAO study, and relevant to all the study sites in the current project, indicate, for instance, that the community needs to be more aware of what they have, what they are, or could be, protecting, and what is special about what they have. This need for awareness of the forest's importance extends beyond the immediate community to those in the surrounding areas (Scherl and Hahn 2018).

Consultation with communities stressed the holistic benefits of forest conservation (‘’the forest is your pharmacy’’, ‘’a free supermarket’’). This informed a feeling already present in their minds with enough knowledge to convince them of the services, values and functions of the forest to their livelihoods, if it is left standing, not cleared for agriculture or other development (Scherl and Hahn 2018).

OBJECTIVES

- A fundamental part of empowering local decision makers to make informed conservation management and planning decisions for inclusion in their integrated ecosystem management plans is to understand the current status of biodiversity and the ecosystems that communities rely upon and realistic options to manage threats and protect high value food-security species and biodiversity.
- baseline data identifying the biodiversity within marine and terrestrial ecosystems are required for each site in order to develop robust integrated ecosystem management plans.
- This data will be obtained through the implementation of Rapid Biological Assessments (BIORAPs), which are biological inventory programmes designed to rapidly identify and assess the biodiversity within marine and terrestrial habitats, including high value food-security species, for each site.
- An integral part of the BIORAP process will be to work with community members and other stakeholders to undertake the surveys with the aim of strengthening their understanding about the status and threats to the ecosystems that coastal communities rely upon and empower them to make informed conservation management and planning decisions to ensure the long-term conservation of biodiversity and the essential ecological services it provides.
- Engagement with communities and other stakeholders will facilitate input of local and traditional knowledge to the BIORAP assessment where relevant and permitted.

THE RELATIONSHIP BETWEEN THE STUDY SITES AND KEY BIODIVERSITY AREAS

All but one of the 29 Key Biodiversity Areas identified in Vanuatu were established as part of the East Melanesian Islands Ecosystem Profile (Aalbersberg et al 2011). These KBAs were established prior to the revised global standard – agreed in 2016 (IUCN 2106). The KBAs have not been reviewed based on these revised standards and are consequently considered to be ‘legacy sites. There is a need to update and validate those sites that accord with the 2016 Standard. Species are assessed based on their population size on the site relative to their global population. Where global populations have not been assessed then area measurements, primarily ESH, AOO or species Range, within the site are compared with the global estimate. The Lolong to Laone site on Pentecost overlaps with the North Pentecost KBA.

The legacy species that identify North Pentecost KBA (5,227ha) are Vanuatu Honeyeater and Vanuatu White-eye (both LC). Four other bird species occur in the KBA and have global population estimates. These are Red-headed Parrotfinch (15,000 individuals), Palm Lorikeet (1,750 individuals) and Vanuatu Scrubfowl (6,250 individuals). Surveys would need to determine whether 1% or more of these global populations occur on the site.

Neither of the legacy trigger species for the North Pentecost KBA are likely to qualify under the 2016 standard criteria. The current site is too small to hold 1% or more of the global ESH of these species. Either the KBA boundary should be expanded, other species identified that may qualify as trigger species or the site by invalidated as a KBA. There are no potential bird species, based on a recent assessment, but there are some restricted range plant species that are known to occur in the area. In particular the Devil Palm *Neoveitchia brunnea* is a Critically Endangered palm species restricted to North Pentecost.

CHAPTER I

North Pentecost Birds

1.1 SUMMARY

A bird survey, led by Toara Andrew Morris of EcoLifelihood Development Association, took place in September 2022 on North Pentecost. North Pentecost has been recognised as a Key Biodiversity Area, based on two bird trigger species, New Hebrides Honeyeater and Yellow-fronted White-eye.

The purpose of the survey was to collect information to assist the Chiefs and communities of North Pentecost and to confirm the presence of these trigger species for the Legacy KBA and to determine if the KBA should be modified in any way.

The North Pentecost KBA is located at the northern end of Pentecost Island and occupies just over 50 km^2 of land (5227 ha) that encompasses all land on the northernmost peninsula, from sea level to the top of the ridge (384 m asl). The legacy KBA was identified in 2011, with New Hebrides Honeyeater (*Glycifohia notabilis*) and Yellow-fronted White-eye - *Zosterops flavifrons*, as the two trigger species listed. The more quantitative, and rigorous set of standards for KBAs, established in 2016, means that these 2 species are unlikely to persist as triggers. Further improved data on these, and other bird species, is required to confirm Global KBA status of the site. A further potential trigger species, the Devil Palm *Neoveitchia brunnea*, a Critically Endangered palm restricted to this part of North Pentecost, is likely to be a key trigger species that determines the extent of the KBA boundary.

The bird identification team spent approximately seven days undertaking 38 point counts along 7 transects. Each station was assessed to Landuse type, of which 4 types were recognised, Bushlands, Cultivated Land and Pastures, Sub/Tropical Forests and Sub/Tropical Grasslands and Savannas. Bird survey forms were used to collect information on bird species, location, time and type of identification (recordings were by sight, or by sound) and the number of a species in one location as well as the vegetation type and other observations. Cameras were used to take photos, sounds were recorded and a GPS was used to locate waypoints of identification.

This survey identified 23 bird species; all birds associated with the bush. This represents some 26% of Vanuatu's 87 species, or 50% of Vanuatu landbirds. Five endemic species, Vanuatu Scrubfowl, Tanna Fruit Dove, Buff-bellied Monarch, Vanuatu Streaked Fantail and Yellow-bellied White-eye were confirmed as present in the KBA and were widespread across all habitats surveyed. One of these species, the Vanuatu Scrubfowl, is globally threatened.

Our analysis of potential KBA trigger species concluded that the legacy KBA is too small to hold large enough populations of any of the proposed bird trigger species. Indeed, we did not locate the New Hebrides Honeyeater during this survey.

1.2 BACKGROUND

Pentecost Island is in the PENAMA province of the Vanuatu Archipelago. The PENAMA province comprises 3 main islands, Pentecost, Maewo and Ambae. Pentecost is a long, narrow island that runs north to south for over 60 kilometres. Total area of the island is 490km^2 – of which the northern 10%, some 52km^2, is covered by the North Pentecost legacy Key Biodiversity Area. Pentecost is a lush, mountainous island with a central mountain range that separates the humid, and rainy eastern coast from the more temperate west coast. Pentecost and Maewo form the Eastern Belt Islands and were formed from volcanic activity sometime between 8 and 14 million years ago. This Eastern Belt is more recently formed than the Western Belt group of islands (Espiritu Santo, Malakula and the Torres Islands group) – but older than the rest of Vanuatu.

The 2009 census estimated the total Pentecost population to be almost 17,000 individuals. There are no towns on Pentecost, most people live in small, rural, villages surviving on subsistence agriculture and cash crops. Traditionally copra was the main export from Pentecost, but this has now been overtaken by Kava and Taro. Most kava consumed in the towns and cities of Vanuatu and, indeed, most of the kava that is exported from Vanuatu (including to Fiji) originates on Pentecost.

Carrying out this survey was vital to the local community as they are working towards conserving some parts of their lands for water catchment purposes. Making such information available to the locals enables them to make better decisions towards protecting and conserving their natural resources.

Figure 1: Figure 1: North Pentecost Island showing the Legacy KBA boundary taken from https://www.keybiodiversityareas.org.

1.3 METHODOLOGY

The bird survey team used the ORNITO mobile application to assist with carrying out bird identifications as well as relying on expert local knowledge of the North Pentecost team members. The team members were briefed about the survey procedures prior to and during the actual survey.

The surveyors used standard forms (Annex 1) to record the species of bird they heard or saw directly for 5 minutes and used a recorder (Zoom H5) to record the sounds of birds they were unsure about for later validation. Thirty-eight point counts were taken at intervals between 200 and 500 meters along the tracks. The timing of surveys was during early morning, between 5:30am and 10:00am, and during the late afternoon and early evening between 3pm and 5:30pm. Bird sounds could be recorded up to 200 meters away from each waypoint.

If we assume that this is the case, we can calculate that

1. The area surveyed at each waypoint station is πr^2 – where π=22/7, r=0.2km, therefore area is 0.126km^2.
2. We surveyed 38 waypoint stations in the North Pentecost KBA in total, representing 4.788km^2 of land surveyed, c9% of the total land area of the North Pentecost KBA.

Note that this is likely to be an overestimate – many of the species are unlikely to be heard as much as 200m from the recorder. In these circumstances the area actually surveyed per station will be reduced, and so the proportion of the KBA covered reduced. This will under-estimate the total number of birds considered to be present in the KBA. Until we obtain better, distance-sampling, data however we will need to rely on this kind of calculation to derive some form of population estimate for the site.

Figure 2: Map of North Pentecost bird survey locations.

The Latitude/Longitude and Altitude at each of the waypoints for each of the stations were recorded using a GPS and transferred to paper and Excel worksheet. The waypoints have been mapped (Figure 2) to show the distribution. It can be seen that all but 5 of the waypoints were undertaken within the KBA. Of the 5 waypoints south of the southern boundary 3 were in cultivated land (between 60 and 198m asl) and 2 in tropical forest (312 and 321 m asl).

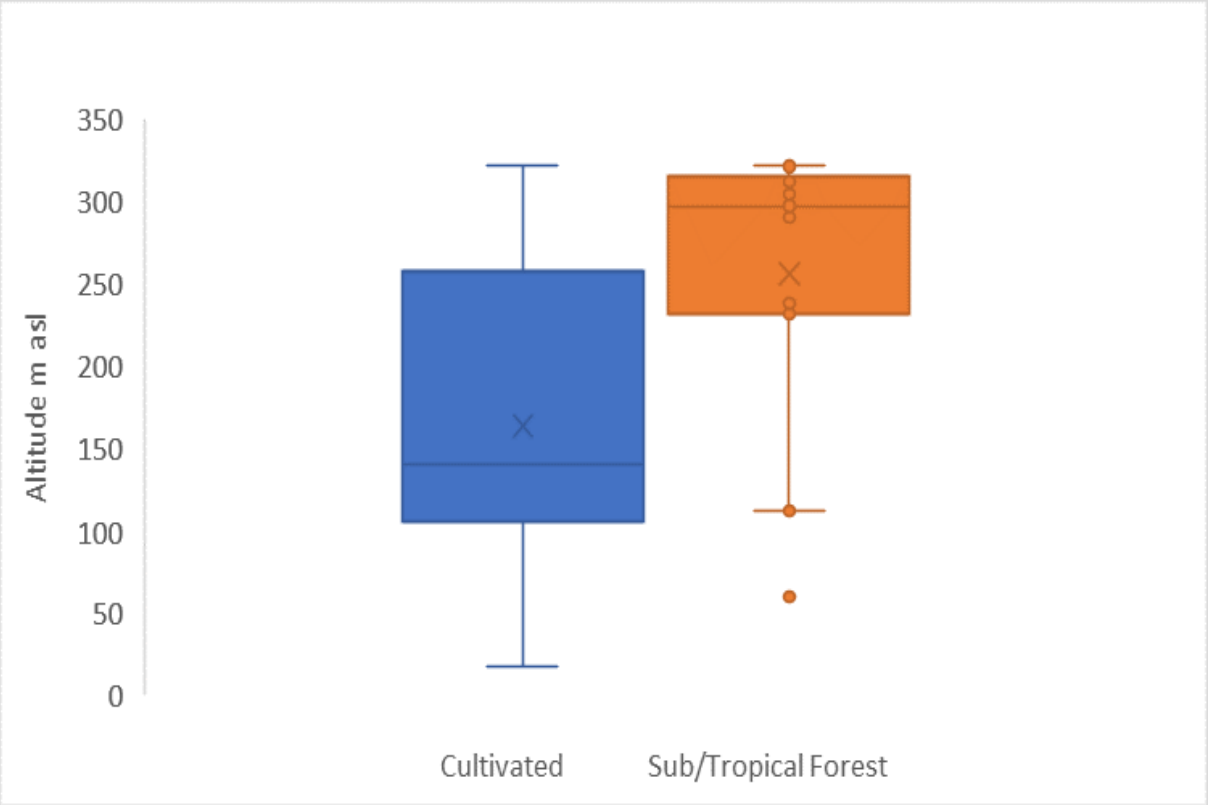
1.4 RESULTS

The survey team recorded 523 birds over 38 point counts and confirmed the presence of 23 land bird species (Table 1). Five of Vanuatu's ten endemic species were recorded, Vanuatu Scrubfowl (*Megapodius layardi*), Yellow-bellied White-eye (*Zosterops flavifrons)*, Tanna Fruit-dove, (*Ptilinopus tannensis),* Buff-bellied Monarch *(Neolalage banksiana) and* Vanuatu Streaked Fantail *(Rhipidura spilodera).* Only one of these species is globally threatened – the Vanuatu Scrubfowl.

Table 1: The number of individuals of each species the number of stations at which each species was recorded, and the estimated number of individuals in North Pentecost KBA (where estimate is No. Indivs*(100/9).

English	Scientific name	No. Individuals	No. Stations	Pop. Estimate for KBA
Brown-capped Emerald Dove	*Chalcophaps longirostris*	15	10	150
Buff-banded Rail	*Hypotaenidia philippensis*	19	13	200
Buff-bellied Monarch	*Neolalage banksiana*	2	2	22
Cardinal Myzomela	*Myzomela cardinalis*	70	26	775
Coconut Lorikeet	*Trichoglossus haematodus*	48	17	525
Collared Kingfisher	*Todiramphus chloris*	41	24	450
Glossy Swiftlet	*Collocalia esculenta*	45	15	500
Golden Whistler	*Pachycephala pectoralis*	16	13	175
House Swallow	*Hirundo javanica*	4	3	50
Melanesian Flycatcher	*Myiagra caledonica*	16	12	175
Pacific Imperial-pigeon	*Ducula pacifica*	37	22	400
Purple Swamphen	*Porphyrio porphyrio*	3	3	25
Red Junglefowl	*Gallus gallus*	10	10	100
Red-bellied Fruit-dove	*Ptilinopus greyi*	77	31	850
Silvereye	*Zosterops lateralis*	27	11	300
Swamp Harrier	*Circus approximans*	2	2	25
Tanna Fruit-dove	*Ptilinopus tannensis*	50	25	550
Uniform Swiftlet	*Aerodramus vanikorensis*	19	4	200
Vanuatu Scrubfowl	*Megapodius layardi*	3	3	25
Vanuatu Streaked Fantail	*Rhipidura spilodera*	1	1	10
Vanuatu White-eye	*Zosterops flavifrons*	61	20	675
White-breasted Woodswallow	*Artamus leucoryn*	3	1	25
White-rumped Swiftlet	*Aerodramus spodiopygius*	14	4	150

Figure 3: The relationship between habitat type and altitude for the stations surveyed for birds at North Pentecost.



21 stations were listed as Cultivated Land and Pastures, 15 as Sub/Tropical Forests and just 1 as each of Bushland or Sub/Tropical Grasslands and Savannas. The Bushland site was at 112m asl, while the Sub/tropical Grasslands site was at 40m asl. It can be seen that the majority of sites above 220 m asl were in sub/ tropical forest. However, there were 'outliers' in both habitats – with a cultivated station at 330m asl and a sub/ tropical forest station at c50m asl. When considering the distribution of each species across the Stations we will consider both whether the species are concentrated in one of the landuse types or are altitudinally restricted. Species that are concentrated in the lower altitudinal rates are likely to also be concentrated on Cultivated sites.

1.5 NATIVE SPECIES

Vanuatu Scrubfowl (*Megapodius layardi*) IUCN Red List (2022) – Vulnerable

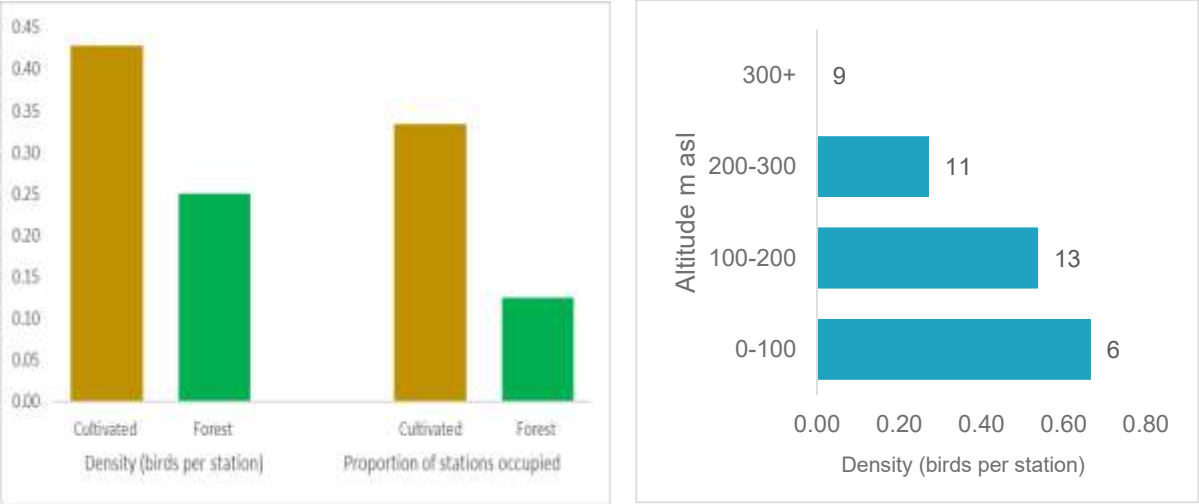
Restricted Range species, this species is endemic to Vanuatu, with an estimated global range of just 6,445km^2. The total population is estimated as between 2,500 and 9999 individuals. We can estimate that 1% of this population would be represented by 62 individuals.

Single individuals were recorded at 3 stations during the survey. Two of these stations were in Cultivated Land and Pasture while the third was in Sub/Tropical Forest site. All three records were of calling birds – some of which were estimated to be in excess of 150m from the observer. There was no evidence of a colony of burrows within the study area so, while the species is globally threatened, the numbers involved do not come close to the 62-63 individuals required to qualify the species as a trigger under either A1b or a contributory species to B2.

Brown-capped Emerald Dove (*Chalcophaps longirostris*) IUCN Red List (2022) – Least Concern

Indigenous to Vanuatu, also occurs from Timor Leste in the west, through northern Australia and New Guinea, to Solomons, New Caledonia and Vanuatu to the east. The estimated Extent of Occurrence is in excess of 12 million km^2 –the species does not qualify as restricted in range. It does not qualify as a KBA trigger species under any criteria.

Figure 4: Brown-capped Emerald Dove density and occupancy rates in a) cultivated cand and pasture and b) sub/tropical forest sites on North Pentecost.



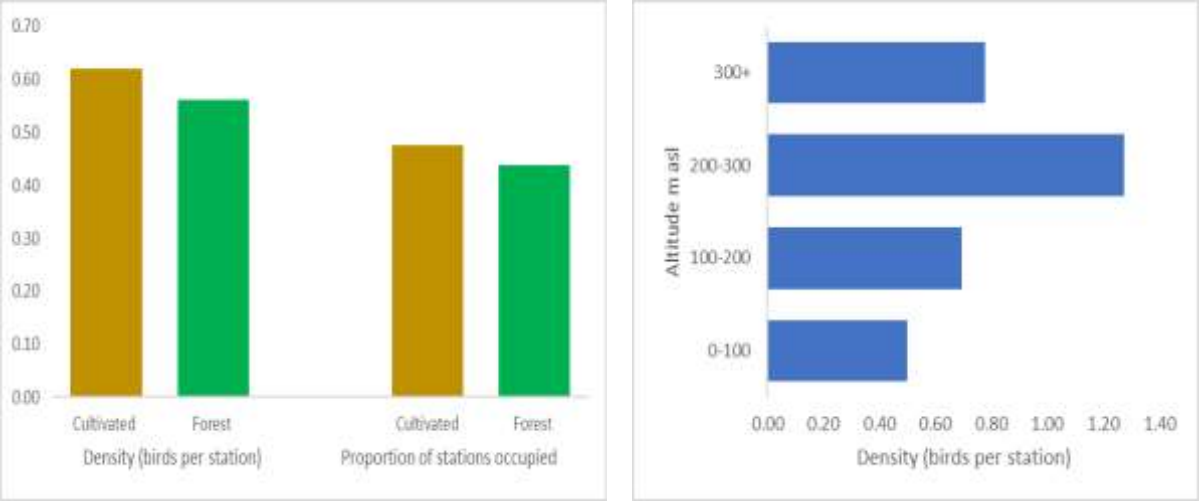
The survey recorded 15 individuals at 10 stations in the survey. The Emerald Dove occurs at a higher density on the cultivated squares compared to forest squares. There is a clear decline in occurrence – with highest densities reported below 100m asl and no birds recorded at the 9 stations located above 300m asl.

The Emerald dove was present in 1 of the 5 stations located outside the KBA – on a cultivated site at 198m asl. Its absence from the two Forest sites is unsurprising, as both sites are more than 300m asl.

Pacific Imperial-pigeon (*Ducula pacifica*) IUCN Red List (2022) – Least Concern

Indigenous to Vanuatu. Distribution from the small islands off the PNG coast eastwards as far as American Samoa, Niue and the Cook Islands. Global range, based on extent of land, is estimated at 29,566 km^2 – indicating that the Imperial-pigeon is classed as a Restricted Range species.

Figure 5: Pacific Imperial-pigeon density and occupancy rates in a) cultivated land and pasture and b) sub/ tropical forest sites on North Pentecost.



The survey recorded 37 Imperial-pigeons, at 22 stations. While there is little difference in Imperial-pigeon density between cultivated and forest stations – there is a clear preference for habitats greater than 200m asl. 6 of the 11 birds recorded on cultivated sites (55%) were on stations above 200m asl (38% of all cultivated stations). It may be that sites at greater elevation are less disturbed, even if they are cultivated, and so provide greater protection for a species that is heavily hunted in Vanuatu.

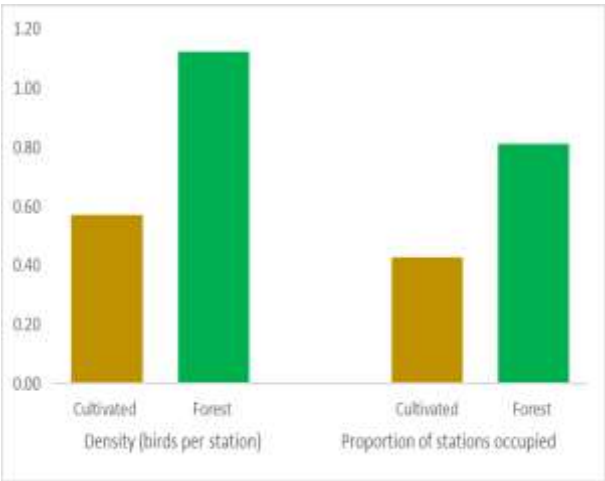
Just one of the five stations located outside the legacy KBA recorded the Imperial-pigeon (2 birds present) compared with 17 of the 33 stations within the KBA.

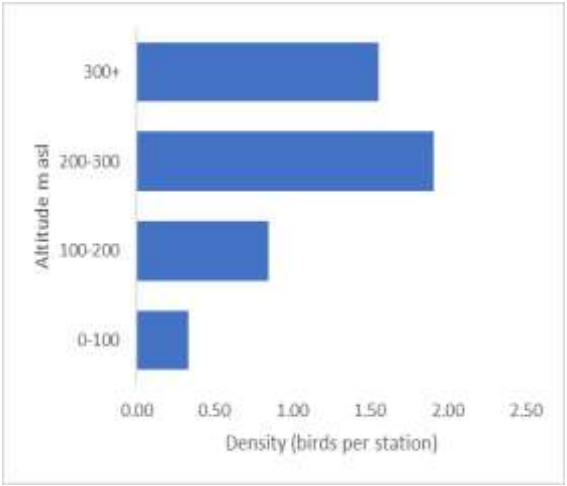
The species distribution indicates that it is present throughout the legacy KBA. However, there is no global population estimate, and so the species can only be considered as part of a Geographically restricted assemblage if the local range is 1% of the global range. The KBA is just 52.27km^2, which is less than 1% of the global range 29,566km^2.

Tanna Fruit-dove (*Ptilinopus tannensis*) IUCN Red List (2022) – Least Concern

Endemic to Vanuatu, from Aneityum in the south to the Banks Islands group in the north. There is no global population estimate for this species. The global range is estimated at c12,000km^2 – accordingly, the species is classed as 'range-restricted'.

Figure 6: Tanna Fruit-dove density and occupancy rates in a) cultivated land and pasture and b) sub/ tropical forest sites on North Pentecost.





The Fruit-dove inhabits old-growth rainforest, and also degraded habitats with large fruiting trees, including open woodland, parkland, plantations and gardens. It is most common in the lowlands and hills, but is also present in mountains to at least 1500m (BirdLife International 2023).

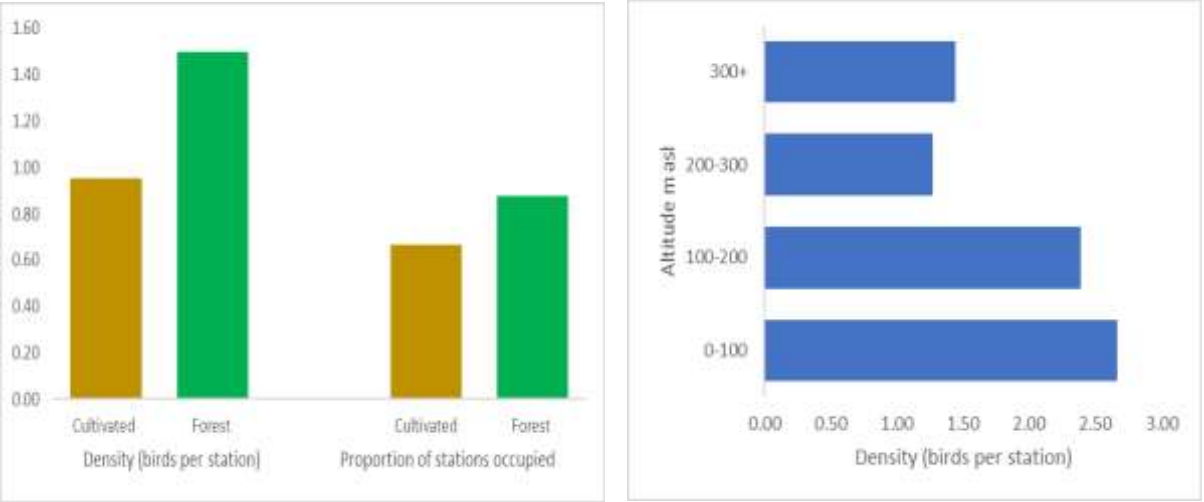
A total of 50 Tanna Fruit-dove were recorded at 25 stations during the survey. In North Pentecost the Tanna Fruit-dove is recorded at higher densities, and is more widespread, in the forested upland area (Figure 6). Densities above 200m asl are estimated to be at least twice those at lower altitudes. The species was recorded on almost 50% of all stations – with 50 birds at 17 of the 38 stations.

The Fruit-dove was recorded on 3 of the 5 stations (6 individuals) outside the KBA, suggesting that the KBA does not represent preferred habitat for the species.

Red-bellied Fruit-dove (*Ptilinopus greyi*) IUCN Red List (2022) – Least Concern

Indigenous to Vanuatu, this species can also be found in New Caledonia and the Temotu province of Solomon Islands. There is no global population estimate for this species. It qualifies as Restricted-Range, although the global range is estimated at over 32,000km^2.

Figure 7: Red-bellied Fruit-dove density and occupancy rates in a) cultivated land and pasture and b) sub/ tropical forest sites on North Pentecost.



The Red-bellied Fruit-dove is a common bird of open habitats, disturbed habitats, secondary forest and native forest. The North Pentecost survey found this to be the most common species – with 77 individuals counted on 31 of the stations. The data (Figure 7) suggests that it is more common in Forested areas although it reaches higher densities in the low-lying altitudes. This would suggest that its preferred habitat, lowland forest areas, are at risk from agricultural expansion.

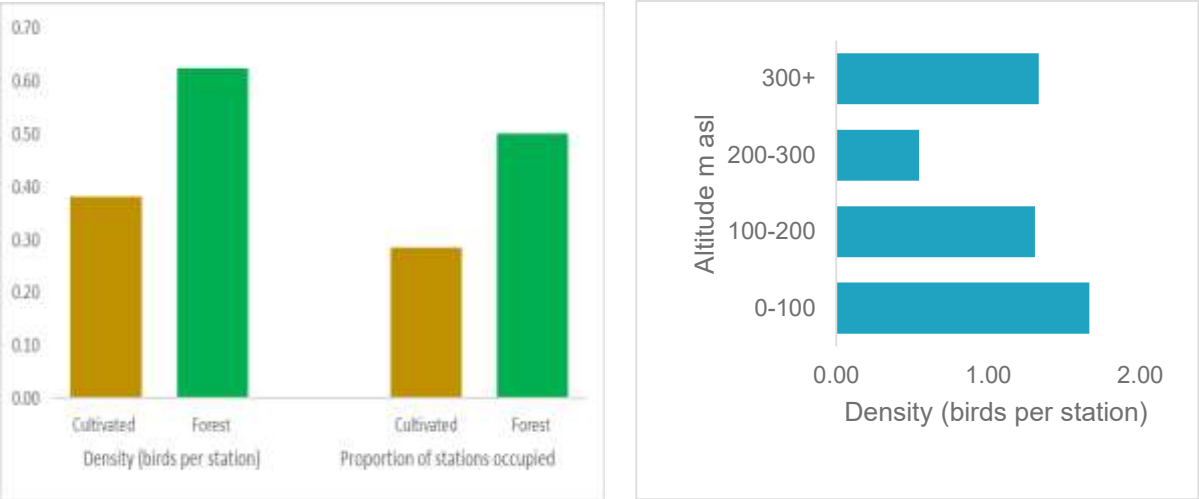
The lack of a global population estimate means that the only way that the species might trigger a KBA is if the range of the site is 1% or more of the global range. The KBA is just over 50km^2 – while the global range of this species is 32,000km^2 – the KBA is just 0.02% of the global range. The Red-bellied Fruit-dove does not qualify as a trigger species for the North Pentecost KBA under any criteria.

The Fruit-dove was recorded at just 2 of the 5 stations located outside the KBA – suggesting that the population was at higher densities within the area demarcated as the KBA.

Glossy Swiftlet (*Collocalia esculenta*) IUCN Red List (2022) – Least Concern

Indigenous to Vanuatu. Occurs from S.E. Asia, through New Guinea, Solomon Islands and New Caledonia and as far east as Vanuatu. There is no global population estimate for the species – while the global range is considered to be in excess of 2.75 million km^2. This species does not qualify as a KBA trigger species under any criteria.

Figure 8: Glossy Swiftlet density and occupancy rates in a) cultivated land and pasture and b) sub/ tropical forest sites on North Pentecost.



Glossy Swiftlet is considered to be abundant throughout its range. Within the current survey 45 birds were reported at 15 stations. The 5 minute point count method is generally considered not to be an effective means of monitoring aerial species, like swiftlets, that are very mobile. All swiftlets will have been recorded by sight – and so the variation in distribution is at least partly attributed to the extent to which the landscape is open or closed. This may better explain the apparent reduction in Swiftlet density in the mid upper range of, predominantly forest, habitats. The swiftlet is more visible over open, than forested habitats – but is also more visible in high-elevation and or ridgetop forests than lower elevations within forested areas. This species does not qualify as a trigger species for the North Pentecost KBA under any of the criteria.

The species was recorded at 2 out of the 5 stations located outside the KBA – 40% occupancy, which is the same as the 13 out of 33 stations occupied within the KBA (39% occupancy).

Uniform Swiftlet (*Aerodramus vanikorensis*) IUCN Red List Least Concern

Indigenous to Vanuatu. Range includes S.E. Asia, New Guinea and the Solomon Islands. There is no global population estimate. The global range of this species is just over 1.2 million km^2. The species does not qualify as a KBA trigger species under any criteria.

Uniform Swiftlet is considered to be abundant throughout the region. Within the current survey 19 birds were reported at just 4 locations. The comments, above, about the efficacy of 5-minute point counts to monitor swiftlets are equally relevant for this species. 10 individuals were recorded at the station based at sea level, 3 individuals at a station at 60m asl, 5 individuals at 130m asl and a single individual

recorded at the station at 302m asl. All occupied stations were on cultivated land. One of the stations was out with the KBA boundary.

White-rumped Swiftlet (*Aerodramus spodiopygius*) IUCN Red List – Least Concern

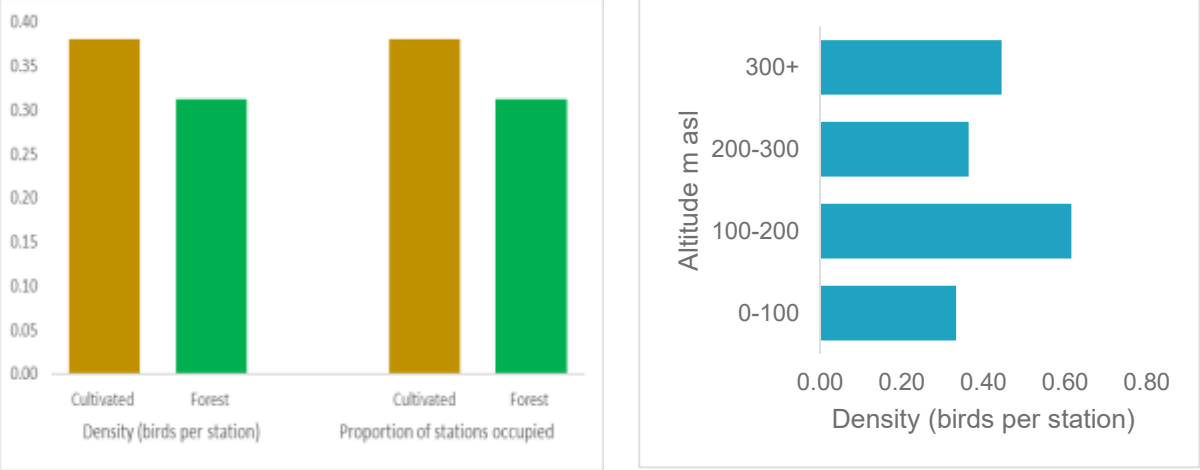
Indigenous to Vanuatu. Range extends from Manus and the Bismarck Archipelago, PNG through Solomon Islands east to Fiji, Tonga and Samoa. There is no global population estimate. Global range is estimated as just over 136 thousand km^2. The species does not qualify as a KBA trigger species under any criteria.

The survey located 14 individuals of this species, at 4 of the stations. There were 2 individuals at 112m asl, 6 at 198m asl, 1 at 239m asl and 5 at 302m asl. All stations were in cultivated land. One of the 4 stations, with 6 individuals, was outside the KBA boundary.

Buff-banded Rail (*Hypotaenidea philippensis*) IUCN Red List - Least Concern

Indigenous to Vanuatu. Occurs from SE Asia, through Australia and New Guinea, Solomon Islands, New Caledonia and Vanuatu, extending east to Samoa and New Zealand. Global Range is in excess of 2.5million km^2. The species does not qualify as a KBA trigger species under any criteria.

Figure 9: Buff-banded Rail density and occupancy rates in a) cultivated land and pasture and b) sub/ tropical forest sites on North Pentecost.



The Buff-banded Rail is common throughout much of its range. The North Pentecost survey recorded 19 birds at 13 sites. There is little evidence of variation by habitat or altitude. The species is present throughout the KBA but is not considered a trigger species for the site.

Interestingly the species was recorded at 4 of the 5 sites outside the KBA, and only 9 of the 33 sites within the KBA – suggesting that the KBA is not a preferred area for the species on Pentecost.

Purple Swamphen (*Porphyrio porphyrio*) IUCN Red List – Least Concern

Indigenous to Vanuatu. The most wide-ranging species globally on the list. This species occurs in Europe, Africa, South Asia, Australia, New Guinea, Solomon Islands, New Caledonia and Vanuatu and east to Samoa and New Zealand – a global range in excess of 18.5 million km^2. The species does not qualify as a trigger species under any of the KBA criteria.

Three individuals were recorded, one at each of 3 stations during the survey of North Pentecost. 2 of the three birds were recorded at Cultivated sites, and 2 of the three birds were recorded on stations outside the KBA. The species is not considered a trigger species for the KBA.

Common Barn-owl (*Tyto alba*) IUCN Red List – Least Concern

Indigenous to Vanuatu. Occurs in the Americas, Europe, Africa, Asia and Australasia. One of the most widely-distributed species in the world. There is no global population estimate. Global range considered to be in excess of 63 million km^2. The species does not qualify as a trigger species under any of the KBA criteria.

A single barn owl was recorded while the survey walked along the road at the northern tip of Pentecost. The area was within cultivated land and at low altitude. The 5-minute point count is not an appropriate method for surveying Barn owls, as the species is nocturnal and not active when surveys are being undertaken.

Swamp Harrier (*Circus approximans*) IUCN Red List – Least Concern

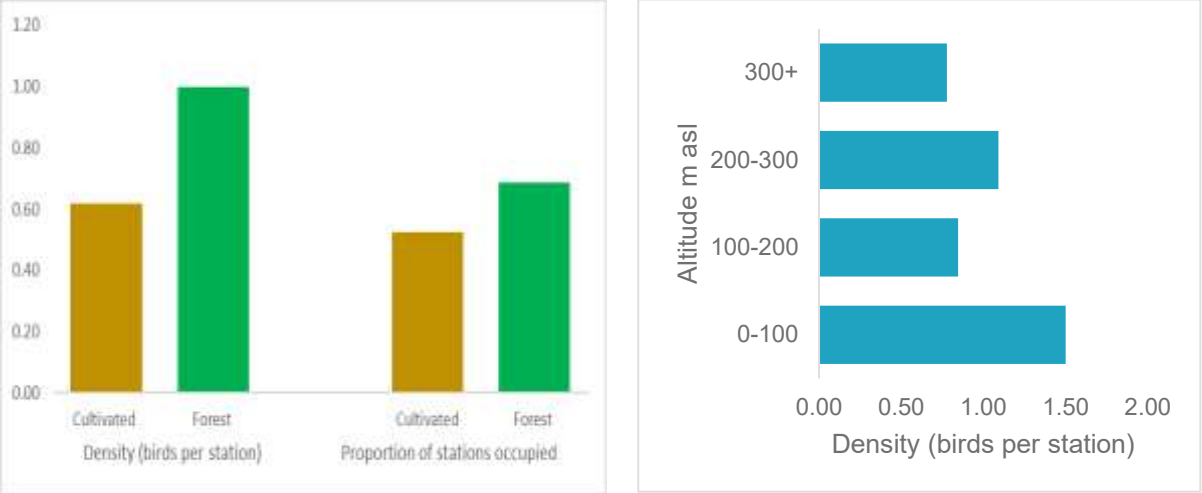
Indigenous to Vanuatu. Occurs in Australia, Solomon Islands, New Caledonia, Fiji and east to Tonga and New Zealand. Introduced to French Polynesia. There is no global population estimate. Global range in excess of 2 million km^2. The species does not qualify as a trigger species under any of the KBA criteria.

The survey on North Pentecost recorded 2 individuals at 2 stations. Both occupied stations were outside the KBA. There is, currently, no evidence that the Swamp Harrier occurs within the KBA – although the species can be challenging to survey – and covers large areas of land while foraging. It would be surprising if the KBA was not used by the species – equally it would not be surprising if the species didn't breed on the KBA. The species is, clearly, not a trigger species for the KBA.

Collared Kingfisher (*Todiramphus chloris*) IUCN Red List – Least Concern

Indigenous to Vanuatu. Ranges in the west from SE Asia through Northern Australia, New Guinea, Solomon Islands, east to Fiji, Tonga and American Samoa. There is no global population estimate. Global range is nearly 4 million km^2. The species does not qualify as a trigger species under any of the KBA criteria.

Figure 10: Collared Kingfisher density and occupancy rates in a) cultivated land and pasture and b) sub/ tropical forest sites on North Pentecost.



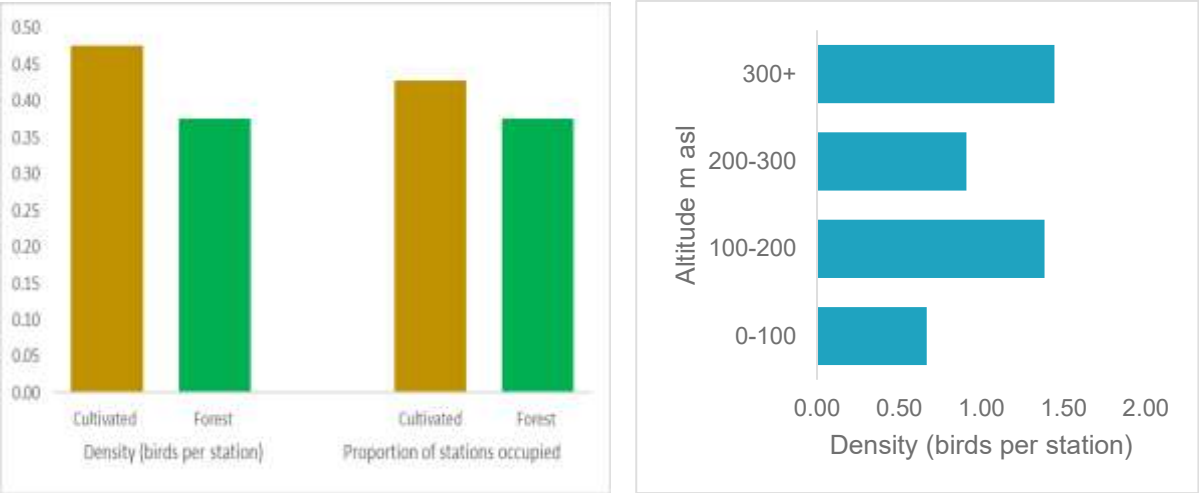
The survey of North Pentecost recorded 41 individuals at 24 stations. There is a suggestion that the birds are at higher density on lowland but forested sites although this is not very robust. The species is present in all habitats and at all altitudes.

The species was recorded at 2 of the 5 stations outside the KBA – but 22 of the 33 stations within the KBA – suggesting that the species occurs more frequently within the KBA area. However, there are no KBA criteria for the species to qualify at a site such as North Pentecost.

Coconut Lorikeet (*Trichoglossus haematodus*) IUCN Red List – Least Concern

Indigenous to Vanuatu. Global distribution includes New Guinea, Solomon Islands and New Caledonia. There is no global population estimate. The species range is estimated at 875 thousand km^2. This species does not qualify as a trigger species under any of the KBA criteria.

Figure 11: Coconut Lorikeet density and occupancy rates in a) cultivated land and pasture and b) sub/ tropical forest sites on North Pentecost.



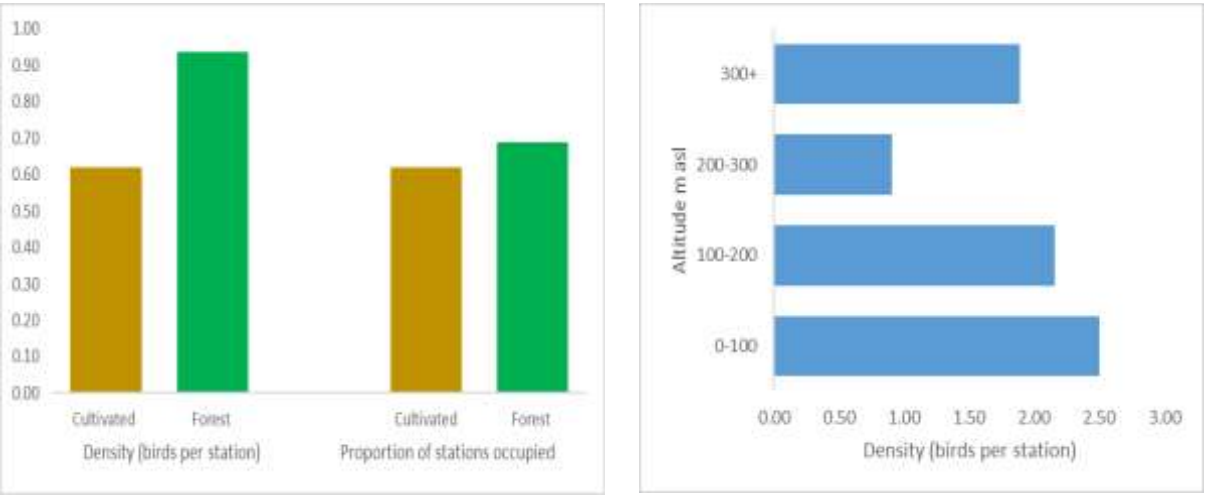
48 individuals were recorded at 17 stations within the North Pentecost KBA survey. It can be seen that there is relatively little difference in the occurrence and density of the species between cultivated and forest sites – perhaps a little surprising, although the nature of the cultivated sites meant that there remained many large trees in the area that would support the Lorikeet. Equally there is little difference in density by altitude – maybe with a preference for the mid to higher altitudes compared with the lowest. However, the species can be seen to occur throughout the habitats within the KBA. The species does not qualify under any criteria as a trigger for the North Pentecost KBA.

The species was recorded on 4 of the 5 (80%) stations outside of the KBA – but only 13 of the 33 (39%) stations within the KBA. This would indicate that the species is not concentrated within the KBA area, rather is likely to be widespread throughout North Pentecost.

Cardinal Myzomela (*Myzomela cardinalis*) IUCN Red List – Least Concern

Indigenous to Vanuatu. This species also occurs in the South of the Solomon Islands and the Loyalty Islands of New Caledonia. The species global population has not been estimated. The global range is estimated as 22,200 km^2 – making this a Restricted Range species.

Figure 12: Cardinal Myzomela density and occupancy rates in a) cultivated land and pasture and b) sub/ tropical forest sites on North Pentecost.



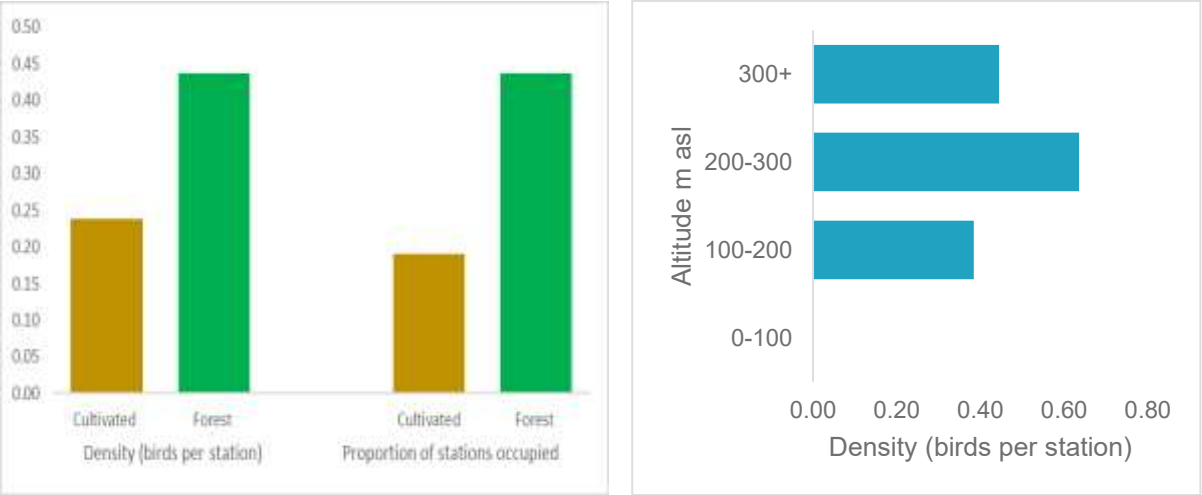
Perhaps surprisingly this is the only species of Honeyeater recorded during the bird survey of North Pentecost. 70 individuals were recorded on 26 of the stations. It is a common bird of both cultivated and forested areas (Figure 12) – and occurs at all altitudes. However, even if the myzomela is considered to occupy the whole of the KBA this still only represents 0.25% of the global range of the species. Accordingly, it does not qualify as a trigger species for the KBA.

The species was recorded on 3 of the 5 stations located outside the KBA (60%) compared with 23 of the 33 stations within the KBA (70%). There appears to be little difference in the occurrence of the species within and outwith the KBA.

Golden Whistler (*Pachycephala pectoralis*) IUCN Red List (2022) – Least Concern

Indigenous to Vanuatu. This species has a disjunct distribution with populations on islands in Indonesia, Bismarck Archipelago, Vanuatu and the Temotu province in Solomon Islands – as well as Australia and the Loyalty Islands, New Caledonia. There is no global population estimate for the species, while the global range is estimated at almost 2 million km^2. The species does not qualify under any of the KBA criteria.

Figure 13: Golden Whistler density and occupancy rates in a) cultivated land and pasture and b) sub/ tropical forest sites on North Pentecost.



The survey recorded 16 individuals on 13 sites. All but 2 of the birds were recorded based on the distinctive song. Golden Whistler can be seen to prefer forested habitats within the North Pentecost KBA area (Figure 13). There were no records of birds in the lowest altitudinal band – where cultivated land predominates.

The species was recorded on 1 of the 5 stations located outside the KBA (20%) and 12 of the 33 stations within the KBA (35%). This represents weak evidence that the KBA provides more suitable habitat for the species than areas outside the KBA.

White-breasted Woodswallow (*Artamus leucoryn*) IUCN Red List – Least Concern

Indigenous to Vanuatu. Also present from S.E. Asia, New Guinea, Australia and New Caledonia. There is no global population estimate. The global range is estimated at just over 7.5million km^2. The species does not qualify under any of the KBA criteria.

Three birds were recorded at a single location at 60m asl. This location was outside the KBA boundary. The station was located on cultivated land. It would be surprising if this species didn't occur in the KBA – however, there are no criteria that would enable the species to qualify as a trigger for the KBA.

Vanuatu Streaked Fantail (*Rhipidura spilodera*) IUCN Red List – Least Concern

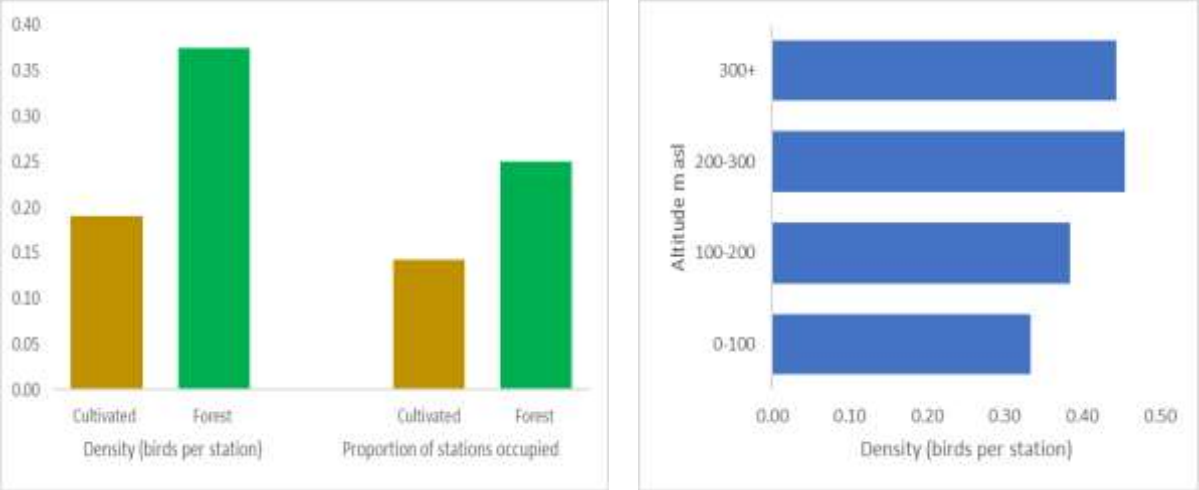
Endemic to Vanuatu from Efate to the Banks Islands. The global population size is unknown. The global range is estimated at just under 10 thousand km^2, so this can be assessed a Restricted Range species.

A single individual was recorded at 195m asl. The station was located in a forested area. The station was within the North Pentecost KBA.

Melanesian Flycatcher (*Myiagra caledonica*) IUCN Red List – Least Concern

Indigenous to Vanuatu. This species is also widespread across New Caledonia and can be found on Rennell in the Solomon Islands. There is no global population estimate. The global range is just under 31,500 km^2, so this can be assessed as a Restricted Range species.

Figure 14: Melanesian Flycatcher density and occupancy rates in a) cultivated land and pasture and b) sub/ tropical forest sites on North Pentecost.



The survey recorded 16 individuals on 12 stations. There appears to have been a preference for forested habitats, with the density of birds in forested sites being double that in cultivated sites, but no evidence of a variation with altitude. The species is less common but still present on the cultivated sites – so can be considered to be present throughout the KBA. However, even if the species is present throughout the KBA then it represents just 51/31,500 or 0.17% of the global range. Therefore the species does not qualify as a contributing species to the B2 Restricted Range for Birds criteria within the KBA.

The species was recorded at 1 of the 5 stations outside the KBA (20%) and 11 of the 33 stations within (33%). There is slight evidence that the species prefers habitat within the KBA compared with the surrounding area – but that is likely not to be significant.

Buff-bellied Monarch (*Neolalage banksiana*) IUCN Red List – Least Concern

Endemic to Vanuatu. There is no global population estimate. The Global range of this species is just short of 10 thousand km^2 (9,980) so this can be considered as a Restricted Range species.

Single individuals of this species were recorded at 2 stations during the survey. The stations were at 260m asl (Cultivated) and 298m asl (Forest). Both stations were within the legacy KBA boundary.

House Swallow (*Hirundo javanica*) IUCN Red List – Least Concern

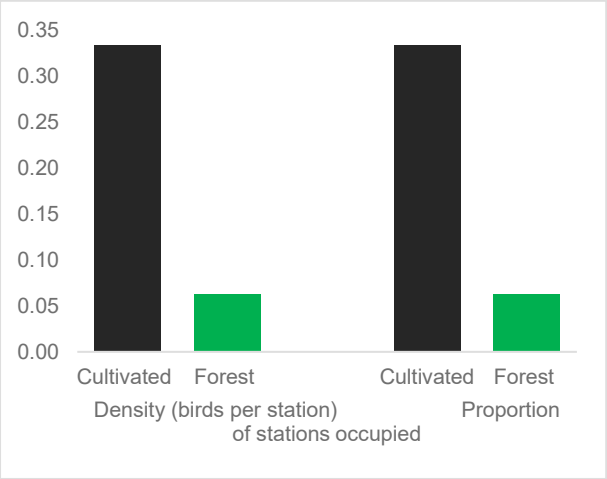
Indigenous to Vanuatu. Occurs from SE Asia through New Guinea, Solomon Islands, New Caledonia and east to Fiji and Tonga. There is no global population estimate for this species. The Global Range is estimated at just over 3.4 million km^2. This species does not qualify as a KBA trigger species under any criteria.

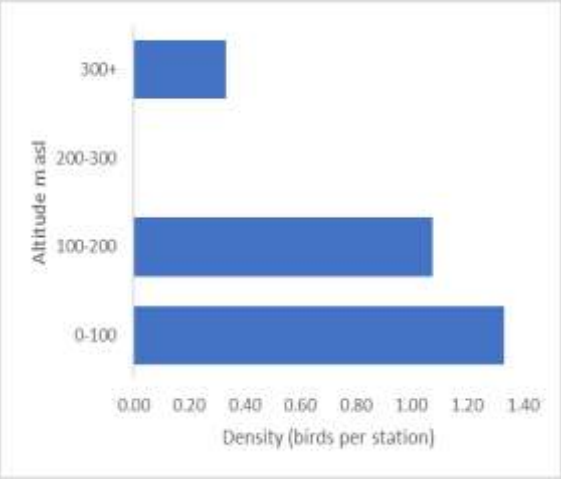
Four birds were recorded at 3 stations during the survey. Two birds were present at sea-level, with single birds at 122 and 140m asl. All three stations were within the cultivated area – and all three stations were within the traditional KBA boundary.

Silvereye (*Zosterops lateralis*) IUCN Red List – Least Concern

Indigenous to Vanuatu. This species can also be found in Australia, New Zealand, New Caledonia and Fiji. There is no global population estimate. The global range of the species is estimated at c2.7million km^2. This species does not qualify under any of the KBA criteria.

Figure 15: Silvereye density and occupancy rates in a) cultivated land and pasture and b) sub/ tropical forest sites on North Pentecost.





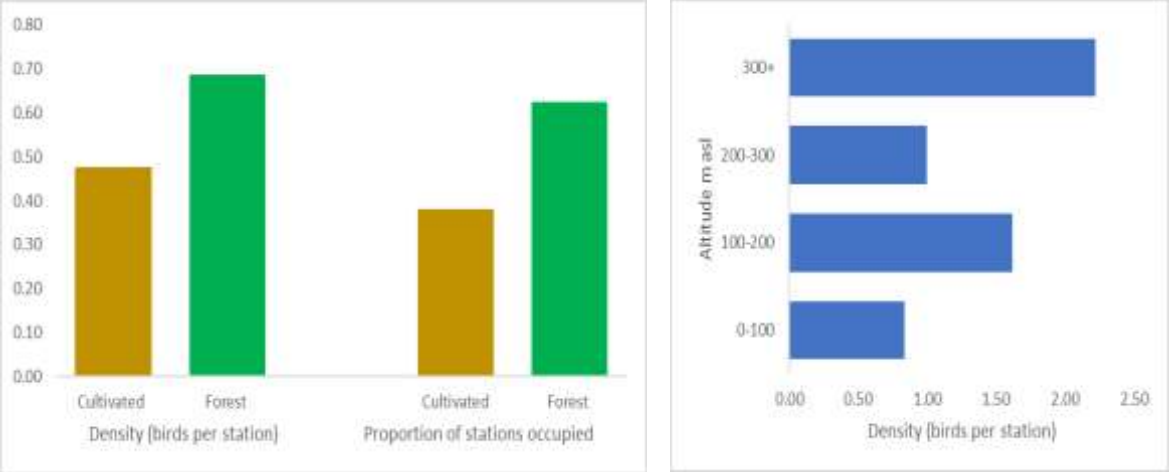
Within the survey 27 individuals were recorded at 11 stations. The Silvereye is more frequently recorded on cultivated than forested stations (figure 15). Occurrence on stations above 200m asl is also limited.

The species was recorded on 1 of the 5 stations surveyed outside the KBA (20%) and 10 of the 33 stations surveyed within the KBA (30%) – suggesting that, if anything, the species is more commonly encountered within the KBA.

Vanuatu White-eye (*Zosterops flavifrons*) IUCN Red List – Least Concern

Endemic to Vanuatu. There is no global population estimate for the species – the Global Range is estimated at just over 12 thousand km^2. This is one of the two trigger species identified for the legacy North Pentecost KBA.

Figure 16: Vanuatu White-eye density and occupancy rates in a) cultivated land and pasture and b) sub/ tropical forest sites on North Pentecost.



During the survey 61 individuals were recorded on 20 sites. The results indicate that the species is more likely to be encountered on forestry stations with a slight preference for higher altitude sites. These differences are, however, not significant and the species can be found at all altitudes and in both habitats. Despite this the species does not qualify as a trigger species for B2 under the Global KBA criteria as the KBA area is just 52km^2 which is 0.4% of the global range of the species.

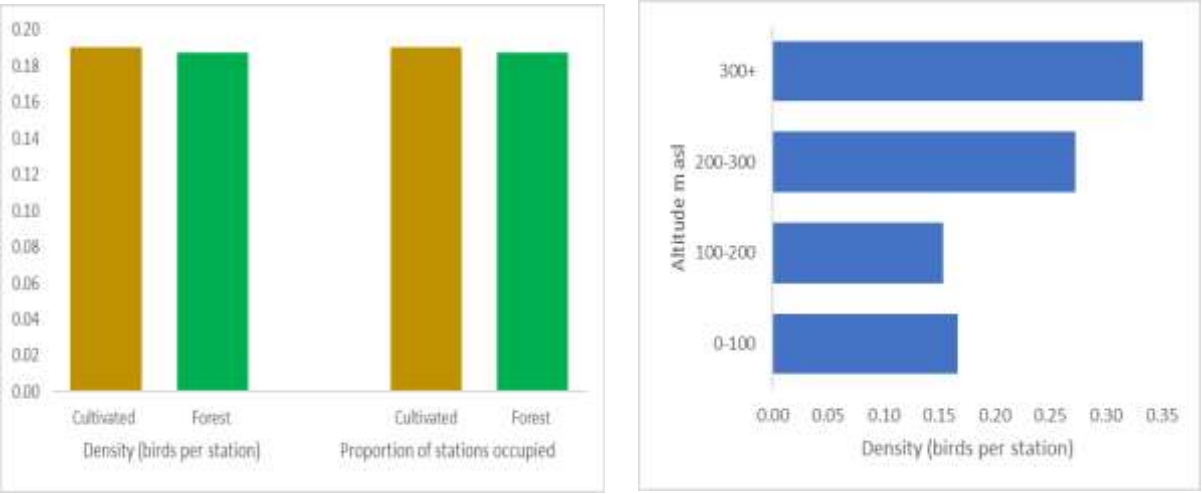
The species was recorded on 3 of the 5 stations outside the KBA (60%) and 17 of the 33 stations within the KBA (51%). There appears to be little difference in the species occurrence within and outwith the KBA boundary.

1.6 INTRODUCED SPECIES

Red Junglefowl (*Gallus gallus*) IUCN Red List – Least Concern

Introduced to Vanuatu. Originally from SE Asia, now present in a semi-wild state on all islands in Oceania.

Figure 17: Red Junglefowl density and occupancy rates in a) cultivated land and pasture and b) sub/ tropical forest sites on North Pentecost.



The survey reported 10 individuals, all by call, one individual at each of 10 stations. There was no difference between birds in cultivated or Forested habitats. However, more birds were reported at higher altitudes. Perhaps surprisingly, all 5 stations outside the KBA recorded Junglefowl, while the bird was recorded at only 5 of the 33 stations within the KBA. The junglefowl does not occur at higher densities within the KBA.

1.7 DISCUSSION

The bird survey of North Pentecost was undertaken in September 2022. This recorded 584 individuals of 24 species across 38 stations in and adjacent to the North Pentecost legacy Key Biodiversity Area. Only one of these species, the Vanuatu Scrubfowl, is considered to be globally-threatened, while a further 4 species, Tanna Fruit-dove, Vanuatu Streaked Fantail, Buff-bellied Monarch and Yellow-bellied (Vanuatu) White-eye are endemic to Vanuatu. None of these species can be considered to be trigger species for the KBA.

The KBA legacy trigger species are Vanuatu White-eye and Vanuatu Honeyeater – the former was recorded throughout the KBA but does not attain the 1% of global population (through range) on site criterion that would establish it as a species contributing to the Restricted Range B2 criteria. The Vanuatu Honeyeater wasn't recorded during the current survey, maybe because the KBA occurs at too low an altitude for the sub-species *N. c. superciliaris*, which is considered to occur, primarily, in forest above 450m asl. It is unlikely that further survey work within the KBA will uncover bird populations that qualify the site as a KBA. Most likely, perhaps, is to undertake a detailed survey of Vanuatu Scrubfowl – searching for nesting burrows. The occurrence of a colony of nesting burrows in the area is unlikely, however, as it was not mentioned by any of the local community as a potential source of protein in the area.

Previous ornithological studies on Pentecost have identified a further 15 landbirds (https://birdsofmelanesia.net/vanuatu8html/pentecost.pdf) for the islands. 11 of these have not been reported from Pentecost in the 21st Century (Palm Lorikeet, Polynesian Triller, Long-tailed Triller, Island Thrush, Fan-tailed Gerygone, Grey Fantail, Vanuatu Honeyeater, Grey-eared Honeyeater, Royal Parrotfinch, Blue-faced Parrotfinch, Rusty-winged Starling). The remaining 4 species were last recorded in 2006/07 (Mackinlay's Cuckoo-dove, Vanuatu Imperial-pigeon, Shining Bronze Cuckoo, Southern Shrikebill). It is possible that a number of these species (eg Palm Lorikeet, Royal Parrotfinch, Vanuatu Honeyeater, Rusty-winged Starling, Vanuatu Imperial-pigeon and Shining Bronze Cuckoo) are still present on the island, but at a higher altitude than was surveyed as part of this study. Further surveys are required to confirm if that is the case.

I have not been able to locate any further survey reports for the island between 2007 and 2022.

CHAPTER II

Plant Inventory and the Status of the Devil Palm Population

Figure 18: Endemic palm of North Pentecost "Niu Niu Tatu" Devil Palm (*Neoveitchia brunnea*).

2.1 INTRODUCTION

The Pacific European Union Marine Partnership (PEUMP) programme is a regional initiative funded by the European Union (EU) and Sweden to support the sustainable management and sound oceans governance for food security and economic growth, while addressing climate change resilience and conservation of marine biodiversity.

The By-Catch and Integrated Ecosystem Management (BIEM) is a component of the PEUMP initiative, which is implemented by SPREP, in cooperation with the Vanuatu Government and is overseen by an inter-department BIEM Initiative Steering Committee. The BIEM project pilot sites for BIORAP assessment are South West Bay, Wiawi and Tenmaru on Malekula and Laone and Loltong on Pentecost. These sites are Key Biodiversity Areas of interest which are the focus of the project to undertake more thorough assessments to document state of the environment and biodiversity of interest and to provide practical recommendations for the preservation of species and the ecosystems to revive the species or to recover a stagnant stock of the species.

The North Pentecost KBA BIORAP Assessment addresses biodiversity baseline data collection for Vanuatu, primarily focusing on the Vanuatu endemic palm, the Devil Palm (*Neoveitchia brunnea*) which is only found on the Northern part of Pentecost. The identified natural stands of the Devil Palm during this assessment shall form the basis for needed-ridge conservation that will ensure healthy marine ecosystem, enhancing community food security.

2.2 PURPOSE OF THE ASSESSMENT

This KBA is a priority site for the PEUMP BIEM Project, to assess and set biodiversity baseline for the KBA, primarily focusing on its trigger species, the endemic Devil Palm (*Neoveitchia brunnea*) found only in North Pentecost. This biodiversity assessment result provides terrestrial baseline data to inform sound integrated ecosystem management for North Pentecost. The specific objective of the BIORAP assessment are:

- Assess the status of the Devil Palm in north Pentecost Key Biodiversity Area and document the current population and distribution and threats.
- Assess natural habitat of the Devil Palm including assessing its natural and social threats and provide recommendations for management.
- Investigate distribution range of the species to the south with the aim of adjusting the KBA boundary.
- Prepare report with recommendations for management and conservation of the species.
- Assist to verify and collect updated information on Devil Palm distribution.

2.3 APPROACH AND METHODOLOGY

2.3.1 SAMPLING SITES

The sampling stations of interest include the four known sites assessed by Plunkett G.M in 2021 which are **Atavtabanga, Arevo, Lavatmangemu and Abwatunvutu** (Figure 1) inside the current KBA area and new sites based on community awareness and questionnaire surveys. Three new Devil Palm sites recorded are Atavtabanga (Vat Galena), Atagai and Lol Bwibwiat at Atangai villages. New sites are located based on local information from questionnaire surveys conducted in ten villages.

2.3.2 SURVEY DESIGN

The BIORAP assessment comprises three (3) key assessment protocols with corresponding sampling methodologies;

i. Standard flora checklist assessment to document associated flora species to the Devil Palm.
ii. Standard reptile and insect checklist assessment to document insects and reptile species associated to the Devil Palm and its niche habitat.
iii. Socio-land use and economic survey using an electronic questionnaire form conducted with communities living within the proximity of the Devil Palm natural stands.
iv. Assess other topographic criteria associated with Devil Palm niche habitat such as slope, elevation, distance to gardens and settlements.

2.3.3 COUNT OF STANDS

Identify the different age groups of Devils Palm and count as follows:

- Head count of every single adult stand of Devil Palm identified
- Head Count of every single seedling stand of Devil Palm identified
- Head Count of every sampling adult stand of Devil Palm identified
- Checklist of associate species found within the 100 metre radius of each stand of Devil Palm
- Identify the types of forest cover such as native, secondary, garden and kava farms
- Derive the site elevation from the map
- Collect information on the Threat to Devil Palm stands
- Document cultural significance from questionnaire surveys and from talking with the elders from adjacent communities.
- Height of palm is estimated using eye scale (no instruments used).

2.3.4 QUESTIONNAIRE SURVEYS TO GATHER PEOPLE'S PERCEPTIONS

The questionnaire surveys were conducted using an electronic questionaire designed using a computer application known as "Kobo Tool Box" and uploaded onto tablets. Electronic survey forms are used nowadays to replace the paper questionnaire forms used in the past. The survey is carried out only with some members of the communities in the vicinity of the Devils Palm stands.

2.4 RESULTS AND DISCUSSIONS

2.4.1 TRAVEL PLANNING AND ASSESSMENT TEAM

A team of four members from Department of Forestry, Department of Environment Protection and Conservation DEPC, University of South Pacific, USP and Eco-Lifelihood Development Association, EDA' undertook this field work from 14th to 21st October 2022. The team members are:

- Dean Wotlolan – Biodiversity & Conservation Division, DEPC
- Thomas Doro – Department of Forestry
- Kingsley Baereleo – Eco Livelihood Development Association
- Trevor Leodoro – University of the South Pacific

Travelling to Pentecost was by sea on Vanuatu Ferry and return to Vila by Vanuatu Cargo and the following people assisted in the planning and communications in regard to this trip. During the period of this fieldwork, Sara Airport in North Pentecost was closed so the only means of travel was by sea.

Table 2: Logistical planning of the trip.

Organization	Name	Position
PEUMP /BIEM	Kalo Pakoa	Country coordinator
DEPC	Rolenas Baereleo	B&C Principal officer, DEPC
Department of Forestry	Presley Dovo	Senior Herbarium Curator
USP	Dr. Krishna Kotra	Science Program Coordinator

2.4.2 ASSESSMENT SITES AND KBA BOUNDARY

Awareness meetings were conducted with 7 communities inside and outside the KBA area. From these meetings the six (6) sites of Devil Palm stands were identified for assessment surveys (Table 2). With the help of the local guides the team visited the sites and conduct the surveys. The 6 sites included 3 sites, previously assessed

in 2021 including Lol Niuniu Tatu, Lol Ureure and Abwatunbutu and 3 new sites first assessed in 2022 including Atavtabanga, Atagai, Lol Bwibwi. One site assessed in 2021 was not assessed. This is the site surveys indicated to be further down from Atanagi.

The terrestrial BIORAP assessment sites are associated with the natural stand of the endemic palm of North Pentecost *Neoveitchia brunnea* or Devil Palm. The four sites of Lol Niuniu Tatu, Adovungai, Lol Ureure, Tangai and Lol Bwibwi are located along the mountain range running along the east of the island. Four of the sites assessed are inside the existing KBA boundary. The record of two new sites at Lol Bwibwi and Faririm at Nabarangiut are located South West of the current KPA boundary. We propose that the KBA boundary can be extended to cover these new stands. These new stands were not recorded by Greg M Plunkett (2021) and represent new records of *Neoveitchia brunnea* stands which further extend the distribution range of the species (figure 18).

Table 3: Location of assessment sites.

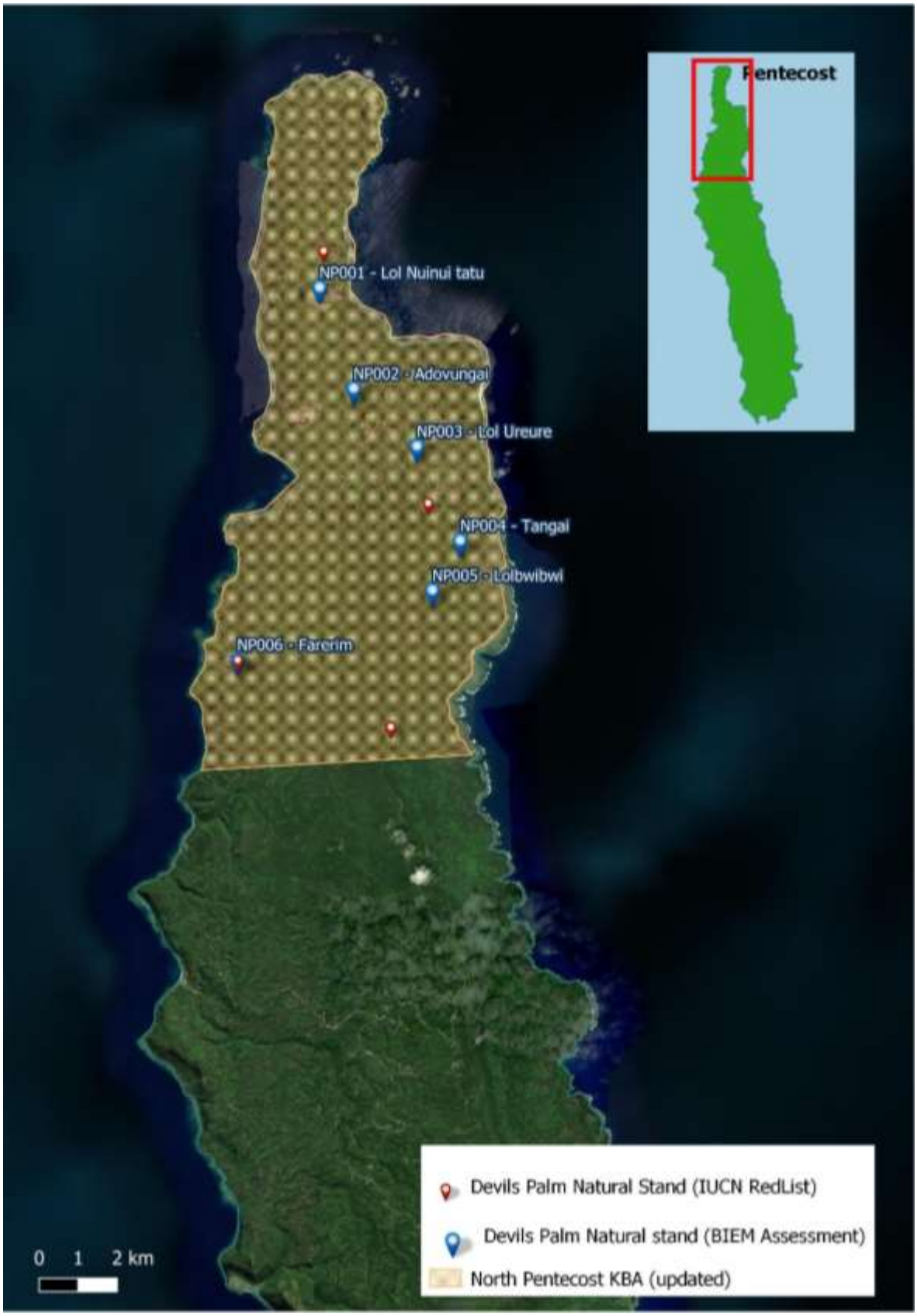
Community	Assessments Sites 2022	Plunkett G.M Assessment Sites 2021
Lol Niuniu Tatu village	Lol Niuniu Tatu	New site
Atavtabagnaga village	Avat Galanga	✓
Arevo Village	Lol UreUre	✓
Atangai Village	Atangai	New site
Atangai Village	Lol Bwibwi	New site
Lavatmangemu Village	Lavatmangemu	Not assessed
Abwantunbutu Village	Farerim	✓

Because of the belief that evil spirits fed on the fruits (nut) of Devil Palm and local belief that a poison could be concocted from the bark which could cause women to become sterile and men could be killed, this has led to unpopularity of the palm and knowledge of the species has started to disappear. For instance the people of Loltong and Laone interviewed in 2021 do not know the palm, especially young and middle-age people. During the village meetings photographs of the palm species was shown and community elders were able to indicate the location of the stands.

At Tangai, the local residents were able to locate the stands at Lol Bwibwi which was found to be an important site with the highest number of young trees. Further the community indicated presence of a few more Devil Palm stands located further down from the village towards the boundary of North Pentecost and Central Pentecost Area 1 but which the team was not able to visit because of limited time.

With the new findings, it is recommended that the KBA area be extended to the south to cover the two new natural stands. Further it is recommended that another assessment be conducted further down from Lol Bwibwi to confirm the information from the community. If correct then the KBA boundary may need to be further extended to cover all the Devil Palm stands on North Pentecost.

Figure 19: BIORAP assessment sites in North Pentecost (blue are new sites, orange are sites assessed by Plunkett GM 2021).



2.4.3 PENTECOST KBA LAND COVER AND LAND USE

The Vanuatu Resource Information System (VANRIS 1993) has indicated thickets with open structure as dominant land cover for the North Pentecost KBA, with several patches of coconut-dominated plantations towards the north of the island and south of Loltong. North Pentecost is a highly populated area and land cultivation can be classed as intensive. The 1993 VANRIS data indicated 9 major built-up and settlement areas for North Pentecost. During the terrestrial BIORAP assessment, the team observed a vast increase in settlements and agricultural areas, dominated by kava plantations. The team also observed that even though the VANRIS 1993 data showed no indication of primary forest cover, the majority of the assessment sites are confirmed as primary forest area with a relatively high ground and canopy cover.

The mountain range spans the length of the island and divides the generally humid and rainy eastern coast and the more temperate western coast. The coastal plains are lined with many creeks and rivers and generally contain very fertile soil. North Pentecost is relatively more developed than the other parts of the island and has the largest population of over 5800 residents (Census 2009, VNSO). It is evident that the current intact primary forest for the North Pentecost area is threatened by population pressures for new settlements, agriculture and commercial farming. This threat is greater on the western part of the island, due to the less accessible and mostly inhabitable rough terrain of the eastern part of the island. This results in more intact primary mountain cloud forest cover on those assessment sites than are on the eastern part of the island.

Questionnaire surveys carried out to assess people's perception of community land use and land cover and socio-land use data to confirm how communities are currently using their land and for what purposes. A key result of the survey showed that garden area had increased while 6 people indicated gardening area had reduced (figure 20). In respect to kava cultivation the survey reveals there are more land being used for the farming of kava. Pentecost is one of the main kava suppliers in Vanuatu and this is related to increase cultivation of kava by many farmers as a source of income (figure 21).

Figure 20: Change in perceived area of subsistence gardens at North Pentecost.

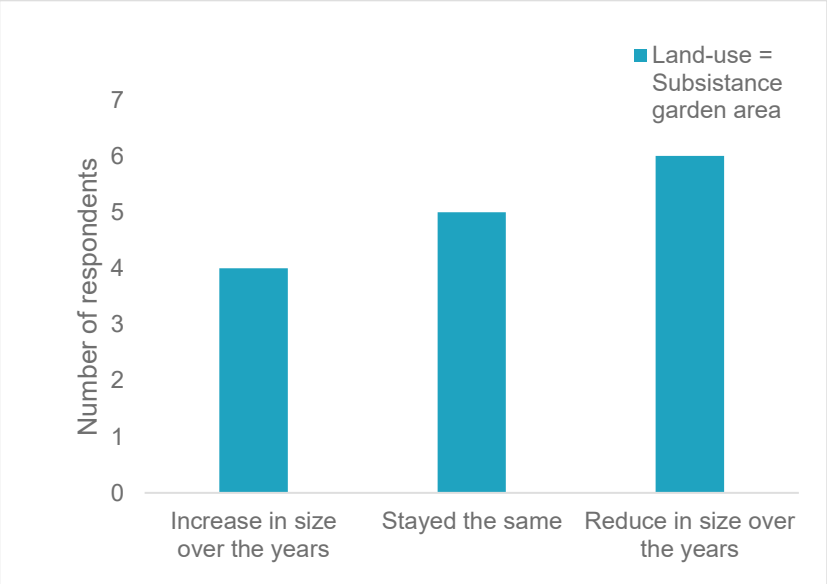
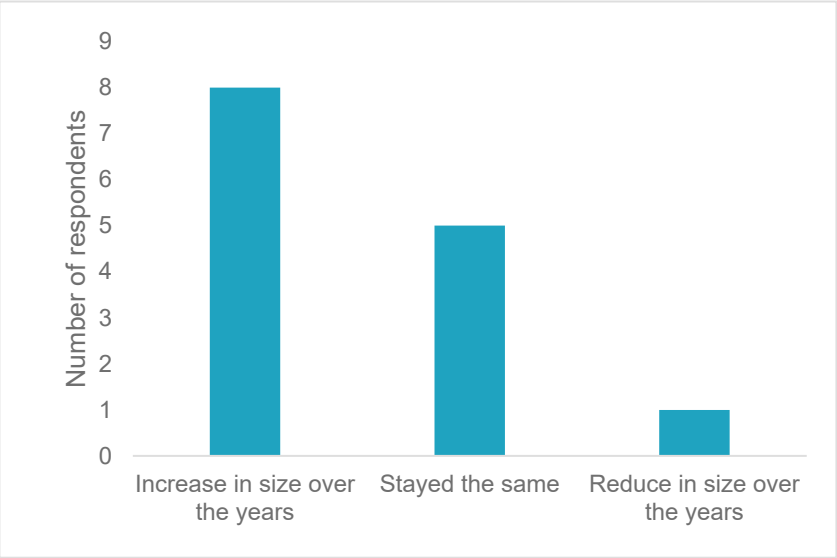


Figure 21: Change in perceived size of kava gardens at North Pentecost.



2.4.4 THE DEVILS PALM STOCK AND DISTRIBUTION

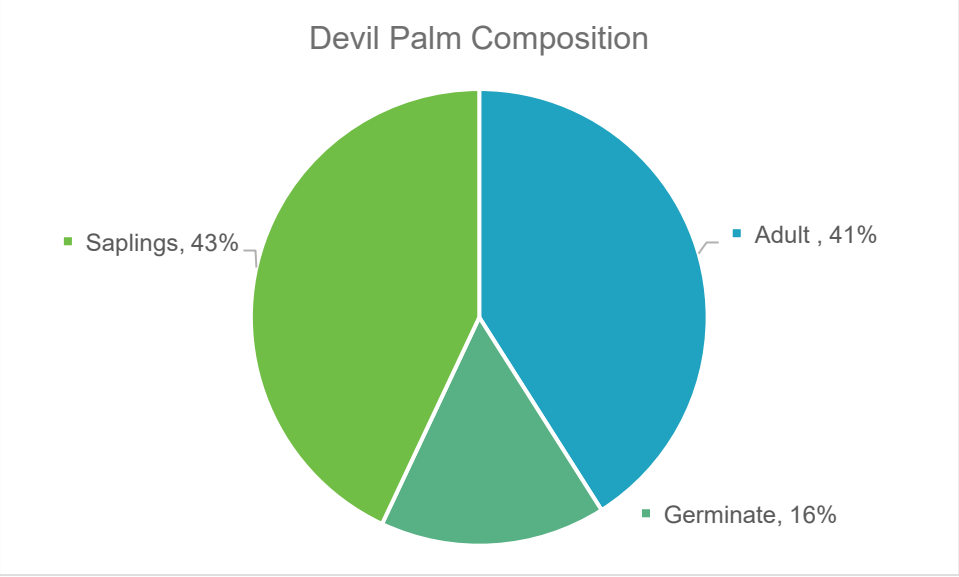
The survey recorded 138 Devil Palm trees in total, with 56 adults (41% of total), 58 (43% of total) saplings and 22 germinated seedlings (16% of total) (Table 4 and Figure 19). This is higher than that recorded in 2021, when there were fewer than 50 adults and less than 5 seedling or saplings. The increase is based on the number of adult palms recorded at the three new sites and an increasing number of young palm trees (germinated seedlings and Sapling or young Palm trees) recorded at all sites. The new germinated nuts may be present due to reduced canopy following TC Harold in 2020 which allowed sunlight into the understory and germination of nuts. The new natural stands at Avat Galena at Atavtabanga village, Atangai and Lol Bwibwi contributed to the increase of 77 individuals (60 seedlings and 17 adults) in the number of Devil Palm.

The fourth site identified in 2021 at Lavatmangemu was not assessed due to limited time. The people of Atangai indicated to the survey team that there were more Devil Palm stands further south towards the boundary with Central Pentecost. However the team did not have enough time to assess the last site. The total number of Palm recorded would be higher including the unaccessed site. The existing KBA area did not include the two southern most sites, Lavatmangemu and Abwantunbutu, which were assessed in 2021 (Plunkett 2021) for some reason and so the KPA boundary line should be revised and extended to the boundary limit of the North Pentecost Area Council (see Figure 19).

Table 4: Distribution of Devil Palm and stand details.

Site	Plunket 2021	No. Adult Stand	Average Height (m)	No. Germinated Seedlings	No. Saplings	Forest type	Elevation	DPH of Adult	Canopy Cover	Ground Cover
Lol Niuniu Tatu	New	1	8	1	5	Secondary forest	365m	20cm	20%	80%
Atavtabanga (Avat Galena)	Same	5	15-20	1	0	Cloud forest	296m	20cm	30%	50%
Lol Ureure	Same	38	25-30	3	8	Cloud forest	286m	20cm	90%	90%
Atangai	Same	2	10	4	4	Cloud forest	241m	20cm	90%	70%
Lol Bwibwi	New	10	15-25	10	41	Cloud forest	322m	20cm	90%	90%
Abwatunbutu (Avwaririm)	Same	2	15	3	0	Low land secondary forest	186m	20cm	50%	70%
Lavatmangemu						No assessment				

Figure 22: Devil Palm stock composition.



In several sites, heavy canopy shading prevents the growth of young palms - something that could be addressed. Conversely, the Avwaririm stand is inside a cattle ranch and no young trees were found due to grazing of new growth. Special attention is needed to protect stands inside cattle ranches, gardens and near settlements. It appears that the Devil Palm is commonly found in high elevation cloud forest, distinctively on the slope face of the ridge. Past assessment (Plunkett 2021) recorded not more than 50 adult stands at four sites.

This survey also recorded taller mature palm at Avat Galena, Lol Ureure and Lol Bwibwi and Avwaririm at 15m to 30m on average compared to height reported previously at 8 – 10 meters average height (Plunkett 2021). The tall trees recorded recently are older trees growing in the valley and on the side of a steep hill and amongst older tall trees which cause them to grow taller in search for sunlight.

According to the associated plant species checklist, five plant species were found to be highly associated with the natural stand for Devil Palm, these are *Miristica sp*, *Asplenium sp*, *Dicksonia sp*, semi *Semicarpus sp* and *Veitchia sp*.. *Semicarpus sp* and *Veitchia sp*.

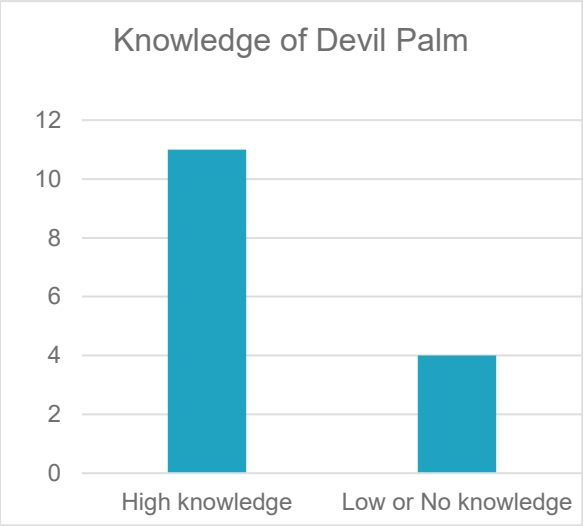
In the assessment of community knowledge on the Devil Palm, its habitat and distribution range, including its associated threats was recorded. The majority of the respondents have seen and have good knowledge of the Devil Palm. Regardless of its uselessness to the communities, some have indicated that the palm apple or “navara” is sweet and is edible, by humans and rodents.

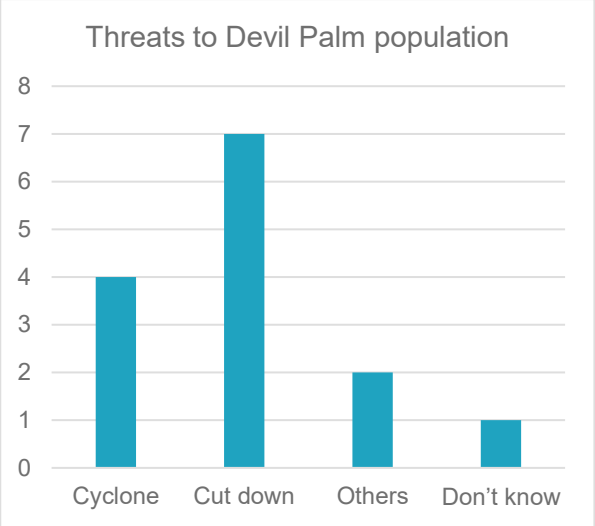
One individual reported that the leaves were used in the past as substitutes for the “Natangura” for thatched-roof weaving. He also mentioned that the leaves were used by mothers by smoothly ripping the leaflets in half to confirm virginity of their daughters during engagement ceremonies. Most communities have associated the palm to evil beliefs, stating the palm can bring bad luck, illness or even death, to households who have these palms planted near their houses.

Out of the participants that are familiar with the Devil Palm, 60% conveyed that the population of Devil Palm in their area has diminished over the last 10 years. Bush clearing for gardens and new roads (Cut down) are reported as the main cause of the drop in Devil Palm population, followed by natural extreme events such as cyclones and landslides. Cattle grazing was also found to be responsible for lack of saplings at Avwiririm.

Figure 23: Devil Palm tree in kava farm.

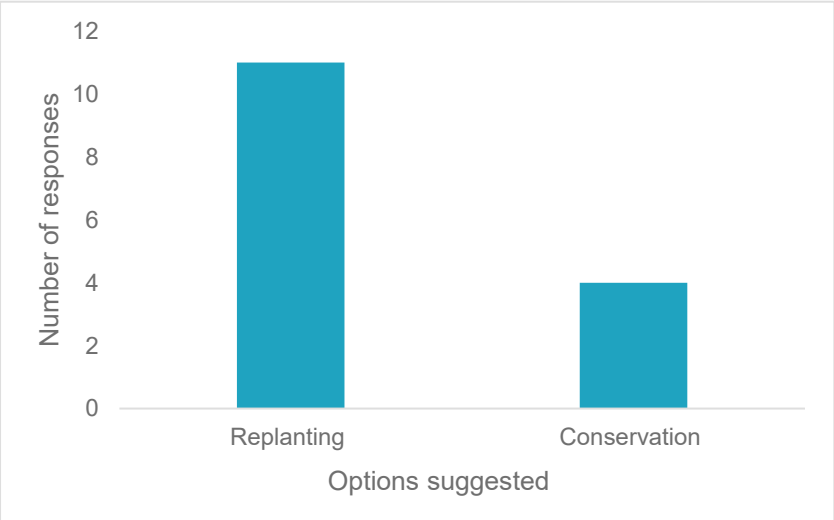
Figure 24: People's perception of Devil Palm, knowledge (L) and threats (R).





The participants to the survey also suggested some mitigation activities to properly manage the Devils palm population in their area. Almost 75% person of the participants thinks that replanting of seedlings, either in ex situ or in-situ is the best management practice for Devil Palm, and 25% stated that their natural habitat should be protected or conserved. The best option would be to encourage replanting in a conservation area to offer maximum protection from human induced damages.

Figure 25: Mitigation measures to conserve Devil Palm.



2.4.5 FAUNA ASSESSMENT

Due to bad weather, insect and reptile assessments were left out of the survey. So there is no information on faunal interaction with Devil Palm. However it is known that rodents are the usual pest for Devil palm nuts, the mature nut provides good nutrition for rodents which contributed to the rarity of the palm. Birds such as parrots and other smaller birds and insects are associated with the palm flowers and pollination of the flowers. Faunal assessment will need to be conducted in future surveys, especially during the dry season.

2.4.6 CHECK LIST OF PLANTS RECORDED OVERALL AT THE KBA

The checklist for plants at North Pentecost KBA for all the six (6) sites aggregated is presented here. Table 5 present total checklist for all species recorded in the (6) six sites followed by checklist of all fern species recorded at the 6 sites and table 7 provide associated species of Devil Palm (within the 10 meter radius of the stands table 7. In total 197 plant species was recorded in North Pentecost KBA overall, and the plants are dominated by Dicotyledonous plants.

Table 5: North Pentecost KBA floral checklist (total checklist for all six sites assessed).

Class	Taxon Group (KBA B2)	Family	Scientific name	Native/ Endemic	IUCN Red List
Dicot	Lamiales	Acanthaceae	*Hemigraphis alternata*	Introduced	NE
Dicot	Lamiales	Acanthaceae	*Pseuderanthemum aubertii*	Endemic	NE
Dicot	Lamiales	Acanthaceae	*Pseuderanthemum carruthersii*	Native	NE
Dicot	Lamiales	Acanthaceae	*Pseuderanthemum*		
Dicot	Malpighiales	Achariaceae	*Pangium edule*	Native	LC
Dicot	Caryophyllales	Aizoaceae	*Sesuvium portulacastrum*	Native	LC
Dicot	Caryophyllales	Amaranthaceae	*Achyranthes aspera*	Introduced	NE
Dicot	Caryophyllales	Amaranthaceae	*Cyathula prostrata*	Native	NE
Dicot	Caryophyllales	Amaranthaceae	*Deeringia arborescens*	Introduced	NE
Dicot	Caryophyllales	Amaranthaceae	*Iresine herbstii*	Introduced	NE
Dicot	Sapindales	Anacardiaceae	*Dracontomelon vitiense*	Native	NE
Dicot	Sapindales	Anacardiaceae	*Pleiogynium timoriense*	Native	NE
Dicot	Sapindales	Anacardiaceae	*Semecarpus vitiensis*	Native	NE
Dicot	Sapindales	Anacardiaceae	*Spondias dulcis*	Introduced	NE
Dicot	Magnoliales	Annonaceae	*Cananga odorata*	Introduced	NE
Dicot	Apiales	Apiaceae	*Centella asiatica*	Native	NE
Dicot	Gentianales	Apocynaceae	*Alyxia efatensis*	Endemic	NE
Dicot	Gentianales	Apocynaceae	*Cerbera odollam*	Native	LC
Dicot	Gentianales	Apocynaceae	*Hoya samoensis*	?	
Dicot	Gentianales	Apocynaceae	*Kopsia flavida*	Native	NE
Dicot	Gentianales	Apocynaceae	*Ochrosia oppositifolia*	Native	NE
Dicot	Gentianales	Apocynaceae	*Tabernaemontana pandacaqui*	Native	LC
Dicot	Gentianales	Apocynaceae	*Vincetoxicum biglandulosum*	Native	NE
Dicot	Alismatales	Araceae	*Epipremnum pinnatum*	Native	NE
Dicot	Alismatales	Araceae	*Rhaphidophora*		
Dicot	Apiales	Araliaceae	*Meryta neoebudica*	Nr Endemic	NE
Dicot	Apiales	Araliaceae	*Polyscias cumingiana*	Native	NE
Dicot	Apiales	Araliaceae	*Polyscias multijuga*	Native	NE
Dicot	Apiales	Araliaceae	*Polyscias samoensis*	Native	LC
Dicot	Apiales	Araliaceae	*Polyscias scutellaria*	Native	NE
Dicot	Apiales	Araliaceae	*Schefflera neoebudica*	Endemic	NE

Dicot	Piperales	Aristolochiaceae	*Aristolochia vitiensis*	Native	NE
Dicot	Piperales	Aristolochiaceae	*Aristolochia sp.*		
Dicot	Asterales	Asteraceae	*Blumea riparia*	Native	NE
Dicot	Asterales	Asteraceae	*Emilia sonchifolia*	Introduced	NE
Dicot	Asterales	Asteraceae	*Mikania micrantha*	Introduced	NE
Dicot	Asterales	Asteraceae	*Wollastonia biflora*	Native	NE
Dicot	Lamiales	Bignoniaceae	*Dolichandrone spathacea*	Native	NE
Dicot	Boraginales	Boraginaceae	*Cordia dichotoma*	Native	LC
Dicot	Boraginales	Boraginaceae	*Cordia subcordata*	Native	LC
Dicot	Boraginales	Boraginaceae	*Heliotropium foertherianum (arboretum)*	Native	LC
Dicot	Boraginales	Boraginaceae	*Heliotropium indicum*	Introduced	NE
Dicot	Brassicales	Brassicaceae	*Rorippa sarmentosa*	Native	NE
Dicot	Sapindales	Burseraceae	*Canarium indicum*	Native	LC
Dicot	Sapindales	Burseraceae	*Garuga floribunda*	Native	LC
Dicot	Malpighiales	Calophyllaceae	*Calophyllum inophyllum*	Native	NE
Dicot	Rosales	Cannabaceae	*Celtis paniculata*	Native	NE
Dicot	Rosales	Cannabaceae	*Trema cannabina*	Native	NE
Dicot	Brassicales	Capparaceae	*Capparis spinosa*	Native	NE
Dicot	Fagales	Casuarinaceae	*Casuarina equisetifolia*	Native	LC
Dicot	Myrtales	Combretaceae	*Terminalia catappa*	Native	LC
Dicot	Myrtales	Combretaceae	*Terminalia sepicana*	Native	NE
Dicot	Solanales	Convolvulaceae	*Aniseia martinicensis*	Introduced	LC
Dicot	Solanales	Convolvulaceae	*Decalobanthus peltatus*	Native	NE
Dicot	Solanales	Convolvulaceae	*Ipomoea indica*	Introduced	NE
Dicot	Solanales	Convolvulaceae	*Ipomoea pes-caprae*	Native	LC
Dicot	Solanales	Convolvulaceae	*Ipomoea quamoclit*	Introduced	NE
Dicot	Solanales	Convolvulaceae	*Stictocardia tiliifolia*	Native	NE
Dicot	Cornales	Cornaceae	*Alangium vitiense*	Native	LC
Dicot	Cucurbitales	Corynocarpaceae	*Corynocarpus similis*	Endemic	NE
Dicot	Cucurbitales	Cucurbitaceae	*Diplocyclos palmatus*	Native	NE
Dicot	Cucurbitales	Cucurbitaceae	*Trichosanthes dieniensis*	Introduced	NE
Dicot	Malpighiales	Dichapetalaceae	*Dichapetalum timoriense*	Native	LC
Dicot	Malpighiales	Dichapetalaceae	*Dichapetalum vitiense*	???	
Dicot	Dilleniales	Dilleniaceae	*Dillenia biflora*	Native	NE
Dicot	Ericales	Ebenaceae	*Diospyros samoensis*	Native	LC
Dicot	Malpighiales	Euphorbiaceae	*Acalypha caturus*	Native	LC
Dicot	Malpighiales	Euphorbiaceae	*Acalypha forsteriana*	Endemic	NE
Dicot	Malpighiales	Euphorbiaceae	*Acalypha grandis*	Native	NE
Dicot	Malpighiales	Euphorbiaceae	*Acalpyha sp.*		
Dicot	Malpighiales	Euphorbiaceae	*Aleurites moluccanus*	Native	NE
Dicot	Malpighiales	Euphorbiaceae	*Claoxylon sp(gillisonii?)**	Endemic	NE
Dicot	Malpighiales	Euphorbiaceae	*Claoxylon psilogyne*	Endemic	NE
Dicot	Malpighiales	Euphorbiaceae	*Cleidion brevipetiolatum*	?	
Dicot	Malpighiales	Euphorbiaceae	*Cleidion javanicum*	Native	LC

Dicot	Malpighiales	Euphorbiaceae	*Codiaeum variegatum*	Native	LC
Dicot	Malpighiales	Euphorbiaceae	*Croton sp (levatii?)**	Endemic	NE
Dicot	Malpighiales	Euphorbiaceae	*Euphorbia hyssopifolia*	Introduced	NE
Dicot	Malpighiales	Euphorbiaceae	*Endospermum medullosum*	Native	VU
Dicot	Malpighiales	Euphorbiaceae	*Excoecaria agallocha*	Native	LC
Dicot	Malpighiales	Euphorbiaceae	*Homalanthus nutans*	Native	LC
Dicot	Malpighiales	Euphorbiaceae	*Macaranga dioica*	Native	LC
Dicot	Malpighiales	Euphorbiaceae	*Macaranga tanarius*	Native	LC
Dicot	Malpighiales	Euphorbiaceae	*Pimelodendron amboinicum*	Native	NE
Dicot	Fabales	Fabaceae	*Acacia simplex*	Native	LC
Dicot	Fabales	Fabaceae	*Acacia spirorbis*	Native	LC
Dicot	Fabales	Fabaceae	*Adenanthera pavonina*	Native	NE
Dicot	Fabales	Fabaceae	*Albizia lebbeck*	Introduced	NE
Dicot	Fabales	Fabaceae	*Bauhinia variegata*	Introduced	NE
Dicot	Fabales	Fabaceae	*Caesalpinia crista*	Native	NE
Dicot	Fabales	Fabaceae	*Cajanus cajan*	Introduced	NE
Dicot	Fabales	Fabaceae	*Calopogonium mucunoides*	Introduced	NE
Dicot	Fabales	Fabaceae	*Cynometra ramiflora*	Native	NE
Dicot	Fabales	Fabaceae	*Dendrolobium umbellatum*	Native	NE
Dicot	Fabales	Fabaceae	*Derris trifoliata*	Native	NE
Dicot	Fabales	Fabaceae	*Desmodium incanum*	Introduced	NE
Dicot	Fabales	Fabaceae	*Entada phaseoloides*	Native	NE
Dicot	Fabales	Fabaceae	*Erythrina fusca*	Native	NE
Dicot	Fabales	Fabaceae	*Erythrina variegata*	Native	LC
Dicot	Fabales	Fabaceae	*Flemingia strobilifera*	Introduced	NE
Dicot	Fabales	Fabaceae	*Hanslia ormocarpoides*	Native	NE
Dicot	Fabales	Fabaceae	*Indigofera zollingeriana*	Native	NE
Dicot	Fabales	Fabaceae	*Inocarpus fagifer*	Native	NE
Dicot	Fabales	Fabaceae	*Intsia bijuga*	Native	NE
Dicot	Fabales	Fabaceae	*Leucaena leucocephala*	Introduced	NE
Dicot	Fabales	Fabaceae	*Mimosa pudica*	Introduced	NE
Dicot	Fabales	Fabaceae	*Pongamia pinnata*	Native	NE
Dicot	Fabales	Fabaceae	*Pongamia sp.*		
Dicot	Fabales	Fabaceae	*Pterocarpus indicus*	Native	EN
Dicot	Fabales	Fabaceae	*Pueraria montana var. lobata*	Introduced	NE
Dicot	Fabales	Fabaceae	*Schleinitzia insularum*	Native	NE
Dicot	Fabales	Fabaceae	*Senna obtusifolia*	Introduced	NE
Dicot	Fabales	Fabaceae	*Senna occidentalis*	Introduced	LC
Dicot	Fabales	Fabaceae	*Sohmaea zonata*	Native	NE
Dicot	Fabales	Fabacea	*Uraria sp.*		
Dicot	Fabales	Fabaceae	*Vigna marina*	Native	LC
Dicot	Lamiales	Gesneriaceae	*Cyrtandra aneiteensis*	Endemic	NE
Dicot	Lamiales	Gesneriaceae	*Cyrtandra sp.*		
Dicot	Laurales	Hernandiaceae	*Gyrocarpus americanus*	Native	LC

Dicot	Laurales	Hernandiaceae	*Hernandia nymphaeifolia*	Native	LC
Dicot	Icanicales	Icacinaceae	*Merrilliodendron megacarpum*	Native	NE
Dicot	Lamiales	Lamiaceae	*Coleus scutellarioides*	Native	NE
Dicot	Lamiales	Lamiaceae	*Volkameria inermis*	Native	NE
Dicot	Laurales	Lauraceae	*Endiandra aneityensis*	Endemic	NE
Dicot	Ericales	Lecythidaceae	*Barringtonia asiatica*	Native	LC
Dicot	Ericales	Lecythidaceae	*Barringtonia edulis*	Native	DD
Dicot	Ericales	Lecythidaceae	*Barringtonia racemosa*	Native	LC
Dicot	Malvales	Malvaceae	*Hibiscus tiliaceus*	Native	LC
Dicot	Malvales	Malvaceae	*Kleinhovia hospita*	Native	LC
Dicot	Malvales	Malvaceae	*Melochia odorata*	Native	LC
Dicot	Malvales	Malvaceae	*Sida rhombifolia*	Introduced	NE
Dicot	Malvales	Malvaceae	*Theobroma cacao*	Introduced	NE
Dicot	Malvales	Malvaceae	*Thespesia populnea*	Native	LC
Dicot	Malvales	Malvaceae	*Urena lobata*	Introduced	NE
Dicot	Zingiberales	Marantaceae	*Donax canniformis*	Native	NE
Dicot	Sapindales	Meliaceae	*Didymocheton alliaceus*	Native	NE
Dicot	Sapindales	Meliaceae	*Dysoxylum aneityense*	Endemic	NE
Dicot	Rosales	Moraceae	*Antiaris toxicaria*	Native	LC
Dicot	Rosales	Moraceae	*Ficus adenosperma*	Native	LC
Dicot	Rosales	Moraceae	*Ficus aspera*	Endemic	NT
Dicot	Rosales	Moraceae	*Ficus granatum*	Endemic	NT
Dicot	Rosales	Moraceae	*Ficus obliqua*	Native	LC
Dicot	Rosales	Moraceae	*Ficus tinctoria*	Native	LC
Dicot	Rosales	Moraceae	*Fic0.*	?	
Dicot	Rosales	Moraceae	*Ficus wassa*	Native	NE
Dicot	Apiales	Myodocarpaceae	*Delarbrea paradoxa*	Native	NE
Dicot	Magnoliales	Myristicaceae	*Myristica inutilis*	Native	LC
Dicot	Myrtales	Myrtaceae	*Syzygium malaccense*	Native	LC
Dicot	Myrtales	Myrtaceae	*Syzygium nomoa*	Endemic	NE
Dicot	Caryophyllales	Nyctaginaceae	*Pisonia aculeata*	Native	NE
Dicot	Malpighiales	Passifloraceae	*Passiflora foetida*	Introduced	NE
Dicot	Malpighiales	Passifloraceae	*Passiflora maliformis*	Introduced	NE
Dicot	Malpighiales	Phyllanthaceae	*Antidesma ghaesembilla (?sp.)*	Native	NE
Dicot	Malpighiales	Phyllanthaceae	*Bischofia javanica*	Native	LC
Dicot	Malpighiales	Phyllanthaceae	*Breynia disticha*	Native	NE
Dicot	Malpighiales	Phyllanthaceae	*Glochidion ramiflorum*	Native	LC
Dicot	Malpighiales	Phyllanthaceae	*Phyllanthus (Moeroris) amarus*	Introduced	NE
Dicot	Malpighiales	Phyllanthaceae	*Phyllanthus (Kirganelia) ciccoides*	Native	LC
Dicot	Piperales	Piperaceae	*(Macro)piper latifolium*	Native	NE
Dicot	Piperales	Piperaceae	*Piper macropiper*	Native	NE
Dicot	Piperales	Piperaceae	*Piper mestonii*	Introduced	NE
Dicot	Fabales	Polygalaceae	*Polygala paniculata*	Introduced	NE
Dicot	Fabales	Polypodiineae	*Drynaria rigidula*	Native	NE

Dicot	Ericales	Primulaceae	*Maesa sp(aneiteensis?)**	Endemic	NE
Dicot	Ericales	Primulaceae	*Maesa sp(aubertii?)**	Endemic	NE
Dicot	Ericales	Primulaceae	*Maesa sp(bennettii?)**	Endemic	NE
Dicot	Rosales	Rhamnaceae	*Alphitonia zizyphoides*	Native	LC
Dicot	Gentianales	Rubiaceae	*Dolicholobium aneityense*	Endemic	NE
Dicot	Gentianales	Rubiaceae	*Eumachia forsteriana*	Native	NE
Dicot	Gentianales	Rubiaceae	*Eumachia trichostoma*	Native	NE
Dicot	Gentianales	Rubiaceae	*Gardenia tannaensis*	Endemic	NE
Dicot	Gentianales	Rubiaceae	*Geophila repens (uniflora)*	Native	NE
Dicot	Gentianales	Rubiaceae	*Guettarda speciosa*	Native	LC
Dicot	Gentianales	Rubiaceae	*Ixora asme*	Endemic	NE
Dicot	Gentianales	Rubiaceae	*Ixora triflora*	Native	NE
Dicot	Gentianales	Rubiaceae	*Morinda citrifolia*	Native	NE
Dicot	Gentianales	Rubiaceae	*Mussaenda cylindrocarpa*	Native	NE
Dicot	Gentianales	Rubiaceae	*Neonauclea forsteri*	Native	NE
Dicot	Gentianales	Rubiaceae	*Pavetta opulina*	Native	NE
Dicot	Gentianales	Rubiaceae	*Psychotria milnei*	Native	NE
Dicot	Gentianales	Rubiaceae	*Psychotria nacdado*	Native	NE
Dicot	Gentianales	Rubiaceae	*Psychotria trichostoma*	Native	NE
Dicot	Gentianales	Rubiaceae	*Psychotria sp.*		
Dicot	Gentianales	Rubiaceae	*Psydrax odorata*	Native	NE
Dicot	Gentianales	Rubiaceae	*Rubiaceae*		
Dicot	Gentianales	Rubiaceae	*Spermacoce laevis*	Introduced	NE
Dicot	Gentianales	Rubiaceae	*Tarenna sambucina*	Native	LC
Dicot	Gentianales	Rubiaceae	*Tarenna*		
Dicot	Sapindales	Rutaceae	*Citrus × sinensis*	Introduced	NE
Dicot	Sapindales	Rutaceae	*Euodia hortensis*	Native	NE
Dicot	Sapindales	Rutaceae	*Melicope forbesii*	Native	NE
Dicot	Sapindales	Rutaceae	*Micromelum minutum*	Native	LC
Dicot	Sapindales	Rutaceae	*Murraya paniculata*	Native	NE
Dicot	Malpighiales	Salicaceae	*Casearia*		
Dicot	Sapindales	Sapindaceae	*Elattostachys apetala*	Native	LC
Dicot	Sapindales	Sapindaceae	*Harpullia arborea*	Native	NE
Dicot	Sapindales	Sapindaceae	*Pometia pinnata*	Native	LC
Dicot	Ericales	Sapotaceae	*Burckella obovata*	Native	LC
Dicot	Ericales	Sapotaceae	*Mimusops elengi*	Native	LC
Dicot	Ericales	Sapotaceae	*Planchonella chartacea*	Introduced	LC
Dicot	Sapindales	Simaroubaceae	*Quassia indica*	Native	NE
Dicot	Selaginellades	Selaginellaceae	*Selaginella distans*	Native	NE
Dicot	Solanales	Solanaceae	*Capsicum frutescens*	Introduced	NE
Dicot	Solanales	Solanaceae	*Physalis angulata*	Introduced	NE
Dicot	Solanales	Solanaceae	*Solanum lycopersicum*	Introduced	NE
Dicot	Solanales	Solanaceae	*Solanum nodiflorum (americanum)*	Introduced	NE
Dicot	Solanales	Solanaceae	*Solanum seaforthianum*	Introduced	NE

Dicot	Malvales	Thymelaeacaea	*Phaleria pentecostalis*	Endemic	NE
Dicot	Rosales	Urticaceae	*Boehmeria heterophylla*		
Dicot	Rosales	Urticaceae	*Boehmeria virgata*	Native	LC
Dicot	Rosales	Urticaceae	*Cypholophus sp.*		
Dicot	Rosales	Urticaceae	*Dendrocnide harveyi*	Native	NE
Dicot	Rosales	Urticaceae	*Dendrocnide latifolia*	Native	NE
Dicot	Rosales	Urticaceae	*Elatostema beccarii*	Native	NE
Dicot	Rosales	Urticaceae	*Elatostema macrophyllum*	Native	NE
Dicot	Rosales	Urticaceae	*Elatostema novae-britanniae*	Native	NE
Dicot	Rosales	Urticaceae	*Elatostema salomonense*	Native	NE
Dicot	Rosales	Urticaceae	*Laportea interrupta*	Native	NE
Dicot	Rosales	Urticaceae	*Leucosyke australis*	Native	LC
Dicot	Rosales	Urticaceae	*Leucosyke capitellata*	Native	LC
Dicot	Rosales	Urticaceae	*Leucosyke corymbulosa*	Native	NE
Dicot	Rosales	Urticaceae	*Nothocnide repanda*	Native	NE
Dicot	Rosales	Urticaceae	*Pipturus argenteus*	Native	LC
Dicot	Lamiales	Verbenaceae	*Phyla nodiflora*	Introduced	NE
Dicot	Lamiales	Vergenaceae	*Verbenaceae sp.*		
Dicot	Vitales	Vitaceae	*Cayratia (Causonis) trifolia*	Native	NE
Dicot	Vitales	Vitaceae	*Leea indica*	Native	LC
Dicot	Vitales	Vitaceae	*Tetrastigma vitiense*	Native	NE
Dicot	Zingiberales	Zingiberaceae	*Hedychium coronarium*	Introduced	NE
Mono cot	Arecales	Arecaceae	*Calamus vanuatuensis (vitiensis)*	Native	NE
Mono cot	Arecales	Arecaceae	*Cocos nucifera*	Native	NE
Mono cot	Arecales	Arecaceae	*Neoveitchia brunnea*	Endemic	CR
Mono cot	Asparagales	Asparagaceae	*Cordyline fruticosa*	Native	LC
Mono cot	Asparagales	Orchidaceae	*Corymborkis veratrifolia*	Native	NE
Mono cot	Asperagales	Orchidaceae	*Phreatia micrantha*	Native	NE
Mono cot	Dioscoreales	Dioscoreaceae	*Dioscorea bulbifera*	Native	NE
Mono cot	Liliales	Smilacaceae	*Smilax vitiensis*	Native	NE

Species marked with an * are described as ‘Individuals showing characteristics associated with the species named in parentheses. Confirmation of identification would be an essential first step prior to using these species for conservation purposes.

Table 6: Fern species found in the North Pentecost KBA.

Major Group	Family	Species	Endemic/Native /Introduced	IUCN Red List
Polypodiopsida	Aspleniaceae	*Asplenium aethiopicum*	Native	NE
Polypodiopsida	Aspleniaceae	*Asplenium amboinense*	Native	NE
Polypodiopsida	Aspleniaceae	*Asplenium sp(aneitense?)**	Endemic	NE
Polypodiopsida	Aspleniaceae	*Asplenium australasicum*	Native	NE
Polypodiopsida	Aspleniaceae	*Asplenium bipinnatifidum*	Native	NE
Polypodiopsida	Aspleniaceae	*Asplenium sp (brachycarpum?)**	Endemic	NE
Polypodiopsida	Aspleniaceae	*Asplenium carruthersii*	Native	NE
Polypodiopsida	Aspleniaceae	*Asplenium caudatum*	Native	NE
Polypodiopsida	Aspleniaceae	*Asplenium contiguum*	Native	NE
Polypodiopsida	Aspleniaceae	*Asplenium cuneatum*	Native	NE
Polypodiopsida	Aspleniaceae	*Asplenium sp (diplotion?)**	Native/ Endemic	NE
Polypodiopsida	Aspleniaceae	*Asplenium gibberosum*	Native	NE
Polypodiopsida	Aspleniaceae	*Asplenium horridum*	Native	NE
Polypodiopsida	Aspleniaceae	*Asplenium insiticium*	Native	NE
Polypodiopsida	Aspleniaceae	*Asplenium laserpitiifolium*	Native	NE
Polypodiopsida	Aspleniaceae	*Asplenium listeri*	Native	NE
Polypodiopsida	Aspleniaceae	*Asplenium marattioides*	Native	NE
Polypodiopsida	Aspleniaceae	*Asplenium nidus*	Native	NE
Polypodiopsida	Aspleniaceae	*Asplenium 50mprove5050*	Native	NE
Polypodiopsida	Aspleniaceae	*Asplenium subflexuosum*	Native	NE
Polypodiopsida	Athyriaceae	*Diplazium melanocaulon*	Native	NE
Polypodiopsida	Blechnaceae	*Austroblechnum melanocaulon*	Native	NE
Polypodiopsida	Blechnaceae	*Austroblechnum norfolkianum*	Native	NE
Polypodiopsida	Blechnaceae	*Austrogramme decipiens*	Native	NE
Polypodiopsida	Blechnaceae	*Blechnopsis orientalis*	Native	NE
Polypodiopsida	Cyatheaceae	*Alsophila alta*	Native	LC
Polypodiopsida	Cyatheaceae	*Alsophila aneitensis*	Native	NE
Polypodiopsida	Cyatheaceae	*Alsophila archboldii*	Native	LC
Polypodiopsida	Cyatheaceae	*Alsophila batjanensis*	Native	NE
Polypodiopsida	Cyatheaceae	*Alsophila vieillardii*	Native	NE
Polypodiopsida	Dryopteridaceae	*Arachniodes 50mprove50*	Native	NE

Polypodiopsida	Dryopteridaceae	*Bolbitis lonchophora*	Native	NE
Polypodiopsida	Dryopteridaceae	*Bolbitis quoyana*	Native	NE
Polypodiopsida	Dryopteridaceae	*Bolbitis rivularis*	Native?	NE
Polypodiopsida	Hymenophyllaceae	*Abrodictyum asae-grayi*	Native	NE
Polypodiopsida	Hymenophyllaceae	*Abrodictyum caudatum*	Native	NE
Polypodiopsida	Hymenophyllaceae	*Abrodictyum dentatum*	Native	NE
Polypodiopsida	Hymenophyllaceae	*Abrodictyum flavofuscum*	Native	NE
Polypodiopsida	Hymenophyllaceae	*Abrodictyum schlechteri*	Native	NE
Polypodiopsida	Hymenophyllaceae	*Callistopteris apiifolia*	Native	NE
Polypodiopsida	Marrattiaceae	*Angiopteris evecta*	Native	NE
Polypodiopsida	Psilotaceae	*Psilotum nudum*	Native	NE
Polypodiopsida	Pteridaceae	*Acrostichum aureum*	Native	NE
Polypodiopsida	Pteridaceae	*Acrostichum speciosum*	Native	NE
Polypodiopsida	Pteridaceae	*Adiantum aneitense*	Native	NE
Polypodiopsida	Pteridaceae	*Adiantum caudatum*	Native	NE
Polypodiopsida	Pteridaceae	*Adiantum ciliatum*	Native	NE
Polypodiopsida	Pteridaceae	*Adiantum diaphanum*	Native	NE
Polypodiopsida	Pteridaceae	*Adiantum hispidulum*	Native	NE
Polypodiopsida	Pteridaceae	*Adiantum philippense*	Native	NE
Polypodiopsida	Pteridaceae	*Adiantum tenerum*	Introduced	NE
Polypodiopsida	Pteridaceae	*Antrophyum callifolium*	Native	NE
Polypodiopsida	Pteridaceae	*Antrophyum plantagineum*	Native	NE
Polypodiopsida	Pteridaceae	*Antrophyum smithii*	Native	NE
Polypodiopsida	Pteridaceae	*Antrophyum subfalcatum*	Native	NE
Polypodiopsida	Tectariaceae	*Arthropteris palisotii*	Native	NE
Polypodiopsida	Thelypteridaceae	*Amblovenatum immersum*	Native?	NE
Polypodiopsida	Thelypteridaceae	*Christella dentata*	Native	NE

Species marked with an * are described as ‘Individuals showing characteristics associated with the species named in parentheses. Confirmation of identification would be an essential first step prior to using these species for conservation purposes.

Table 7: Plant species associated with Devil Palm – within 5 to 10 meters radius for all 6 sites.

Class	Order	Family	Scientific Name
Dicot	Plante	Salicaceae	*Homalium aneityense*
Monocot	Plante	Orchidaceae	*Phreatia micrantha*
Monocot	Plante	Smilacaceae	*Smilax vitiensis*
Dicot	Plante	Burseraceae	*Canarium indicum*
Dicot	Plante	Lauraceae	*Endiandra aneityensis*
Dicot	Plante	Moraceae	*Ficus tinctoria*
Dicot	Plante	Apocynaceae	*Cerbera odollam*
Dicot	Plante	Urticaceae	*Leucosyke*
Dicot	Plante	Ebenaceae	*Diospyros*
Dicot	Plante	Gesneriaceae	*Cyrtandra*
Dicot	Plante	Myodocarpaceae	*Delarbrea paradoxa subsp. Paradoxa*
Dicot	Plante	Fabaceae	*Schleinitzia insularum*
Dicot	Plante	Primulaceae	*Maesa sp(aubertii?)**
Dicot	Plante	Urticaceae	*Cypholophus*
Dicot	Plante	Euphorbiaceae	*Croton sp(levatii?)**
Dicot	Plante	Araliaceae	*Polyscias samoensis*
Dicot	Plante	Acanthaceae	*Pseuderanthemum carruthersii*
Dicot	Plante	Rubiaceae	*Eumachia trichostoma*
Dicot	Plante	Phyllanthaceae	*Phyllanthus ciccoides*
Dicot	Plante	Urticaceae	*Urticaceae*
Dicot	Plante	Thymelaeaceae	*Phaleria pentecostalis*
Dicot	Plante	Rubiaceae	*Spermacoce laevis*
Fern	Plante	Psilotaceae	*Psilotum nudum*
Dicot	Plante	Fabaceae	*Cynometra ramiflora*
Dicot	Plante	Phyllanthaceae	*Phyllanthus amarus*
Dicot	Plante	Aristolochiaceae	*Aristolochia vitiensis*
Monocot	Plante	Araceae	*Rhaphidophora*
Dicot	Plante	Apiaceae	*Centella asiatica*
Dicot	Plante	Polygalaceae	*Polygala paniculata*
Dicot	Plante	Euphorbiaceae	*Euphorbia hyssopifolia*
Dicot	Plante	Sapotaceae	*Planchonella chartacea*
Dicot	Plante	Fabaceae	*Sohmaea zonata*
Dicot	Plante	Asteraceae	*Blumea riparia*

2.4.7 CHECKLIST FOR ASSOCIATED PLANTS WITH DEVIL PALM BY SITES

The composition of plants associated with Devil Palm within the 5-10 meter radius was recorded. These plant species play a role to influence the growth of the palm' for instance shading of the palm, competition for nutrients and shade prevention, germination and growth of saplings, size of the trunk, height and fertility of the nuts. Many of the associated trees also attract rats and rodents that feed on mature nuts and affecting new growth and contributing to the variety of the species. This is an opportunity for collection of local names for plants however this was not collected by the team, something future assessments must consider to improve local knowledge of plants. The summary of the checklist by sites is as follow.

Table 8: Number of associated trees with Devil Palm.

Area/ Site	Number of Associated Plants
Lol Niuniu Tatu	121
Avat Galena	91
Lot Ureure	186
Atangai	191
Lol Bwibwi	248
Avwaririm	249

Figure 26: Shows the number of plant species associated with Devil Palm plots.

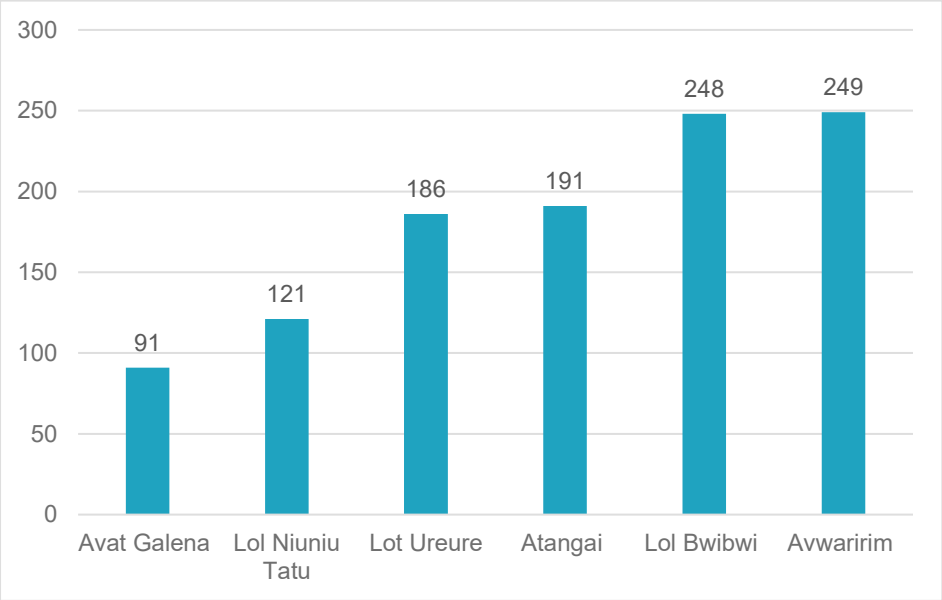


Table 9: Site 1 Lol Niuniu Tatu – inventory checklist.

Class	Family	Scientific Name	Common Name in Bislama (Vanuatu Pidgin)	Local Name in Hano Dialect of North Pentecost
Dicot	Acanthaceae	*Pseuderanthemum aubertii*	Borbora tri	Muramura ngalana
Dicot	Achariaceae	*Pangium edule*	Nabange	Vange
Dicot	Aizoaceae	*Sesuvium portulacastrum*		Gaototovuni
Dicot	Verbenaceae	*Verbenaceae*		
Dicot	Amaranthaceae	*Achyranthes aspera*		Haldeo
Dicot	Amaranthaceae	*Cyathula prostrata*		
Dicot	Amaranthaceae	*Deeringia arborescens*		
Dicot	Acanthaceae	*Iresine diffusa f. herbstii*		
Dicot	Anacardiaceae	*Dracontomelon vitiense*	Nakatambol	Gatabola
Dicot	Anacardiaceae	*Pleiogynium timoriense*	Red nakatambol	Gatabolu ganbwaratu
Dicot	Apocynaceae	*Vincetoxicum biglandulosum*		
Dicot	Araliaceae	*Polyscias multijuga*	Wael nalalas	Malbeibei
Dicot	Araliaceae	*Polyscias scutellaria*	Nalalas	Bei
Dicot	Araliaceae	*Polyscias cumingiana*	Nalalas	Bei
Dicot	Araliaceae	*Schefflera neoebudica*	Wael nalalas	

Dicot	Aristolochiaceae	*Aristolochia vitiensis*	Taktak flaoa	
Dicot	Asteraceae	*Mikania micrantha*	Feta sid	Gruadei
Dicot	Araliaceae	*Meryta neoebudica*	Eael nalalas	Bwabwalo
Dicot	Asteraceae	*Wollastonia biflora*	Wael san flaoa	Vwenue
Dicot	Bignoniaceae	*Dolichandrone spathacea*	Flaen fox tri	
Dicot	Boraginaceae	*Heliotropium foertherianum*	Bataflae tri	
Dicot	Boraginaceae	*Cordia dichotoma*	Glu tri	Vwaibulu
Dicot	Boraginaceae	*Cordia subcordata*	Trompet flaoa tri	Montanga
Dicot	Boraginaceae	*Heliotropium indicum*		
Dicot	Burseraceae	*Canarium indicum*	Nangai	Agai
Dicot	Burseraceae	*Garuga floribunda*	Namalaus	Malauhi
Dicot	Cannabaceae	*Celtis paniculata*		
Dicot	Cannabaceae	*Trema cannabina*	Krin pijin tri	Doudou
Dicot	Capparaceae	*Capparis spinosa*		
Dicot	Casuarinaceae	*Casuarina equisetifolia*	Oktri, Siok	Gairoro
Dicot	Convolvulaceae	*Ipomoea indica*	Wael kumala flaoa	
Dicot	Convolvulaceae	*Aniseia martinicensis*		
Dicot	Convolvulaceae	*Decalobanthus peltatus*	American rop, Big lif	
Dicot	Convolvulaceae	*Stictocardia tiliifolia*		
Dicot	Cornaceae	*Alangium vitiense*		
Dicot	Corynocarpaceae	*Corynocarpus similis*	Wael pea	
Dicot	Brassicaceae	*Rorippa sarmentosa*		
Dicot	Cucurbitaceae	*Diplocyclos palmatus*	Brewa	
Dicot	Cucurbitaceae	*Trichosanthes dieniensis*	Brewa	Taravwaravwa
Dicot	Dichapetalaceae	*Dichapetalum vitiense*		Gao bwatidumwi
Dicot	Dichapetalaceae	*Dichapetalaceae*		
Dicot	Dilleniaceae	*Dillenia biflora*		
Monocot	Dioscoreaceae	*Dioscorea bulbifera*	Wael potato	Bwevu
Dicot	Euphorbiaceae	*Acalypha forsteriana*	Naorpos	Garabihu
Dicot	Euphorbiaceae	*Acalypha grandis*	Naorpos	Garabihu
Dicot	Euphorbiaceae	*Aleurites moluccanus*	Oel nut tri	Wahewahe
Dicot	Euphorbiaceae	*Claoxylon sp (gillisonii?)**	Padel tri	Tavihevihe
Dicot	Euphorbiaceae	*Claoxylon psilogyne*	Padel tri	
Dicot	Euphorbiaceae	*Cleidion javanicum*	Tuinwan tri	
Fern	Thelypteridaceae	*Pronephrium*	Fen	
Monocot	Arecaceae	*Cocos nucifera*	Koconut	Niu
Dicot	Burseraceae	*Canarium indicum*	Nangai	Agai
Dicot	Euphorbiaceae	*Codiaeum variegatum*	Nasasa	Hahalinrevo
Dicot	Euphorbiaceae	*Croton sp(levatii?)**		Mamahao
Dicot	Euphorbiaceae	*Homalanthus nutans*	Klis wota	Halongi
Dicot	Euphorbiaceae	*Macaranga dioica*	Red navenue	Venue lei
Dicot	Euphorbiaceae	*Pimelodendron amboinicum*		
Dicot	Euphorbiaceae	*Macaranga tanarius*	Waet navenu	Venue boe
Dicot	Fabaceae	*Adenanthera pavonina*	Red bintri	Bisa
Dicot	Fabaceae	*Bauhinia variegata*	Hat liftri	
Dicot	Fabaceae	*Albizia lebbeck*	Bisa tri	
Dicot	Fabaceae	*Caesalpinia crista*	Ukrop	Gaotutuiga
Dicot	Fabaceae	*Cajanus cajan*	Waet bin	Bingai
Dicot	Fabaceae	*Senna obtusifolia*		

Dicot	Fabaceae	*Senna occidentalis*		
Dicot	Salicaceae	*Casearia*		
Dicot	Fabaceae	*Hanslia ormocarpoides*		
Dicot	Fabaceae	*Desmodium incanum*	Kolekole frut	Mera gan ova
Dicot	Fabaceae	*Dendrolobium umbellatum*		Huhugave
Dicot	Fabaceae	*Flemingia strobilifera*		
Dicot	Malvaceae	*Kleinhovia hospita*		
Dicot	Malvaceae	*Sida rhombifolia*	Brum kras	Ihara
Dicot	Malvaceae	*Melochia odorata*	Red namadal	Habwega memea
Dicot	Malvaceae	*Urena lobata*		Matemui
Dicot	Meliaceae	*Dysoxylum aneityense*	Red stinkwud	gatabola gan bwaratu
Dicot	Moraceae	*Ficus adenosperma*	Nabalango	Nunumwi
Dicot	Moraceae	*Ficus aspera*	Nabalango	Buliva
Dicot	Moraceae	*Ficus obliqua*	Nabanga	Revrevo
Dicot	Myrtaceae	*Syzygium malaccense*	Nakavika	Gaviga bwatimanu
Dicot	Myristicaceae	*Myristica inutilis*	Nandai	Ghaoaga
Dicot	Nyctaginaceae	*Pisonia aculeata*		
Dicot	Passifloraceae	*Passiflora maliformis*	Wael pasin frut	Gaogan garivi
Dicot	Passifloraceae	*Passiflora foetida*	Wael pasin frut	
Dicot	Phyllanthaceae	*Bischofia javanica*	Nakoka	Igoga
Dicot	Phyllanthaceae	*Antidesma ghaesembilla*		
Dicot	Phyllanthaceae	*Breynia disticha*		Dame vatu
Dicot	Phyllanthaceae	*Glochidion ramiflorum*	Wael namamao	Mwamwalau
Dicot	Phyllanthaceae	*Phyllanthus amarus*		Gaingal garivi
Dicot	Piperaceae	*Macropiper latifolium*	Wael kava	Bwagogo
Dicot	Piperaceae	*Piper macropiper*	Wael pepa	
Dicot	Piperaceae	*Piper mestonii*	Wael pepa	
Dicot	Primulaceae	*Maesa sp(bennettii?)**		Bwatidumi
Dicot	Primulaceae	*Maesa sp(aneiteensis?)**		
Dicot	Rubiaceae	*Dolicholobium aneityense*		
Dicot	Rubiaceae	*Gardenia tannaensis*	Tahiti tiare	Gaimwarara
Dicot	Rubiaceae	*Geophila repens*		Ram mauri aten niu
Dicot	Rubiaceae	*Ixora asme*		Virana memea kun gaviga Sara
Dicot	Rubiaceae	*Ixora triflora*		Tabwema
Dicot	Rubiaceae	*Morinda citrifolia*	Noni, yalo tree	Ghuresi
Dicot	Rubiaceae	*Mussaenda cylindrocarpa*	Flaoa lif	
Dicot	Rubiaceae	*Pavetta opulina*		Tabwema
Dicot	Rubiaceae	*Eumachia forsteriana*		
Dicot	Rubiaceae	*Psychotria milnei*		Sesebu
Dicot	Rubiaceae	*Eumachia trichostoma*		
Dicot	Rubiaceae	*Psychotria nacdado*		Sesbu
Fern	Lindsaeaceae	*Alsophila archboldii*	Blak pam	Bosia
Fern	Lomariopsidaceae	*Alsophila batjanensis*	Blak pam	Bosia
Fern	Lygodiaceae	*Alsophila vieillardii*	Blak pam	Bosia
Dicot	Urticaceae	*Dendrocnide harveyi*	Big nagalat	Ngalato
Dicot	Urticaceae	*Dendroncnide latifolia*	Smol nagalat	Ngalato
Fern	Marattiaceae	*Amblovenatum immersum*	Fen	
Fern	Nephrolepidaceae	*Angiopteris evecta*	Kabis fen	Sibwagoa
Fern	Oleandraceae	*Antrophyum callifolium*	Fen	

Fern	Ophioglossaceae	*Antrophyum plantagineum*	Fen	
Fern	Osmundaceae	*Antrophyum smithii*	Fen	
Fern	Polypodiaceae	*Antrophyum subfalcatum*	Fen	
Fern	Psilotaceae	*Arachniodes aristata*	Fen	
Fern	Pteridaceae	*Arthropteris palisotii*	Fen	
Fern	Saccolomataceae	*Asplenium aethiopicum*	Fen	
Fern	Schizaeaceae	*Asplenium amboinense*	Fen	
Fern	Tectariaceae	*Asplenium sp(aneitense?)**	Fen	
Fern	Thelypteridaceae	*Asplenium australasicum*	Fen	
Fern	Araliaceae	*Asplenium bipinnatifidum*	Fen	
Fern	Aspleniaceae	*Asplenium sp(brachycarpum?)**	Fen	Bwihibwihi gamali
Fern	Asteraceae	*Asplenium carruthersii*	Fen	
Fern	Athyriaceae	*Asplenium caudatum*	Fen	Galhaharia
Fern	Blechnaceae	*Asplenium contiguum*	Fen	
Fern	Cyatheaceae	*Asplenium cuneatum*	Fen	
Fern	Davalliaceae	*Asplenium sp (diplotion?)**	Fen	
Fern	Dennstaedtiaceae	*Asplenium gibberosum*	Fen	
Fern	Dicksoniaceae	*Asplenium horridum*	Fen	
Fern	Diplaziopsidaceae	*Asplenium insiticium*	Fen	
Fern	Dipteridaceae	*Asplenium laserpitiifolium*	Fen	
Fern	Dryopteridaceae	*Asplenium listeri*	Fen	
Fern	Equisetaceae	*Asplenium marattioides*	Fen	
Fern	Gleicheniaceae	*Asplenium nidus*	Bed blong pijin	Bugesi
Fern	Hymenophyllaceae	*Asplenium polyodon*	Fen	Lilibe hinge
Fern	Hypodematiaceae	*Asplenium subflexuosum*	Fen	
Fern	Lindsaeaceae	*Austroblechnum melanocaulon*	Fen	
Fern	Lomariopsidaceae	*Austroblechnum norfolkianum*	Fen	
Fern	Lygodiaceae	*Austrogramme decipiens*	Fen	
Fern	Marattiaceae	*Blechnopsis orientalis*	Fen	
Fern	Nephrolepidaceae	*Bolbitis lonchophora*	Fen	
Fern	Oleandraceae	*Bolbitis quoyana*	Fen	
Fern	Ophioglossaceae	*Bolbitis rivularis*	Fen	
Fern	Osmundaceae	*Callistopteris apiifolia*	Nalimlum fen	

Species marked with an * are described as ‘Individuals showing characteristics associated with the species named in parentheses. Confirmation of identification would be an essential first step prior to using these species for conservation purposes.

Table 10: Site 2 Avat Galanga – inventory checklist

Class	Family	Scientific Name	Common Name in Bislama (Vanuatu Pidgin)	Local Name in Hano Dialect of North Pentecost
Monocot	Orchidaceae	*Phreatia micrantha*	Bus flaoa, okid	
Monocot	Smilacaceae	*Smilax vitiensis*	Rope	Gao taitai
Dicot	Burseraceae	*Canarium indicum*	Nagai	Agai
Dicot	Lauraceae	*Endiandra aneityensis*		Giama
Dicot	Moraceae	*Ficus tinctoria*	Nabanga	Loa
Dicot	Apocynaceae	*Cerbera odollam*	Twin frut	Gahou
Dicot	Urticaceae	*Leucosyke capitellata*		Gauhi
Dicot	Gesneriaceae	*Cyrtandra sp*		Bwebwerua
Dicot	Myodocarpaceae	*Delarbrea paradoxa subsp. Paradoxa*	Wael nalalas	Didi
Dicot	Fabaceae	*Schleinitzia insularum*	Kasis	Lidelide
Dicot	Primulaceae	*Maesa sp(aubertii?)**		Bwati dumwi
Dicot	Urticaceae	*Cypholophus sp*		Aravoa meto
Dicot	Euphorbiaceae	*Croton sp(levatii?)**		Mamahao
Dicot	Araliaceae	*Polyscias samoensis*	Wael nalalas	Malbeibei
Dicot	Acanthaceae	*Pseuderanthemum carruthersii*	Borbora tri	Bubuha
Dicot	Rubiaceae	*Eumachia trichostoma*		
Dicot	Phyllanthaceae	*Phyllanthus ciccoides*		Dame
Dicot	Urticaceae	*Elatostema macrophyllum*		Aha aha
Dicot	Thymelaeaceae	*Phaleria pentecostalis*		Bulniu
Dicot	Rubiaceae	*Spermacoce laevis*		Ahea
Fern	Psilotaceae	*Psilotum nudum*		Fern wasi aten niu
Dicot	Fabaceae	*Cynometra ramiflora*		
Dicot	Phyllanthaceae	*Phyllanthus amarus*		Gaingal garivi
Dicot	Aristolochiaceae	*Aristolochia vitiensis*	Taktak flaoa	
Monocot	Araceae	*Rhaphidophora*	Rafia rop	Hal mangao
Dicot	Apiaceae	*Centella asiatica*	Leprosi rop	Aten niu
Dicot	Polygalaceae	*Polygala paniculata*	Viks grass	Garona
Dicot	Euphorbiaceae	*Euphorbia hyssopifolia*		
Dicot	Sapotaceae	*Planchonella chartacea*		Gai totovuhi
Dicot	Fabaceae	*Sohmaea zonata*		
Dicot	Asteraceae	*Blumea riparia*	Feta sid	
Dicot	Fabaceae	*Inocarpus fagiferus*	Namambe	
Dicot	Piperaceae	*Macropiper latifolium*	Wael kava	Bwagogo
Dicot	Acanthaceae	*hemigraphis alternata*		Bwabwaraeto
Dicot	Anacardiaceae	*Semicarpus Vitiansse*	Naulas	Walahi
Dicot	Araceae	*Epipremnum pinnatum*		Rauwalu
Dicot	Arecaceae	*Calamus vanuatuensis*	Ratan	Volae
Dicot	Asparagaceae	*Cordyline Fruticosa*	Nagaria	Ngaria
Dicot	Aspleniaceae	*Asplenium nidus*	Bed blong pijin	Bugesi
Dicot	Asteraceae	*Emilia sonchifolia*	Feta sid	Vivivii
Dicot	Athyriaceae	*Diplazium melanocaulon*	Kabis fen	Buhibuhi
Dicot	Boraginaceae	*Cordia dichotoma*	Glu tri	Vwaibulu
Dicot	Convolvulaceae	*merremia peltata*	American rop, Big lif	Tabwatabwa
Dicot	Fabaceae	*Pterocarpus indicus*	Bluwota	Nanara
Dicot	Malvaceae	*Hibiscus tiliaceus*	Burao	Bwatvae
Dicot	Marantaceae	*Donax canniformis*	crapting plant	Nene
Dicot	Moraceae	*Ficus Wassa*	Blak nabalango	Vovohe
Dicot	Myrtaceae	*Syzygium nomoa*	Wael nakavika	Vungaibena
Dicot	Phyllanthaceae	*Bischofia javanica*	Nakoka	Igoga
Dicot	Rhamnaceae	*Alphitonia zizyphoides*	Wasawasa	Dovae
Dicot	Rubiaceae	*Neonauclea forsteri*	Tamtam tri	Boga
Dicot	Selaginellaceae	*Selaginella distans*	Hea fen	Gogoromi
Dicot	Thelypteridaceae	*Christella dentata*	Fen	Bwirobwirogi
Dicot	Urticaceae	*Dendrocnide latifolia*	Smol nagalat	Ngalato
Dicot	Urticaceae.	*Nothocnide repanda*	Nadamai rop	Gao mwalabwelabwe
Dicot	Zingiberaceae	*Hedychium coronarium*	Wael ginja	Hinga
Dicot	Arecaceae	*Cocos Nucifera*	Coconut	Niu
Dicot	Lecythidaceae	*Barringtonia edulis*	Wael navel	Vele
Dicot	Fabaceae	*Calopogonium mucunoides*		Aga
Dicot	myristicaceae	*Myristica inutilis*	Nandai	Ghaoaga
Dicot	cyatheaceae	*Cyathea*	Blak pam	Bosia
Dicot	Myristicaceae	*Myristica inutilis*	Nandai	Ghaoaga
Dicot	solanaceae	*Solanum uporo*		Bima boro

Dicot	Polypodiineae	*Drynaria rigidula*	Fen	Bwatmaldiri
Dicot	Moraceae	*Ficus viren*	Nabalango	
Dicot	orchidaceae	*Corymborkis veratrifolia*	Bus flaoa, okid	Rarasatagu
Dicot	Fabaceae	*Pongamia*	Woman natora	Sileagi
Dicot	Meliaceae	*Didymocheton alliaceus (G. Forst.)*	Stink wud	
Dicot	Moraceae	*Ficus Cranatum*	Nabalango	Boaboa
Dicot	Euphorbiaceae	*Cleidion Brevipetiolatum*	Tuinwan tri	
Dicot	Rubiaceae	*Psychotria Milnei*		Sesbu
Dicot		*Maccaranga dioca*	Red navenu	Venue lei
Dicot	Apocynaceae	*Tabernaemontana pandacaqui*	Sling tri	Matgogona
Dicot	Cannabaceae	*Trema cannabinum*	Grin pijin tri	Doudou
Dicot	Nyctaginaceae	*Pisonia aculeata*		
Dicot	Passifloraceae	*Passiflora maliformis*	Wael pasin frut	Gao gan garivi
Dicot	Malvaceae	*Kleinhovia hospita*	Namatal	Habwega
Dicot	Malvaceae	*Sida rhombifolia*	Brum kras	Bwatihara
Dicot	Smilacaceae	*Smilax vitiensis*	Smilax vitiensis	Gao taitai
Fern	Araliaceae	*Asplenium bipinnatifidum*	Fen	
Fern	Aspleniaceae	*Asplenium sp(brachycarpum?)**	Fen	Bwihibwihi gamali
Fern	Asteraceae	*Asplenium carruthersii*	Fen	
Fern	Athyriaceae	*Asplenium caudatum*	Fen	Galhaharia
Fern	Blechnaceae	*Asplenium contiguum*	Fen	
Fern	Cyatheaceae	*Asplenium cuneatum*	Fen	
Fern	Davalliaceae	*Asplenium sp(diplotion?)**	Fen	
Fern	Dennstaedtiaceae	*Asplenium gibberosum*	Fen	
Fern	Dicksoniaceae	*Asplenium horridum*	Fen	
Fern	Diplaziopsidaceae	*Asplenium insiticium*	Fen	
Fern	Dipteridaceae	*Asplenium laserpitiifolium*	Fen	
Fern	Dryopteridaceae	*Asplenium listeri*	Fen	
Fern	Equisetaceae	*Asplenium marattioides*	Fen	
Fern	Gleicheniaceae	*Asplenium nidus*	Bed blong pijin	Bugesi
Fern	Hymenophyllaceae	*Asplenium polyodon*	Fen	Lilibe hinge
Fern	Hypodematiaceae	*Asplenium subflexuosum*	Fen	
Fern	Lindsaeaceae	*Austroblechnum melanocaulon*	Fen	
Fern	Lomariopsidaceae	*Austroblechnum norfolkianum*	Fen	
Fern	Lygodiaceae	*Austrogramme decipiens*	Fen	
Fern	Marattiaceae	*Blechnopsis orientalis*	Fen	
Fern	Nephrolepidaceae	*Bolbitis lonchophora*	Fen	
Fern	Oleandraceae	*Bolbitis quoyana*	Fen	
Fern	Ophioglossaceae	*Bolbitis rivularis*	Fen	
Fern	Osmundaceae	*Callistopteris apiifolia*	Nalimlum fen	

Species marked with an * are described as ‘Individuals showing characteristics associated with the species named in parentheses. Confirmation of identification would be an essential first step prior to using these species for conservation purposes.

Table 11: Site 3 Lol UreUre – inventory checklist.

Class	Family	Scientific name	Common name	Vernacular name
Dicot	Anacardiaceae	*Semecarpus vitiensis*	Naulas	Walahi
Dicot	Anacardiaceae	*Spondias dulcis*	Naus	Uhivatu
Dicot	Annonaceae	*Cananga odorata*	Nadigori	digori
Dicot	Apocynaceae	*Alyxia efatensis*		Bua
Dicot	Apocynaceae	*Hoya samoensis*	Melek rop	Gaoligo
Dicot	Apocynaceae	*Kopsia flavida*		
Dicot	Apocynaceae	*Tabernaemontana pandacaqui*	Slingtri	Matgogona
Dicot	Apocynaceae	*Vincetoxicum biglandulosum*		
Dicot	Araliaceae	*Polyscias multijuga*	Wael nalalas	Bei
Dicot	Araliaceae	*Polyscias scutellaria*	Nalalas	Bei
Dicot	Araliaceae	*Polyscias cumingiana*	Nalalas	Bei
Dicot	Asteraceae	*Mikania micrantha*	Fetasid	Gruadei
Dicot	Araliaceae	*Meryta neoebudica*	Wael nalalas	Bwabwalo
Dicot	Asteraceae	*Wollastonia biflora*	Wael sanflaoa	Vwenue
Dicot	Boraginaceae	*Cordia dichotoma*	Glutri	Vwaibulu
Dicot	Boraginaceae	*Heliotropium indicum*		
Dicot	Burseraceae	*Canarium indicum*	Nagai	Agai
Dicot	Burseraceae	*Garuga floribunda*	Namalaus	Malauhi
Dicot	Cannabaceae	*Celtis paniculata*		
Dicot	Cannabaceae	*Trema cannabinum*	Grin pijintri	Doudou
Dicot	Convolvulaceae	*Ipomoea pes-caprae*	Wael kumalaflaoa	
Dicot	Convolvulaceae	*Ipomoea quamoclit*	Oktri rop	
Dicot	Convolvulaceae	*Aniseia martinicensis*		Urutenbweta
Dicot	Convolvulaceae	*Decalobanthus peltatus*	American rop, Big lif rop	Tabwatabwa
Dicot	Convolvulaceae	*Stictocardia tiliifolia*	Big lif rop	
Dicot	Cornaceae	*Alangium vitiense*		Lol aranbuluki
Dicot	Corynocarpaceae	*Corynocarpus similis*	Waelpea	
Dicot	Brassicaceae	*Rorippa sarmentosa*		
Dicot	Cucurbitaceae	*Diplocyclos palmatus*	Brewa	
Dicot	Cucurbitaceae	*Trichosanthes dieniensis*	Brewa	Taravwaravwa
Dicot	Dichapetalaceae	*Dichapetalaceae timoriense*		
Dicot	Dilleniaceae	*Dillenia biflora*	Biglif tri	
Monocot	Dioscoreaceae	*Dioscorea bulbifera*	Wael potato	Bwevu
Dicot	Euphorbiaceae	*Acalypha caturus*	Naorpos	Garabihu
Dicot	Euphorbiaceae	*Acalypha grandis*	Naorpos	Garabihu
Dicot	Euphorbiaceae	*Aleurites moluccanus*	Oel nut tri	Wahewahe
Dicot	Euphorbiaceae	*Claoxylon psilogyne*	Padel tri	Tavihevihe
Fern	Thelypteridaceae	*Pronephrium*	Fen	Kum gasigasi lalavoa rauna nanava
Monocot	Arecaceae	*Cocos nucifera*	Coconut	Niu
Dicot	Euphorbiaceae	*Codiaeum variegatum*	Nasasa	Hahalinrevo
Dicot	Euphorbiaceae	*Croton sp(levatii?)**		Mamahao

Dicot	Euphorbiaceae	*Homalanthus nutans*	Kliswota	Halongi
Dicot	Euphorbiaceae	*Macaranga dioica*	Navenue	Venue
Dicot	Euphorbiaceae	*Pimelodendron amboinicum*		
Dicot	Euphorbiaceae	*Macaranga tanarius*	Waet navenu	Venue boe
Dicot	Fabaceae	*Adenanthera pavonina*	Red bintri	Bisa
Dicot	Fabaceae	*Bauhinia variegata*	Hat liftri	
Dicot	Fabaceae	*Albizia lebbeck*	Bisatri	Lidelide
Dicot	Fabaceae	*Caesalpinia crista*	Uk rop	Gaotutuiga
Dicot	Fabaceae	*Cajanus cajan*	Waet bin	Bingai
Dicot	Fabaceae	*Senna obtusifolia*		
Dicot	Fabaceae	*Senna occidentalis*		
Dicot	Salicaceae	*Casearia*		Gaikolo lol aran buluki
Dicot	Fabaceae	*Hanslia ormocarpoides*		
Dicot	Fabaceae	*Desmodium incanum*	Kolekole frut	Mera gan ova
Dicot	Fabaceae	*Dendrolobium umbellatum*		Huhugave
Dicot	Fabaceae	*Flemingia strobilifera*		
Dicot	Fabaceae	*Entada phaseoloides*	Snek rop	Gaovauru
Dicot	Fabaceae	*Indigofera zollingeriana*	Wael waetbin	
Dicot	Fabaceae	*Mimosa pudica*	Nil gras	Grass nail
Dicot	Fabaceae	*Pongamia pinnata*	Woman natora	Sileagi
Dicot	Fabaceae	*Pterocarpus indicus*	Bluwota	Nanara
Dicot	Fabaceae	*Pueraria montana var. lobata*	Disasta rop	Aga
Dicot	Fabaceae	*Inocarpus fagifer*	Namambe	Mwambwe
Dicot	Gesneriaceae	*Cyrtandra aneiteensis*		bwebwerua
Dicot	Hernandiaceae	*Gyrocarpus americanus*	Waetwud, Kenu tri	Ove
Dicot	Icacinaceae	*Merrilliodendron megacarpum*		
Dicot	Lamiaceae	*Coleus scutellarioides*		Hoanga
Dicot	Lamiaceae	*Volkameria inermis*		
Dicot	Lecythidaceae	*Barringtonia edulis*	Navel	Vele
Dicot	Malvaceae	*Kleinhovia hospita*	Namadal	Habwega
Dicot	Malvaceae	*Sida rhombifolia*	Brum kras	Ehara
Dicot	Malvaceae	*Melochia odorata*	Red namadal	Habwega maita
Dicot	Malvaceae	*Urena lobata*		Aranbuluki
Dicot	Meliaceae	*Dysoxylum aneityense*	Red stinkwud	Gatabola gan bwaratu
Dicot	Moraceae	*Antiaris toxicaria*	Melektri	Vaone
Dicot	Moraceae	*Ficus adenosperma*	Nabalango	Nunumwi
Dicot	Moraceae	*Ficus aspera*	Nabalango	buliva
Dicot	Moraceae	*Ficus obliqua*	Nabanga	Revrevo
Dicot	Myrtaceae	*Syzygium malaccense*	Nakavika	Kaviga
Dicot	Nyctaginaceae	*Pisonia aculeata*		
Dicot	Passifloraceae	*Passiflora maliformis*		
Dicot	Passifloraceae	*Passiflora foetida*	Wael pasinfrut	Gao gan garivi
Dicot	Phyllanthaceae	*Bischofia javanica*	Nakoka	Igoga
Dicot	Phyllanthaceae	*Antidesma ghaesembilla*		

Dicot	Phyllanthaceae	*Breynia disticha*		Dame
Dicot	Phyllanthaceae	*Glochidion ramiflorum*	Wwael namamao	Mwamwalau
Dicot	Phyllanthaceae	*Phyllanthus amarus*		Gaingal garivi
Dicot	Piperaceae	*Macropiper latifolium*	Wael kava	Bwagogo
Dicot	Piperaceae	*Piper macropiper*	Wael pepa	
Dicot	Piperaceae	*Piper mestonii*	Wael pepa	
Dicot	Primulaceae	*Maesa sp(bennettii?)**		Bwatidumi
Dicot	Rubiaceae	*Dolicholobium aneityense*		
Dicot	Rubiaceae	*Gardenia tannaensis*		Gaimwarara
Dicot	Rubiaceae	*Geophila repens*		Ram mauri aten niu
Dicot	Rubiaceae	*Ixora asme*		
Dicot	Rubiaceae	*Ixora triflora*		Tabwema
Dicot	Rubiaceae	*Morinda citrifolia*	Noni yalo tri	Ghuresi
Dicot	Rubiaceae	*Pavetta opulina*		
Dicot	Rubiaceae	*Eumachia forsteriana*		
Dicot	Rubiaceae	*Psychotria milnei*		
Dicot	Rubiaceae	*Eumachia trichostoma*		
Dicot	Rubiaceae	*Psychotria trichotoma*		Sesbu
Dicot	Rubiaceae	*Psydrax odorata*		Ara manu
Dicot	Rubiaceae	*Tarenna sambucina*		
Dicot	Rutaceae	*Citrus × sinensis*	Aranis	
Dicot	Rutaceae	*Euodia hortensis*		Bwangi
Dicot	Rutaceae	*Melicope forbesii*		
Dicot	Rutaceae	*Micromelum minutum*	Snek tri	Gaiavu langu
Dicot	Rutaceae	*Murraya paniculata*	Natsama nel	Karasol
Dicot	Sapindaceae	*Elattostachys apetala*		
Dicot	Sapindaceae	*Pometia pinnata*	Nandao	Dao
Monocot	Smilacaceae	*Smilax vitiensis*		
Dicot	Solanaceae	*Solanum seaforthianum*	Mabor	
Dicot	Solanaceae	*Solanum nodiflorum*	Mabor	Ganlivusmalava
Dicot	Solanaceae	*Physalis angulata*	dingi lif	Dingrae
Dicot	Solanaceae	*Solanum lycopersicum*	Tomato	Tomato
Dicot	Solanaceae	*Capsicum frutescens*	Pima	bima ganmanu
Dicot	Urticaceae	*Boehmeria platyphylla*	Aravoa	
Dicot	Urticaceae	*Dendrocnide harveyi*	Big nagalat	Galato
Dicot	Urticaceae	*Dendrocnide latifolia*	Smol nagalat	Galato
Dicot	Urticaceae	*Elatostema beccarii*		Bwatmamaragai
Dicot	Urticaceae	*Elatostema macrophyllum*		Aha aha
Dicot	Urticaceae	*Elatostema novae-britanniae*		Bwatmamaragai
Dicot	Urticaceae	*Elatostema salomonense*		Bwatmamaragai
Dicot	Urticaceae	*Laportea interrupta*		
Dicot	Urticaceae	*Leucosyke australis*		Gauhi
Dicot	Urticaceae	*Leucosyke corymbulosa*		Arimwaduru
Dicot	Urticaceae	*Nothocnide repanda*	Nadamai rop	Gao mwalabwelabwe

Dicot	Urticaceae	*Pipturus argenteus*	Nadamai	Adomwae
Dicot	Verbenaceae	*Phyla nodiflora*		
Dicot	Vitaceae	*Leea indica*		Galivanboe
Dicot	Vitaceae	*Cayratia trifolia*	Wael waen rop	Maratangtangi
Monocot	Marantaceae	*Donax canniformis*	Crapting plant	Nene
Dicot	Myristicaceae	*Myristica inutilis*	Nandai	Gaowaga
Monocot	Arecaceae	*Veitchia sp*	Palm	Niuniu

Species marked with an * are described as 'Individuals showing characteristics associated with the species named in parentheses. Confirmation of identification would be an essential first step prior to using these species for conservation purposes.

Table 12: Site 4 Atangai - inventory checklist

Major Group	Family	Scientific name	Common name in Bislama (Vanuatu pidgin)	Local name in Hano dialect of North Pentecost
Fern	Araliaceae	*Abrodictyum asae-grayi*	Nalumlum fen	
Fern	Aspleniaceae	*Abrodictyum caudatum*	Nalumlum fen	
Fern	Asteraceae	*Abrodictyum dentatum*	Nalumlum fen	
Fern	Athyriaceae	*Abrodictyum flavofuscum*	Nalumlum fen	
Fern	Blechnaceae	*Abrodictyum schlechteri*	Nalumlum fen	
Fern	Cyatheaceae	*Acrostichum aureum*	Nalumlum fen	
Fern	Davalliaceae	*Acrostichum speciosum*	Fen	Red bwibwina spos
Fern	Dennstaedtiaceae	*Adiantum aneitense*	Fen	
Fern	Dicksoniaceae	*Adiantum caudatum*	Fen	
Fern	Diplaziopsidaceae	*Adiantum ciliatum*	Fen	
Fern	Dipteridaceae	*Adiantum diaphanum*	Fen	
Fern	Dryopteridaceae	*Adiantum hispidulum*	Fen	
Fern	Equisetaceae	*Adiantum philippense*	Fen	
Fern	Gleicheniaceae	*Adiantum tenerum*	Fen	
Fern	Hymenophyllaceae	*Alsophila alta*	Blak pam	Bosia
Fern	Hypodematiaceae	*Alsophila aneitensis*	Blak pam	Bosia
Fern	Lindsaeaceae	*Alsophila archboldii*	Blak pam	Bosia
Fern	Lomariopsidaceae	*Alsophila batjanensis*	Blak pam	Bosia
Fern	Lygodiaceae	*Alsophila vieillardii*	Blak pam	Bosia
Dicot	Urticaceae	*Dendrocnide harveyi*	Big nagalat	Ngalato
Dicot	Urticaceae	*Dendroncnide latifolia*	Smol nagalat	Ngalato
Fern	Marattiaceae	*Amblovenatum immersum*	Fen	
Fern	Nephrolepidaceae	*Angiopteris evecta*	Kabis fen	Sibwagoa
Fern	Oleandraceae	*Antrophyum callifolium*	Fen	
Fern	Ophioglossaceae	*Antrophyum plantagineum*	Fen	
Fern	Osmundaceae	*Antrophyum smithii*	Fen	
Fern	Polypodiaceae	*Antrophyum subfalcatum*	Fen	
Fern	Psilotaceae	*Arachniodes aristata*	Fen	
Fern	Pteridaceae	*Arthropteris palisotii*	Fen	
Fern	Saccolomataceae	*Asplenium aethiopicum*	Fen	
Fern	Schizaeaceae	*Asplenium amboinense*	Fen	
Fern	Tectariaceae	*Asplenium sp(aneitense?)**	Fen	
Fern	Thelypteridaceae	*Asplenium australasicum*	Fen	
Fern	Araliaceae	*Asplenium bipinnatifidum*	Fen	
Fern	Aspleniaceae	*Asplenium sp(brachycarpum?)**	Fen	Bwihibwihi gamali
Fern	Asteraceae	*Asplenium carruthersii*	Fen	
Fern	Athyriaceae	*Asplenium caudatum*	Fen	Galhaharia
Fern	Blechnaceae	*Asplenium contiguum*	Fen	
Fern	Cyatheaceae	*Asplenium cuneatum*	Fen	
Fern	Davalliaceae	*Asplenium sp(diplotion?)**	Fen	
Fern	Dennstaedtiaceae	*Asplenium gibberosum*	Fen	
Fern	Dicksoniaceae	*Asplenium horridum*	Fen	
Fern	Diplaziopsidaceae	*Asplenium insiticium*	Fen	
Fern	Dipteridaceae	*Asplenium laserpitiifolium*	Fen	
Fern	Dryopteridaceae	*Asplenium listeri*	Fen	
Fern	Equisetaceae	*Asplenium marattioides*	Fen	

Fern	Gleicheniaceae	*Asplenium nidus*	Bed blong pijin	Bugesi
Fern	Hymenophyllaceae	*Asplenium polyodon*	Fen	Lilibe hinge
Fern	Hypodematiaceae	*Asplenium subflexuosum*	Fen	
Fern	Lindsaeaceae	*Austroblechnum melanocaulon*	Fen	
Fern	Lomariopsidaceae	*Austroblechnum norfolkianum*	Fen	
Fern	Lygodiaceae	*Austrogramme decipiens*	Fen	
Fern	Marattiaceae	*Blechnopsis orientalis*	Fen	
Fern	Nephrolepidaceae	*Bolbitis lonchophora*	Fen	
Fern	Oleandraceae	*Bolbitis quoyana*	Fen	
Fern	Ophioglossaceae	*Bolbitis rivularis*	Fen	
Fern	Osmundaceae	*Callistopteris apiifolia*	Nalimlum fen	
Dicot	Anacardiaceae	*Semecarpus vitiensis*	Naulas	Walahi
Dicot	Anacardiaceae	*Spondias dulcis*	naus	Uhi vatu
Dicot	Annonaceae	*Cananga odorata*	Nadigori	Digori
Dicot	Apocynaceae	*Alyxia efatensis*		Bua
Dicot	Apocynaceae	*Hoya samoensis*	Melek rop	Gao ligo
Dicot	Apocynaceae	*Kopsia flavida*		
Dicot	Apocynaceae	*Tabernaemontana pandacaqui*	Sling tri	Matgogona
Dicot	Apocynaceae	*Vincetoxicum biglandulosum*		
Dicot	Araliaceae	*Polyscias multijuga*	Wael nalalas	Bei
Dicot	Araliaceae	*Polyscias scutellaria*	Nalalas	Bei
Dicot	Araliaceae	*Polyscias cumingiana*	Nalalas	Bei
Dicot	Asteraceae	*Mikania micrantha*	Feta sid	gruadei
Dicot	Araliaceae	*Meryta neoebudica*	Wael nalalas	bwabwalo
Dicot	Asteraceae	*Wollastonia biflora*	Wael san flaoa	Vwenue
Dicot	Boraginaceae	*Cordia dichotoma*	Glu tri	Vwaibulu
Dicot	Boraginaceae	*Heliotropium indicum*		
Dicot	Burseraceae	*Canarium indicum*	Nagai	Agai
Dicot	Burseraceae	*Garuga floribunda*	Namalaus	Malauhi
Dicot	Cannabaceae	*Celtis paniculata*		
Dicot	Cannabaceae	*Trema cannabinum*	Grin pijin tri	Doudou
Dicot	Convolvulaceae	*Ipomoea pes-caprae*	Wael kumala flaoa	
Dicot	Convolvulaceae	*Ipomoea quamoclit*	Oktri rop	
Dicot	Convolvulaceae	*Aniseia martinicensis*		Urutenbweta
Dicot	Convolvulaceae	*Decalobanthus peltatus*	American rop, Big lif	Tabwatabwa
Dicot	Convolvulaceae	*Stictocardia tiliifolia*	Biglif rop	
Dicot	Cornaceae	*Alangium vitiense*		Lol aranbuluki
Dicot	Corynocarpaceae	*Corynocarpus similis*	Wael pea	
Dicot	Brassicaceae	*Rorippa sarmentosa*		
Dicot	Cucurbitaceae	*Diplocyclos palmatus*	Brewa	
Dicot	Cucurbitaceae	*Trichosanthes dieniensis*	Brewa	Taravwaravwa
Dicot	Dichapetalaceae	*Dichapetalaceae timoriense*		
Dicot	Dilleniaceae	*Dillenia biflora*	Big lif tri	
Monocot	Dioscoreaceae	*Dioscorea bulbifera*	Wael potato	Bwevu
Dicot	Euphorbiaceae	*Acalypha caturus*	Naorpos	Garabihu
Dicot	Euphorbiaceae	*Acalypha grandis*	Naorpos	Garabihu
Dicot	Euphorbiaceae	*Aleurites moluccanus*	Oel nut tri	Wahewahe

Dicot	Euphorbiaceae	*Claoxylon psilogyne*	Padel tri	Tavihevihe
Fern	Thelypteridaceae	*Pronephrium*	Fen	Kum gasigasi lalavoa rauna nanava
Monocot	Arecaceae	*Cocos nucifera*	Coconut	Niu
Dicot	Euphorbiaceae	*Codiaeum variegatum*	Nasasa	Hahalinrevo
Dicot	Euphorbiaceae	*Croton sp(levatii?)**		Mamahao
Dicot	Euphorbiaceae	*Homalanthus nutans*	Klis wota	Halongi
Dicot	Euphorbiaceae	*Macaranga dioica*	Navenue	Venue
Dicot	Euphorbiaceae	*Pimelodendron amboinicum*		
Dicot	Euphorbiaceae	*Macaranga tanarius*	Waet navenu	Venue boe
Dicot	Fabaceae	*Adenanthera pavonina*	Red bintri	Bisa
Dicot	Fabaceae	*Bauhinia variegata*	Hat lif tri	
Dicot	Fabaceae	*Albizia lebbeck*	Bisa tri	Lidelide
Dicot	Fabaceae	*Caesalpinia crista*	Uk rop	Gaotutuiga
Dicot	Fabaceae	*Cajanus cajan*	Waet bin	Bingai
Dicot	Fabaceae	*Senna obtusifolia*		
Dicot	Fabaceae	*Senna occidentalis*		
Dicot	Salicaceae	*Casearia*		Gaikolo lol aran buluki
Dicot	Fabaceae	*Hanslia ormocarpoides*		
Dicot	Fabaceae	*Desmodium incanum*	Kolekole frut	Mera ganova
Dicot	Fabaceae	*Dendrolobium umbellatum*		Huhugave
Dicot	Fabaceae	*Flemingia strobilifera*		
Dicot	Fabaceae	*Entada phaseoloides*	Snek rop	Gaovauru
Dicot	Fabaceae	*Indigofera zollingeriana*	Wael waetbin	
Dicot	Fabaceae	*Mimosa pudica*	Nil gras	Grass nail
Dicot	Fabaceae	*Pongamia pinnata*	Woman natora	Sileagi
Dicot	Fabaceae	*Pterocarpus indicus*	Bluwota	Nanara
Dicot	Fabaceae	*Pueraria montana var. lobata*	Disasta rop	Aga
Dicot	Fabaceae	*Inocarpus fagifer*	Namambe	Mwambwe
Dicot	Gesneriaceae	*Cyrtandra aneiteensis*		Bwebwerua
Dicot	Hernandiaceae	*Gyrocarpus americanus*	Waetwud, Kenu tri	Ove
Dicot	Icacinaceae	*Merrilliodendron megacarpum*		
Dicot	Lamiaceae	*Coleus scutellarioides*		Hoanga
Dicot	Lamiaceae	*Volkameria inermis*		
Dicot	Lecythidaceae	*Barringtonia edulis*	Navel	Vele
Dicot	Malvaceae	*Kleinhovia hospita*	Namatal	Habwega
Dicot	Malvaceae	*Sida rhombifolia*	Brum kras	Ehara
Dicot	Malvaceae	*Melochia odorata*	Red namatal	Habwega maita
Dicot	Malvaceae	*Urena lobata*		Aranbuluki
Dicot	Meliaceae	*Dysoxylum aneityense*	Red stinkwud	Gatabola gan bwaratu
Dicot	Moraceae	*Antiaris toxicaria*	Melek tri	Vaone
Dicot	Moraceae	*Ficus adenosperma*	Nabalango	Nunumwi
Dicot	Moraceae	*Ficus aspera*	Nabalango	Buliva
Dicot	Moraceae	*Ficus obliqua*	Nabanga	Revrevo

Dicot	Myrtaceae	*Syzygium malaccense*	Nakavika	Gaviga
Dicot	Nyctaginaceae	*Pisonia aculeata*		
Dicot	Passifloraceae	*Passiflora maliformis*		
Dicot	Passifloraceae	*Passiflora foetida*	Wael pasin frut	Gao gan garivi
Dicot	Phyllanthaceae	*Bischofia javanica*	Nakoka	Igoga
Dicot	Phyllanthaceae	*Antidesma ghaesembilla*		
Dicot	Phyllanthaceae	*Breynia disticha*		Dame
Dicot	Phyllanthaceae	*Glochidion ramiflorum*	Wael namamao	Mwamwalau
Dicot	Phyllanthaceae	*Phyllanthus amarus*		Gaingal garivi
Dicot	Piperaceae	*Macropiper latifolium*	Wael kava	Bwagogo
Dicot	Piperaceae	*Piper macropiper*	Wael pepa	
Dicot	Piperaceae	*Piper mestonii*	wael pepa	
Dicot	Primulaceae	*Maesa sp(bennettii?)**		Bwatidumi
Dicot	Rubiaceae	*Dolicholobium aneityense*		
Dicot	Rubiaceae	*Gardenia tannaensis*		Gaimwarara
Dicot	Rubiaceae	*Geophila repens*		Ram mauri aten niu
Dicot	Rubiaceae	*Ixora asme*		
Dicot	Rubiaceae	*Ixora triflora*		Tabwema
Dicot	Rubiaceae	*Morinda citrifolia*	Noni or Yalotri	Ghuresi
Dicot	Rubiaceae	*Pavetta opulina*		
Dicot	Rubiaceae	*Eumachia forsteriana*		
Dicot	Rubiaceae	*Psychotria milnei*		
Dicot	Rubiaceae	*Eumachia trichostoma*		
Dicot	Rubiaceae	*Psychotria trichotoma*		Sesbu
Dicot	Rubiaceae	*Psydrax odorata*		ara manu
Dicot	Rubiaceae	*Tarenna sambucina*		
Dicot	Rutaceae	*Citrus × sinensis*	Aranis	
Dicot	Rutaceae	*Euodia hortensis*		Bwangi
Dicot	Rutaceae	*Melicope forbesii*		
Dicot	Rutaceae	*Micromelum minutum*	Snektri	Gaiavu langu
Dicot	Rutaceae	*Murraya paniculata*	Natsama nel	Karasol
Dicot	Sapindaceae	*Elattostachys apetala*		
Dicot	Sapindaceae	*Pometia pinnata*	Nandao	Dao
Monocot	Smilacaceae	*Smilax vitiensis*		
Dicot	Solanaceae	*Solanum seaforthianum*	Mabor	
Dicot	Solanaceae	*Solanum nodiflorum*	Mabor	Ganlivusmalava
Dicot	Solanaceae	*Physalis angulata*	Dingi lif	Dingrae
Dicot	Solanaceae	*Solanum lycopersicum*	Tomato	Tomato
Dicot	Solanaceae	*Capsicum frutescens*	Pima	Bima ganmanu
Dicot	Urticaceae	*Boehmeria platyphylla*	Aravoa	
Dicot	Urticaceae	*Dendrocnide harveyi*	Big nagalat	Galato
Dicot	Urticaceae	*Dendrocnide latifolia*	Smol nagalat	Galato
Dicot	Urticaceae	*Elatostema beccarii*		Bwatmamaragai
Dicot	Urticaceae	*Elatostema macrophyllum*		Aha aha

Dicot	Urticaceae	*Elatostema novae-britanniae*		Bwatmamaragai
Dicot	Urticaceae	*Elatostema salomonense*		Bwatmamaragai
Dicot	Urticaceae	*Laportea interrupta*		
Dicot	Urticaceae	*Leucosyke australis*		Gauhi
Dicot	Urticaceae	*Leucosyke corymbulosa*		Arimwaduru
Dicot	Urticaceae	*Nothocnide repanda*	Nadamai rop	Gao mwalabwelabwe
Dicot	Urticaceae	*Pipturus argenteus*	Nadamai	Adomwae
Dicot	Verbenaceae	*Phyla nodiflora*		
Dicot	Vitaceae	*Leea indica*		Galivanboe
Dicot	Vitaceae	*Cayratia trifolia*	Wael waen rop	Maratangtangi
Monocot	Marantaceae	*Donax canniformis*	Crapting plant	Nene
Dicot	Myristicaceae	*Myristica inutilis*	Nandai	Gaowaga
Monocot	Arecaceae	*Veitchia sp*	Palm	Niuniu
Dicot	Euphorbiaceae	*Endospermum medullosum*	Waetwud	Gaimaita

Species marked with an * are described as 'Individuals showing characteristics associated with the species named in parentheses. Confirmation of identification would be an essential first step prior to using these species for conservation purposes.

Table 13: Site 5 Lol Bwibwi - inventory checklist

Major Group	Family	Scientific name	Common name in Bislama (Vanuatu pidgin)	Local name in Hano dialect of North Pentecost
Fern	Araliaceae	*Abrodictyum asae-grayi*	Nalumlum fen	
Fern	Aspleniaceae	*Abrodictyum caudatum*	Nalumlum fen	
Fern	Asteraceae	*Abrodictyum dentatum*	Nalumlum fen	
Fern	Athyriaceae	*Abrodictyum flavofuscum*	Nalumlum fen	
Fern	Blechnaceae	*Abrodictyum schlechteri*	Nalumlum fen	
Fern	Cyatheaceae	*Acrostichum aureum*	Nalumlum fen	
Fern	Davalliaceae	*Acrostichum speciosum*	Fen	Red bwibwina spos
Fern	Dennstaedtiaceae	*Adiantum aneitense*	Fen	
Fern	Dicksoniaceae	*Adiantum caudatum*	Fen	
Fern	Diplaziopsidaceae	*Adiantum ciliatum*	Fen	
Fern	Dipteridaceae	*Adiantum diaphanum*	Fen	
Fern	Dryopteridaceae	*Adiantum hispidulum*	Fen	
Fern	Equisetaceae	*Adiantum philippense*	Fen	
Fern	Gleicheniaceae	*Adiantum tenerum*	Fen	
Fern	Hymenophyllaceae	*Alsophila alta*	Blak pam	Bosia
Fern	Hypodematiaceae	*Alsophila aneitensis*	Blak pam	Bosia
Fern	Lindsaeaceae	*Alsophila archboldii*	Blak pam	Bosia
Fern	Lomariopsidaceae	*Alsophila batjanensis*	Blak pam	Bosia
Fern	Lygodiaceae	*Alsophila vieillardii*	Blak pam	Bosia
Dicot	Urticaceae	*Dendrocnide harveyi*	Big nagalat	Ngalato
Dicot	Urticaceae	*Dendroncnide latifolia*	Smol nagalat	Ngalato
Fern	Marattiaceae	*Amblovenatum immersum*	Fen	
Fern	Nephrolepidaceae	*Angiopteris evecta*	Kabis fen	Sibwagoa
Fern	Oleandraceae	*Antrophyum callifolium*	Fen	

Fern	Ophioglossaceae	*Antrophyum plantagineum*	Fen	
Fern	Osmundaceae	*Antrophyum smithii*	Fen	
Fern	Polypodiaceae	*Antrophyum subfalcatum*	Fen	
Fern	Psilotaceae	*Arachniodes aristata*	Fen	
Fern	Pteridaceae	*Arthropteris palisotii*	Fen	
Fern	Saccolomataceae	*Asplenium aethiopicum*	Fen	
Fern	Schizaeaceae	*Asplenium amboinense*	Fen	
Fern	Tectariaceae	*Asplenium sp(aneitense?)**	Fen	
Fern	Thelypteridaceae	*Asplenium australasicum*	Fen	
Fern	Araliaceae	*Asplenium bipinnatifidum*	Fen	
Fern	Aspleniaceae	*Asplenium sp(brachycarpum?)**	Fen	Bwihibwihi gamali
Fern	Asteraceae	*Asplenium carruthersii*	Fen	
Fern	Athyriaceae	*Asplenium caudatum*	Fen	Galhaharia
Fern	Blechnaceae	*Asplenium contiguum*	Fen	
Fern	Cyatheaceae	*Asplenium cuneatum*	Fen	
Fern	Davalliaceae	*Asplenium sp(diplotion?)**	Fen	
Fern	Dennstaedtiaceae	*Asplenium gibberosum*	Fen	
Fern	Dicksoniaceae	*Asplenium horridum*	Fen	
Fern	Diplaziopsidaceae	*Asplenium insiticium*	Fen	
Fern	Dipteridaceae	*Asplenium laserpitiifolium*	Fen	
Fern	Dryopteridaceae	*Asplenium listeri*	Fen	
Fern	Equisetaceae	*Asplenium marattioides*	Fen	
Fern	Gleicheniaceae	*Asplenium nidus*	Bed blong pijin	Bugesi
Fern	Hymenophyllaceae	*Asplenium polyodon*	Fen	Lilibe hinge
Fern	Hypodematiaceae	*Asplenium subflexuosum*	Fen	
Fern	Lindsaeaceae	*Austroblechnum melanocaulon*	Fen	
Fern	Lomariopsidaceae	*Austroblechnum norfolkianum*	Fen	
Fern	Lygodiaceae	*Austrogramme decipiens*	Fen	
Fern	Marattiaceae	*Blechnopsis orientalis*	Fen	
Fern	Nephrolepidaceae	*Bolbitis lonchophora*	Fen	
Fern	Oleandraceae	*Bolbitis quoyana*	Fen	
Fern	Ophioglossaceae	*Bolbitis rivularis*	Fen	
Fern	Osmundaceae	*Callistopteris apiifolia*	Nalimlum fen	
Dicot	Anacardiaceae	*Semecarpus vitiensis*	Naulas	Walahi
Dicot	Anacardiaceae	*Spondias dulcis*	Naus	Uhi vatu
Dicot	Annonaceae	*Cananga odorata*	Nadigori	Digori
Dicot	Apocynaceae	*Alyxia efatensis*		Bua
Dicot	Apocynaceae	*Hoya samoensis*	Melek rop	Gao ligo
Dicot	Apocynaceae	*Kopsia flavida*		
Dicot	Apocynaceae	*Tabernaemontana pandacaqui*	Sling tri	Matgogona
Dicot	Apocynaceae	*Vincetoxicum biglandulosum*		
Dicot	Araliaceae	*Polyscias multijuga*	Wael nalalas	Bei
Dicot	Araliaceae	*Polyscias scutellaria*	Nalalas	Bei
Dicot	Araliaceae	*Polyscias cumingiana*	Nalalas	Bei
Dicot	Asteraceae	*Mikania micrantha*	Feta sid	Gruadei
Dicot	Araliaceae	*Meryta neoebudica*	Wael nalalas	Bwabwalo
Dicot	Asteraceae	*Wollastonia biflora*	Wael san flaoa	Vwenue
Dicot	Boraginaceae	*Cordia dichotoma*	Glu tri	Vwaibulu
Dicot	Boraginaceae	*Heliotropium indicum*		

Dicot	Burseraceae	*Canarium indicum*	Nagai	Agai
Dicot	Burseraceae	*Garuga floribunda*	Namalaus	Malauhi
Dicot	Cannabaceae	*Celtis paniculata*		
Dicot	Cannabaceae	*Trema cannabinum*	Grin pijin tri	Doudou
Dicot	Convolvulaceae	*Ipomoea pes-caprae*	Wael kumala flaoa	
Dicot	Convolvulaceae	*Ipomoea quamoclit*	oktri rop	
Dicot	Convolvulaceae	*Aniseia martinicensis*		Urutenbweta
Dicot	Convolvulaceae	*Decalobanthus peltatus*	American rop, Big lif	Tabwatabwa
Dicot	Convolvulaceae	*Stictocardia tiliifolia*	Big lif rop	
Dicot	Cornaceae	*Alangium vitiense*		Lol aranbuluki
Dicot	Corynocarpaceae	*Corynocarpus similis*	Wael pea	
Dicot	Brassicaceae	*Rorippa sarmentosa*		
Dicot	Cucurbitaceae	*Diplocyclos palmatus*	Brewa	
Dicot	Cucurbitaceae	*Trichosanthes dieniensis*	Brewa	Taravwaravwa
Dicot	Dichapetalaceae	*Dichapetalaceae timoriense*		
Dicot	Dilleniaceae	*Dillenia biflora*	Big lif tri	
Monocot	Dioscoreaceae	*Dioscorea bulbifera*	Wael potato	Bwevu
Dicot	Euphorbiaceae	*Acalypha caturus*	Naorpos	Garabihu
Dicot	Euphorbiaceae	*Acalypha grandis*	Naorpos	Garabihu
Dicot	Euphorbiaceae	*Aleurites moluccanus*	Oel nut tri	Wahewahe
Dicot	Euphorbiaceae	*Claoxylon psilogyne*	Padel tri	Tavihevihe
Fern	Thelypteridaceae	*Pronephrium*	Fen	Kum gasigasi lalavoa rauna nanava
Monocot	Arecaceae	*Cocos nucifera*	Coconut	Niu
Dicot	Euphorbiaceae	*Codiaeum variegatum*	Nasasa	Hahalinrevo
Dicot	Euphorbiaceae	*Croton sp(levatii?)**		Mamahao
Dicot	Euphorbiaceae	*Homalanthus nutans*	Klis wota	Halongi
Dicot	Euphorbiaceae	*Macaranga dioica*	Navenue	Venue
Dicot	Euphorbiaceae	*Pimelodendron amboinicum*		
Dicot	Euphorbiaceae	*Macaranga tanarius*	Waet navenu	Venue boe
Dicot	Fabaceae	*Adenanthera pavonina*	Red bin tri	Bisa
Dicot	Fabaceae	*Bauhinia variegata*	Hat lif tri	
Dicot	Fabaceae	*Albizia lebbeck*	Bisa tri	Lidelide
Dicot	Fabaceae	*Caesalpinia crista*	Uk rop	Gaotutuiga
Dicot	Fabaceae	*Cajanus cajan*	Waet bin	Bingai
Dicot	Fabaceae	*Senna obtusifolia*		
Dicot	Fabaceae	*Senna occidentalis*		
Dicot	Salicaceae	*Casearia*		Gaikolo lol aran buluki
Dicot	Fabaceae	*Hanslia ormocarpoides*		
Dicot	Fabaceae	*Desmodium incanum*	Kolekole frut	Mera gan ova
Dicot	Fabaceae	*Dendrolobium umbellatum*		Huhugave
Dicot	Fabaceae	*Flemingia strobilifera*		
Dicot	Fabaceae	*Entada phaseoloides*	Snek rop	Gaovauru
Dicot	Fabaceae	*Indigofera zollingeriana*	Wael waetbin	

Dicot	Fabaceae	*Mimosa pudica*	Nil gras	Grass nail
Dicot	Fabaceae	*Pongamia pinnata*	Woman natora	Sileagi
Dicot	Fabaceae	*Pterocarpus indicus*	Bluwota	Nanara
Dicot	Fabaceae	*Pueraria montana var. lobata*	Disasta rop	Aga
Dicot	Fabaceae	*Inocarpus fagifer*	Namambe	Mwambwe
Dicot	Gesneriaceae	*Cyrtandra aneiteensis*		Bwebwerua
Dicot	Hernandiaceae	*Gyrocarpus americanus*	Waetwud, kenu tri	Ove
Dicot	Icacinaceae	*Merrilliodendron megacarpum*		
Dicot	Lamiaceae	*Coleus scutellarioides*		Hoanga
Dicot	Lamiaceae	*Volkameria inermis*		
Dicot	Lecythidaceae	*Barringtonia edulis*	Navel	Vele
Dicot	Malvaceae	*Kleinhovia hospita*	Namadal	Habwega
Dicot	Malvaceae	*Sida rhombifolia*	Brum kras	Ehara
Dicot	Malvaceae	*Melochia odorata*	Red namatal	habwega maita
Dicot	Malvaceae	*Urena lobata*		Aranbuluki
Dicot	Meliaceae	*Dysoxylum aneityense*	Red stinkwud	Gatabola gan bwaratu
Dicot	Moraceae	*Antiaris toxicaria*	Melek tri	Vaone
Dicot	Moraceae	*Ficus adenosperma*	Nabalango	Nunumwi
Dicot	Moraceae	*Ficus aspera*	Nabalango	Buliva
Dicot	Moraceae	*Ficus obliqua*	Nabanga	Revrevo
Dicot	Myrtaceae	*Syzygium malaccense*	Nakavika	Gaviga
Dicot	Nyctaginaceae	*Pisonia aculeata*		
Dicot	Passifloraceae	*Passiflora maliformis*		
Dicot	Passifloraceae	*Passiflora foetida*	Wael pasin frut	Gao gan garivi
Dicot	Phyllanthaceae	*Bischofia javanica*	Nakoka	Igoga
Dicot	Phyllanthaceae	*Antidesma ghaesembilla*		
Dicot	Phyllanthaceae	*Breynia disticha*		Dame
Dicot	Phyllanthaceae	*Glochidion ramiflorum*	Wael namamao	Mwamwalau
Dicot	Phyllanthaceae	*Phyllanthus amarus*		Gaingal garivi
Dicot	Piperaceae	*Macropiper latifolium*	Wael kava	Bwagogo
Dicot	Piperaceae	*Piper macropiper*	Wael pepa	
Dicot	Piperaceae	*Piper mestonii*	Wael pepa	
Dicot	Primulaceae	*Maesa sp(bennettii?)**		Bwatidumi
Dicot	Rubiaceae	*Dolicholobium aneityense*		
Dicot	Rubiaceae	*Gardenia tannaensis*		Gaimwarara
Dicot	Rubiaceae	*Geophila repens*		Ram mauri aten niu
Dicot	Rubiaceae	*Ixora asme*		
Dicot	Rubiaceae	*Ixora triflora*		Tabwema
Dicot	Rubiaceae	*Morinda citrifolia*	Noni yalo tri	Ghuresi
Dicot	Rubiaceae	*Pavetta opulina*		
Dicot	Rubiaceae	*Eumachia forsteriana*		
Dicot	Rubiaceae	*Psychotria milnei*		
Dicot	Rubiaceae	*Eumachia trichostoma*		
Dicot	Rubiaceae	*Psychotria trichotoma*		Sesbu

Dicot	Rubiaceae	*Psydrax odorata*		Ara manu
Dicot	Rubiaceae	*Tarenna sambucina*		
Dicot	Rutaceae	*Citrus × sinensis*	Aranis	
Dicot	Rutaceae	*Euodia hortensis*		Bwangi
Dicot	Rutaceae	*Melicope forbesii*		
Dicot	Rutaceae	*Micromelum minutum*	Snek tri	Gaiavu langu
Dicot	Rutaceae	*Murraya paniculata*	Natsama nel	Karasol
Dicot	Sapindaceae	*Elattostachys apetala*		
Dicot	Sapindaceae	*Pometia pinnata*	Nandao	Dao
Monocot	Smilacaceae	*Smilax vitiensis*		
Dicot	Solanaceae	*Solanum seaforthianum*	Mabor	
Dicot	Solanaceae	*Solanum nodiflorum*	Mabor	Ganlivusmalava
Dicot	Solanaceae	*Physalis angulata*	Dingi lif	Dingrae
Dicot	Solanaceae	*Solanum lycopersicum*	Tomato	Tomato
Dicot	Solanaceae	*Capsicum frutescens*	Pima	Pima ganmanu
Dicot	Urticaceae	*Boehmeria platyphylla*	Aravoa	
Dicot	Urticaceae	*Dendrocnide harveyi*	Big nagalat	Galato
Dicot	Urticaceae	*Dendrocnide latifolia*	Smol nagalat	Galato
Dicot	Urticaceae	*Elatostema beccarii*		Bwatmamaragai
Dicot	Urticaceae	*Elatostema macrophyllum*		Aha aha
Dicot	Urticaceae	*Elatostema novae-britanniae*		Bwatmamaragai
Dicot	Urticaceae	*Elatostema salomonense*		Bwatmamaragai
Dicot	Urticaceae	*Laportea interrupta*		
Dicot	Urticaceae	*Leucosyke australis*		Gauhi
Dicot	Urticaceae	*Leucosyke corymbulosa*		Arimwaduru
Dicot	Urticaceae	*Nothocnide repanda*	Nadamai rop	Gao mwalabwelabwe
Dicot	Urticaceae	*Pipturus argenteus*	Nadamai	Adomwae
Dicot	Verbenaceae	*Phyla nodiflora*		
Dicot	Vitaceae	*Leea indica*		Galivanboe
Dicot	Vitaceae	*Cayratia trifolia*	Wael waen rop	Maratangtangi
Monocot	Marantaceae	*Donax canniformis*	crapting plant	Nene
Dicot	Myristicaceae	*Myristica inutilis*	Nandai	Gaowaga
Monocot	Arecaceae	*Veitchia sp*	Palm	Niuniu
Dicot	Euphorbiaceae	*Endospermum medullosum*	Waetwud	Gaimaita

Table 14: Site 6 Avwaririm - inventory checklist.

Class	Family	Scientific name	Common name in Bislama (Vanuatu pidgin)	Local name in Hano dialect of North Pentecost
Dicot	Acanthaceae	*Pseuderanthemum aubertii*	Borbora tri	Muramura ngalana
Dicot	Achariaceae	*Pangium edule*	Nabange	Vange
Dicot	Aizoaceae	*Sesuvium portulacastrum*		Gaototovuni
Dicot	Verbenaceae	*Verbenaceae*		
Dicot	Amaranthaceae	*Achyranthes aspera*		Haldeo

Dicot	Amaranthaceae	*Cyathula prostrata*		
Dicot	Amaranthaceae	*Deeringia arborescens*		
Dicot	Acanthaceae	*Iresine diffusa f. herbstii*		
Dicot	Anacardiaceae	*Dracontomelon vitiense*	Nakatambol	Gatabola
Dicot	Anacardiaceae	*Pleiogynium timoriense*	Red nakatambol	Gatabolu ganbwaratu
Dicot	Apocynaceae	*Vincetoxicum biglandulosum*		
Dicot	Araliaceae	*Polyscias multijuga*	Wael nalalas	Malbeibei
Dicot	Araliaceae	*Polyscias scutellaria*	Nalalas	Bei
Dicot	Araliaceae	*Polyscias cumingiana*	Nalalas	Bei
Dicot	Araliaceae	*Schefflera neoebudica*	Wael nalalas	
Dicot	Aristolochiaceae	*Aristolochia vitiensis*	Taktak flaoa	
Dicot	Asteraceae	*Mikania micrantha*	Fetasid	Gruadei
Dicot	Araliaceae	*Meryta neoebudica*	Wael nalalas	Bwabwalo
Dicot	Asteraceae	*Wollastonia biflora*	Wael san flaoa	Vwenue
Dicot	Bignoniaceae	*Dolichandrone spathacea*	Flaenfoxtri	
Dicot	Boraginaceae	*Heliotropium foertherianum*	Butaflaetri	
Dicot	Boraginaceae	*Cordia dichotoma*	Glutri	Vwaibulu
Dicot	Boraginaceae	*Cordia subcordata*	Trompet flaoatri	Montanga
Dicot	Boraginaceae	*Heliotropium indicum*		
Dicot	Burseraceae	*Canarium indicum*	Nangai	Agai
Dicot	Burseraceae	*Garuga floribunda*	Namalaus	Malauhi
Dicot	Cannabaceae	*Celtis paniculata*		
Dicot	Cannabaceae	*Trema cannabina*	Grinpijin tri	Doudou
Dicot	Capparaceae	*Capparis spinosa*		
Dicot	Casuarinaceae	*Casuarina equisetifolia*	Oktri or Siok	Gairoro
Dicot	Convolvulaceae	*Ipomoea indica*	Wael kumala flaoa	
Dicot	Convolvulaceae	*Aniseia martinicensis*		
Dicot	Convolvulaceae	*Decalobanthus peltatus*	American rop or Biglif rop	
Dicot	Convolvulaceae	*Stictocardia tiliifolia*		
Dicot	Cornaceae	*Alangium vitiense*		
Dicot	Corynocarpaceae	*Corynocarpus similis*	Wae pea	
Dicot	Brassicaceae	*Rorippa sarmentosa*		
Dicot	Cucurbitaceae	*Diplocyclos palmatus*	Brewa	
Dicot	Cucurbitaceae	*Trichosanthes dieniensis*	Brewa	Taravwaravwa
Dicot	Dichapetalaceae	*Dichapetalum vitiense*		Gao bwatidumwi
Dicot	Dichapetalaceae	*Dichapetalaceae*		
Dicot	Dilleniaceae	*Dillenia biflora*		
Monocot	Dioscoreaceae	*Dioscorea bulbifera*	Wael potato	Bwevu
Dicot	Euphorbiaceae	*Acalypha forsteriana*	Naorpos	Garabihu
Dicot	Euphorbiaceae	*Acalypha grandis*	Naorpos	Garabihu
Dicot	Euphorbiaceae	*Aleurites moluccanus*	Oel nut tri	Wahewahe
Dicot	Euphorbiaceae	*Claoxylon sp (gillisonii?)**	Padel tri	Tavihevihe
Dicot	Euphorbiaceae	*Claoxylon psilogyne*	Padel tri	
Dicot	Euphorbiaceae	*Cleidion javanicum*	Tuinwan tri	
Fern	Thelypteridaceae	*Pronephrium*	Fen	
Monocot	Arecaceae	*Cocos nucifera*	Koconut	Niu
Dicot	Burseraceae	*Canarium indicum*	Nangai	Agai
Dicot	Euphorbiaceae	*Codiaeum variegatum*	Nasasa	Hahalinrevo
Dicot	Euphorbiaceae	*Croton sp (levatii?)**		Mamahao

Dicot	Euphorbiaceae	*Homalanthus nutans*	Klis wota	Halongi
Dicot	Euphorbiaceae	*Macaranga dioica*	Red Navenue	Venue lei
Dicot	Euphorbiaceae	*Pimelodendron amboinicum*		
Dicot	Euphorbiaceae	*Macaranga tanarius*	Waet navenu	Venue boe
Dicot	Fabaceae	*Adenanthera pavonina*	Red bintri	Bisa
Dicot	Fabaceae	*Bauhinia variegata*	Hatlif tri	
Dicot	Fabaceae	*Albizia lebbeck*	Bisa tri	
Dicot	Fabaceae	*Caesalpinia crista*	Ukrop	Gaotutuiga
Dicot	Fabaceae	*Cajanus cajan*	Waet bin	Bingai
Dicot	Fabaceae	*Senna obtusifolia*		
Dicot	Fabaceae	*Senna occidentalis*		
Dicot	Salicaceae	*Casearia*		
Dicot	Fabaceae	*Hanslia ormocarpoides*		
Dicot	Fabaceae	*Desmodium incanum*	Kolekole frut	Mera gan ova
Dicot	Fabaceae	*Dendrolobium umbellatum*		Huhugave
Dicot	Fabaceae	*Flemingia strobilifera*		
Dicot	Malvaceae	*Kleinhovia hospita*		
Dicot	Malvaceae	*Sida rhombifolia*	Brum kras	Ihara
Dicot	Malvaceae	*Melochia odorata*	Red namatal	Habwega memea
Dicot	Malvaceae	*Urena lobata*		Matemui
Dicot	Meliaceae	*Dysoxylum aneityense*	Red stinkwud	Gatabola gan bwaratu
Dicot	Moraceae	*Ficus adenosperma*	Nabalango	Nunumwi
Dicot	Moraceae	*Ficus aspera*	Nabalango	Buliva
Dicot	Moraceae	*Ficus obliqua*	Nabanga	Revrevo
Dicot	Myrtaceae	*Syzygium malaccense*	Nakavika	Gaviga bwatimanu
Dicot	Myristicaceae	*Myristica inutilis*	Nandai	Ghaoaga
Dicot	Nyctaginaceae	*Pisonia aculeata*		
Dicot	Passifloraceae	*Passiflora maliformis*	Wael pasin frut	Gao gan garivi
Dicot	Passifloraceae	*Passiflora foetida*	Wael pasin frut	
Dicot	Phyllanthaceae	*Bischofia javanica*	Nakoka	Igoga
Dicot	Phyllanthaceae	*Antidesma ghaesembilla*		
Dicot	Phyllanthaceae	*Breynia disticha*		Dame vatu
Dicot	Phyllanthaceae	*Glochidion ramiflorum*	Wael namamao	Mwamwalau
Dicot	Phyllanthaceae	*Phyllanthus amarus*		Gaingal garivi
Dicot	Piperaceae	*Macropiper latifolium*	Wael kava	Bwagogo
Dicot	Piperaceae	*Piper macropiper*	Wael pepa	
Dicot	Piperaceae	*Piper mestonii*	Wael pepa	
Dicot	Primulaceae	*Maesa sp(bennettii?)**		Bwatidumi
Dicot	Primulaceae	*Maesa sp(aneiteensis?)**		
Dicot	Rubiaceae	*Dolicholobium aneityense*		
Dicot	Rubiaceae	*Gardenia tannaensis*	Tahiti tiare	Gaimwarara
Dicot	Rubiaceae	*Geophila repens*		Ram mauri aten niu
Dicot	Rubiaceae	*Ixora asme*		Virana memea Kun gaviga Sara
Dicot	Rubiaceae	*Ixora triflora*		Tabwema
Dicot	Rubiaceae	*Morinda citrifolia*	Noni or Yalo tree	Ghuresi
Dicot	Rubiaceae	*Mussaenda cylindrocarpa*	Flaoa lif	
Dicot	Rubiaceae	*Pavetta opulina*		Tabwema
Dicot	Rubiaceae	*Eumachia forsteriana*		

Dicot	Rubiaceae	*Psychotria milnei*		Sesebu
Dicot	Rubiaceae	*Eumachia trichostoma*		
Dicot	Rubiaceae	*Psychotria nacdado*		Sesbu
Fern	Lindsaeaceae	*Alsophila archboldii*	Blak pam	Bosia
Fern	Lomariopsidaceae	*Alsophila batjanensis*	Blak pam	Bosia
Fern	Lygodiaceae	*Alsophila vieillardii*	Blak pam	Bosia
Dicot	Urticaceae	*Dendrocnide harveyi*	Big nagalat	ngalato
Dicot	Urticaceae	*Dendroncnide latifolia*	Smol nagalat	ngalato
Fern	Marattiaceae	*Amblovenatum immersum*	Fen	
Fern	Nephrolepidaceae	*Angiopteris evecta*	Kabis fen	sibwagoa
Fern	Oleandraceae	*Antrophyum callifolium*	Fen	
Fern	Ophioglossaceae	*Antrophyum plantagineum*	Fen	
Fern	Osmundaceae	*Antrophyum smithii*	Fen	
Fern	Polypodiaceae	*Antrophyum subfalcatum*	Fen	
Fern	Psilotaceae	*Arachniodes aristata*	Fen	
Fern	Pteridaceae	*Arthropteris palisotii*	Fen	
Fern	Saccolomataceae	*Asplenium aethiopicum*	Fen	
Fern	Schizaeaceae	*Asplenium amboinense*	Fen	
Fern	Tectariaceae	*Asplenium sp(aneitense?)**	Fen	
Fern	Thelypteridaceae	*Asplenium australasicum*	Fen	
Fern	Araliaceae	*Asplenium bipinnatifidum*	Fen	
Fern	Aspleniaceae	*Asplenium sp(brachycarpum?)**	Fen	Bwihibwihi gamali
Fern	Asteraceae	*Asplenium carruthersii*	Fen	
Fern	Athyriaceae	*Asplenium caudatum*	Fen	Galhaharia
Fern	Blechnaceae	*Asplenium contiguum*	Fen	
Fern	Cyatheaceae	*Asplenium cuneatum*	Fen	
Fern	Davalliaceae	*Asplenium sp (diplotion?)**	Fen	
Fern	Dennstaedtiaceae	*Asplenium gibberosum*	Fen	
Fern	Dicksoniaceae	*Asplenium horridum*	Fen	
Fern	Diplaziopsidaceae	*Asplenium insiticium*	Fen	
Fern	Dipteridaceae	*Asplenium laserpitiifolium*	Fen	
Fern	Dryopteridaceae	*Asplenium listeri*	Fen	
Fern	Equisetaceae	*Asplenium marattioides*	Fen	
Fern	Gleicheniaceae	*Asplenium nidus*	Bed blong pijin	Bugesi
Fern	Hymenophyllaceae	*Asplenium polyodon*	Fen	Lilibe hinge
Fern	Hypodematiaceae	*Asplenium subflexuosum*	Fen	
Fern	Lindsaeaceae	*Austroblechnum melanocaulon*	Fen	
Fern	Lomariopsidaceae	*Austroblechnum norfolkianum*	Fen	
Fern	Lygodiaceae	*Austrogramme decipiens*	Fen	
Fern	Marattiaceae	*Blechnopsis orientalis*	Fen	
Fern	Nephrolepidaceae	*Bolbitis lonchophora*	Fen	
Fern	Oleandraceae	*Bolbitis quoyana*	Fen	
Fern	Ophioglossaceae	*Bolbitis rivularis*	Fen	
Fern	Osmundaceae	*Callistopteris apiifolia*	Nalimlum fen	

Species marked with an * are described as ‘Individuals showing characteristics associated with the species named in parentheses. Confirmation of identification

would be an essential first step prior to using these species for conservation purposes.

2.5 CONCLUSION AND RECOMMENDATIONS

After the organization and analysis of data collected during the assessment, we can conclude that the current land use system for the communities of North Pentecost does not support the natural and healthy growing conditions for the trigger species, the Devil Palm.

Given the profitable source of income from the agriculture crop especially kava, a relatively high percentage of the communities of North Pentecost confirmed that clearing of the natural forest for the cultivation of kava is on the rise and may be one of the reasons for the loss or decrease of the Devil Palm species on North Pentecost. It will be of the best interest to the Department of Environment to act accordingly on the recommendations of this report to find solutions for the immediate restoration of the Devil Palm and management of native forest overall on North Pentecost.

2.6 DEVIL PALM CONSERVATION

- The KBA boundary is to be extended to the south to cover new Devil Palm stands recorded at lol Bwibwi and Afaririm
- Care must be taken by farmers to protect stands near garden areas and allow growth of young palms.
- Stands that are heavily shaded by canopy need to be cleared to allow sunlight to promote germination and growth of young palms
- Stands exposed to cattle grazing need extra protective measures such as fencing off the stands to allow growth of samplings and young palms.
- DEPC to develop labelling to be setup on each stands to better identify the stands and promote its protection.
- Continue to provide awareness and education about the endemic Palm for its protection.
- Setting up nursery to mass produce the palm for replanting and for sale as ornaments and for replanting in other islands to preserve the species.
- A management plan need to be developed as soon as possible to address identified threats to the Devil Palm and recommend measures to be taken to promote conservation of the species.

2.7 ASSOCIATED FAUNA SPECIES WITH DEVIL PALM

It was further confirmed that reptile and insect assessment should be carried out preferably during the dryer season, around middle of the year.

2.8 COMMUNITY CONSERVATION AREAS

- Pentecost is the biggest kava producing island in Vanuatu and as kava growing is increasing, native forest are being cleared for kava farms which pose risk of loss of native forest species. Community conservation areas are encouraged to be established to preserve native flora and fauna species and flying foxes and also endemic Devil Palm where it exists.
- Community nursery should be encouraged in communities where Devil Palm is present to support replanting activities and as an income activity.

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Appendix

APPENDIX 1: BIRD SURVEY INFORMATION

Bird survey information captured for each observation of each species at each of the stations. These data are transposed for the purposes of analysis – but are captured in this form as they align with the automatic loading of data onto eBird.

Note that in the example shown below all observations were from Station 337 on a 5-minute point count starting at 11.28hrs. For each station the date, habitat, weather and wind information are constant.

Table 15: Bird survey information captured for each observation of each species at each of the stations.

Column Data	Row 1	Row 2	Row 3
English name	Melanesian Flycatcher	Cardinal Myzomela	White-rumped Swiftlet
Scientific name	*Myiagra caledonica*	*Myzomela cardinalis*	*Aerodramus spodiopygius*
Date	06/09/2022	06/09/2022	06/09/2022
Time	11:28:19	11:30:10	11:31:06
Within 5 min point count?	1	1	1
Number of individuals	1	3	1
Method of observation	Heard	Heard	Seen
Station	337	337	337
Habitat	Cultivated land and pastures	Cultivated land and pastures	Cultivated land and pastures
Weather	Sunny	Sunny	Sunny
Wind	Mild wind (leaves move)	Mild wind (leaves move)	Mild wind (leaves move)
Notes			

APPENDIX 2: BIORAP SURVEY IMAGES

Figure 27: Team travelling by sea to Pentecost.

Figure 28: Devil Palm sapling

Figure 29: Young Devil Palm

Figure 30: Mature Devil Palm tree

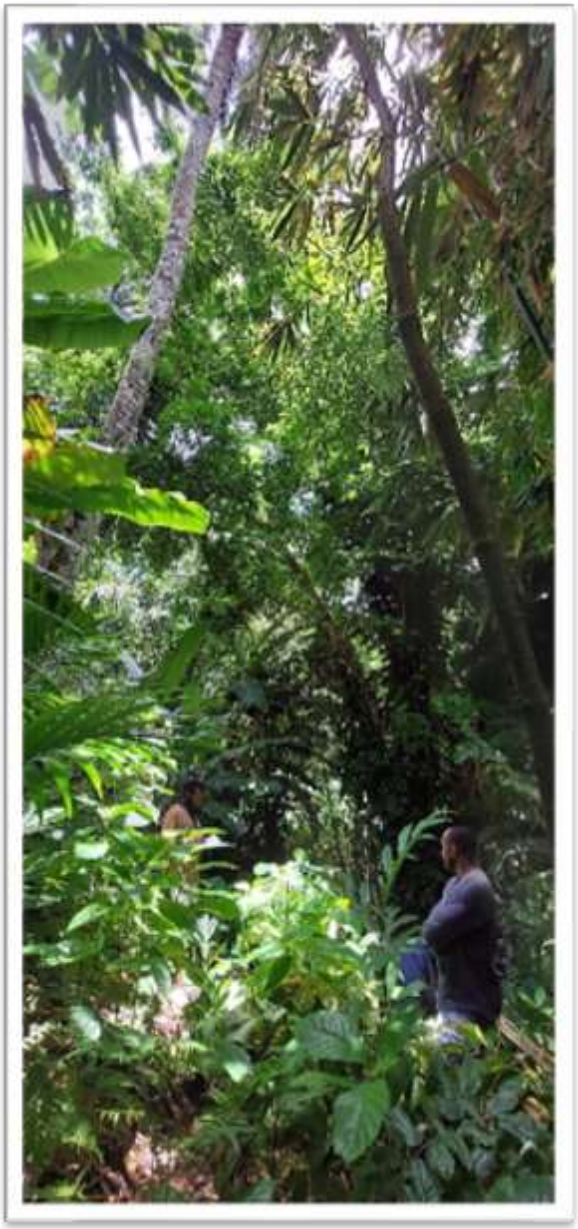
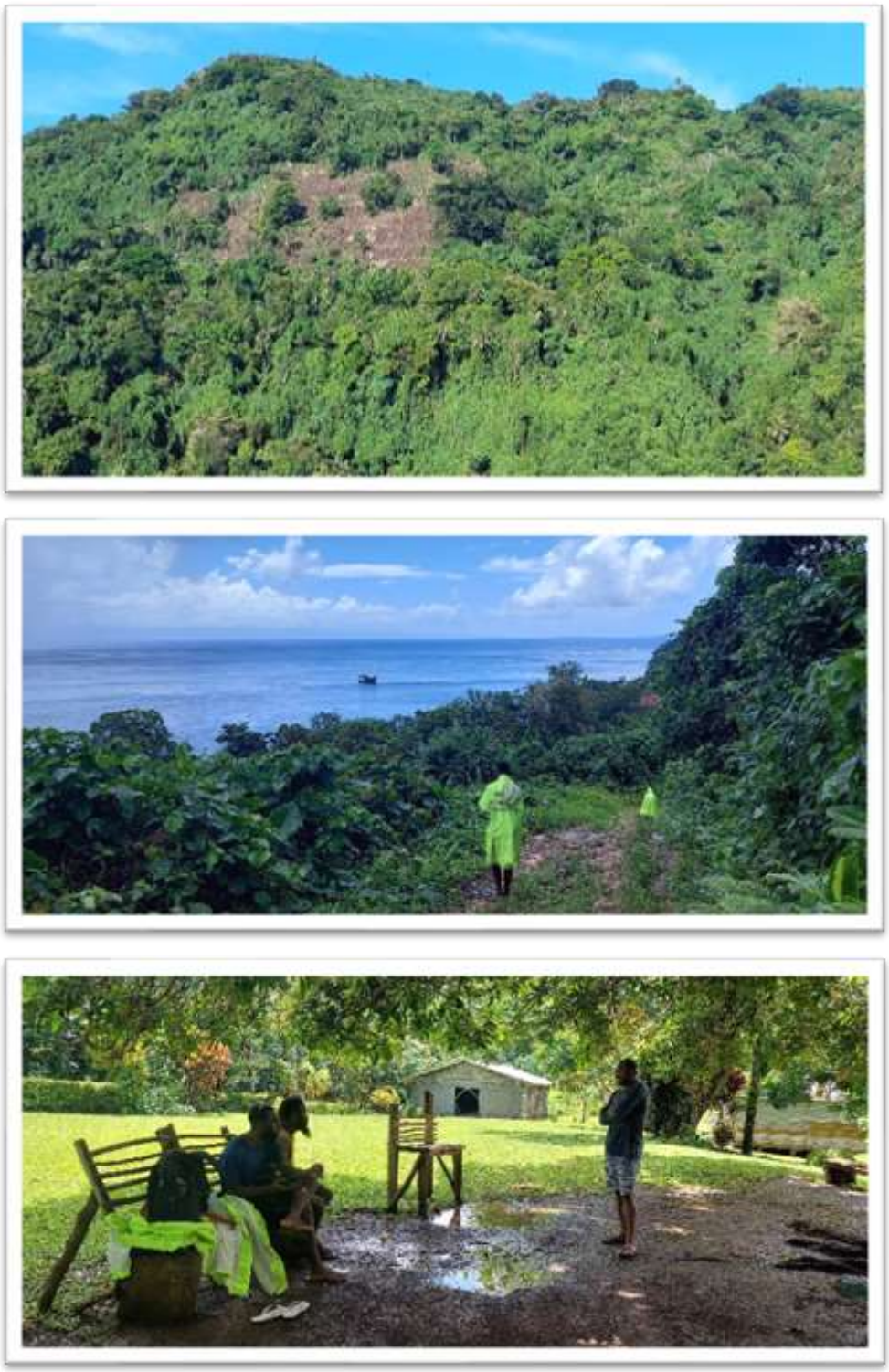


Figure 31: Native forest

Figure 32: Photos of survey activities at the sites.



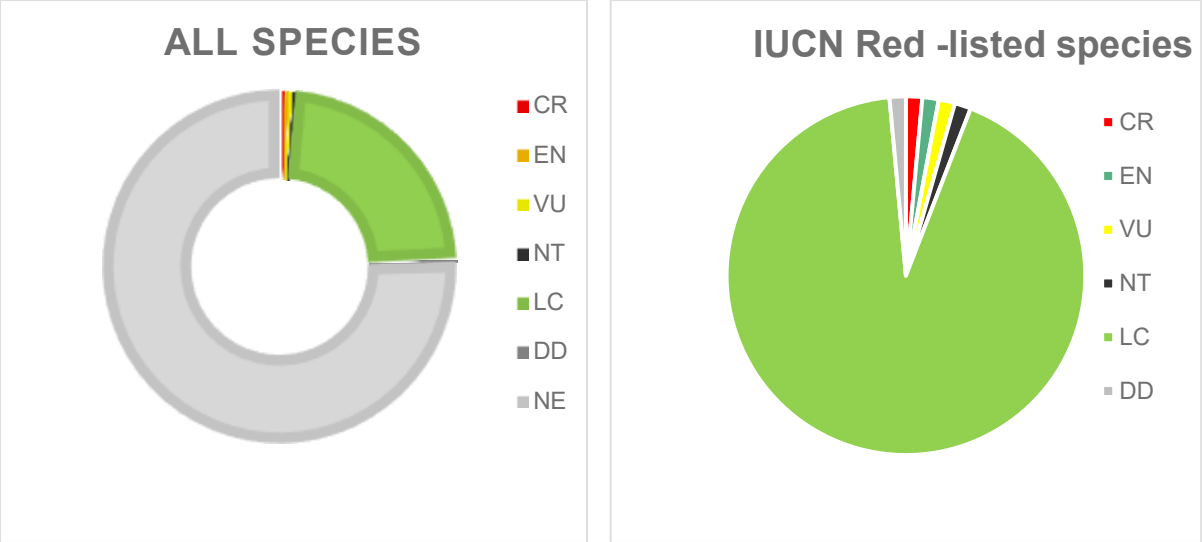
APPENDIX 3: PRIORITISING THE PLANT SPECIES RECORDED AT NORTH PENTECOST

3.1 IUCN RED LIST SPECIES RECORDED AT NORTH PENTECOST

Doro *et al* (2024) recorded 277 species of plant during the survey of North Pentecost. Of these 277 species only 67 have been assessed under the IUCN Red List for species. And of these only 3 are considered Globally-threatened.

Key Biodiversity Area trigger species consider globally threatened species under Criteria 1a-e. The extent to which these three species qualify as trigger species for the North Pentecost data will be further considered below.

Figure 33: The number of species assessed under the IUCN Red List, and distribution of species across the Red List criteria.



CR – Critically Endangered. EN – Endangered. VU – Vulnerable (these are all considered to be Globally-threatened species). NT – Near-threatened, LC – Least Concern. DD – Data deficient. NE – Not-evaluated.

3.2 THE NUMBER OF ENDEMIC AND INTRODUCED PLANT SPECIES RECORDED IN NORTH PENTECOST.

235 of the species are considered to be native – with 42 listed as Introduced to Vanuatu. Of these 235, 27 are likely endemic to Vanuatu.

Figure 34: The number of endemic species in each plant taxonomic group in Vanuatu.

Taxonomic Group	Number of Species	Endemic or Near-Endemic	Number Required for B2
Gentianales	24	4	4
Malpighiales	28	4	3
Polypodiopsida	56	3	2
Ericales	10	3	2
Apiales	8	2	2
Arecales	3	2	2
Lamiales	8	2	4
Cucurbitales	3	1	2
Laurales	3	1	2
Myrtales	4	1	2
Rosales	22	1	2
Sapindales	17	1	2

Species that have not been assessed under the IUCN Red List can, nevertheless, be considered as trigger species for KBAs under criteria B1 and B2. Under B1 10% of the species population (by number or by range) should occur on the proposed KBA. Under B2 1% or more of a group of species within a taxonomic group, with a Global Range of less than 10,000km^2 are required to trigger this criterion.

The Taxonomic Group, here, is based on the Plant Orders for Monocot- and Dicotyledonous plants, and Class for Ferns. These groupings are based on the global number of species per Order/Class which, in turn, is used to determine the numbers of 'Co-occurring Geographically Restricted Species' at the site – the B2 Criteria for KBAs. The 'Number required for B2' in Table 1 is a KBA criterion. It is determined by the number of species in the taxon and is the whole number that represents 0.02% of all species in the taxonomic group, with 2 being the minimum number. For example, just 2 species of Ericales will trigger criterion B2, while 4 species of Lamiales are required.

Endemicity is determined from the Vanuatu Plant Checklist website https://pvnh.net/. Two species there were considered to be possibly endemic – but are considered to be endemic in the following review. The land area of Vanuatu is 12,189km^2 – so a species that occurs on all islands within Vanuatu will not be considered Geographically restricted in Range. We will use the maps in the Vanuatu Plant Checklist and/or the maps on GBIF for the endemic species to consider whether their currently known range is likely to be less than 10,000km^2, ie Geographically Restricted in Range.

Table 34 indicates that there are 6 taxonomic groups that may have enough species to qualify under criterion B2 Co-occurring Geographically Restricted species. That is, there are at least as many endemic species in the taxonomic group as are required under criterion B2. These groups will be assessed in more detail below.

3.3 THE TAXONOMIC GROUPS

1. Gentianales, c20,000 species globally, 0.02% is 4 species, the number required to represent B2.

A] Alyxia efatensis

- Survey 2022: Recorded at 3 of the 6 sites in North Pentecost – Atangai, Lol bwibwi and Lol Ureure.
- Vanuatu Plant Checklist data. Collected from Santo to Aneityum – including Maewo – but not previously from Pentecost. Not collected from the Torba Province (882km^2). Subtracting Torba Province from the land area of Vanuatu does not mean that the Range of this species is less than 10,000 km^2,

  Alyxia efatensis does not, therefore, qualify as a Range-restricted species.

B] Dolicholobium aneityense:

- Survey 2022: Recorded at 5 of the 6 sites in North Pentecost – Atangai, Avwaririm, Lol bwibwi, Lol Niuniu Tatu, Lol Ureure.
- Vanuatu Plant checklist. Collected from Santo and Malekula, also Ambae, down to Tanna and Aneityum. Not previously recorded on the Maewo/Pentecost/Ambrym chain. Not recorded on the Banks Islands. The species could only be considered to have a Range of less than 10,000km^2 if the Maewo, Pentecost chain was excluded.

  Dolicholobium aneityense does not, therefore, qualify as a Range-restricted species.

C] Gardenia tannaensis:

- Survey 2022: Recorded at 5 of the 6 sites in North Pentecost – Atangai, Avwaririm, Lol bwibwi, Lol Niuniu Tatu, Lol Ureure.
- Vanuatu Plant checklist. Collected from all island groups from the Torres Islands to Aneityum. Absent only from Epi. Range therefore likely to be in excess of 10,000km^2.

  Gardenia tannaensis does not, therefore, qualify as a Range-restricted species.

D] Ixora asme

- Survey 2022: Recorded at 5 of the 6 sites in North Pentecost – Atangai, Avwaririm, Lol bwibwi, Lol Niuniu Tatu, Lol Ureure.
- Vanuatu Plant checklist. This species has been recorded from the Torres Islands and Banks Islands south to Erromango, including Maewo and Pentecost. The land area of TAFEA minus Erromango is 740km^2. 12,189-740 is 11,449 which is higher than the 10,000km^2 upper limit for Range-restricted species.

  Ixora asme, therefore, does not qualify as a Range-restricted species.

In summary, none of the endemic Gentianales species qualify as Geographically Restricted species and, therefore, do not qualify under KBA criterion B2. Further work, to review the IUCN Red List status of these species and/or to review the upper limit for Geographically restricted species in this taxonomic group may modify these conclusions.

2. Malpighiales, C16,000 species globally. 0.02% of this is 3.2 – there needs to be at least 3 Geographically-restricted species from this taxonomic group to qualify under KBA Criterion B2.

A] Acalypha forsteriana

- Survey 2022: Recorded at 2 of the 6 sites in North Pentecost – Avwaririm and Lol Niuniu Tatu.
- Vanuatu Plant checklist. Recorded from Santo in the north to Tanna in the South. Specimens previously collected on Pentecost, but not Maewo. The land area of TORBA+ Aneityum is insufficient to reduce the range of the species to less than 10,000km^2, the upper limit for Range-restricted species.

  Acalypha forsteriana, therefore, does not qualify as a range restricted species.

B] Claoxlyon sp (gillisonii?)

- Survey 2022: Individuals showing characteristics associated with *C. gillisonii* were recorded at 2 of the 6 sites in North Pentecost – Avwaririm and Lol Niuniu Tatu.
- Vanuatu Plant Checklist. From Malekula and Ambrym, in the north, to Erromango in the south. The range for this species, if Torba Province, Santo and Tanna and adjacent islands are excluded would approximate to 6,610km^2 – it would qualify as a Geographically Restricted Range species. The species has not previously been reported from Pentecost.

  Claoxylon gillisonii, therefore, does qualify as a range-restricted species.

C] Claoxylon psilogyne

- Survey 2022: Recorded at 5 of the 6 sites in North Pentecost – Atangai, Avwaririm, Lol bwibwi, Lol Niuniu Tatu and Lol Ureure.
- Vanuatu Plant checklist. From Santo south to Tanna. The range of this species is likely to exceed the 10,000km^2 upper limit for Restricted Range species. The species has previously been recorded on Pentecost.

  Claoxylon psilogyne, therefore, does not qualify as a range-restricted species.

D] Croton spp (levatii?)

- Survey 2022: Individuals showing characteristics associated with *Croton levatii* were recorded at all six of the sites surveyed in North Pentecost, Atangai, Avat galena, Avwaririm, Lol bwibwi, Lol Niuniu Tatu and Lol Ureure.
- Vanuatu Plant Checklist: Recorded from Malekula, Ambrym and Efate only. Clearly a restricted-range species. Not previously collected from anywhere in

PENAMA. IF we assume that the range is, indeed, the 3 named islands plus PENAMA province then the species range sums to 4,815km^2.

Croton levatii does qualify as a Geographically Range-restricted species.

E] Endospermum medullosum

- Survey 2022: Recorded from 2 of the six sites surveyed in North Pentecost, Atangai and Lol bwibwi.
- Vanuatu Plant Checklist: Recorded from the Banks Island to Efate. Also present in Australia, Indonesia, the Solomon Islands and Papua New Guinea. Listed as Vulnerable under the IUCN Red List for Species. There is no population estimate, and no estimate of the number of occupied localities. The range of the species is exceedingly large – and so it is unlikely that this will qualify as a trigger species under any criteria.

In summary, two of the endemic Malpighiales species recorded on North Pentecost in 2022 are Geographically Restricted in Range such that they qualify as candidate species for the KBA B2 criterion. However, there needs to be at least 3 species of Malpighiales species to trigger this criterion. Accordingly we do not consider that the Malpighiales taxonomic group triggers KBA criterion B2.

3. Polypodiopsida, C10,500 species globally. 0.02% of this is 2.1 – there needs to be at least 2 Geographically restricted species from this taxonomic group to qualify under KBA Criterion B2.

A] Asplenium spp (aneitense?)

- Survey 2022: Individuals showing characteristics associated with *A. aneitense* were recorded on 4 of the 6 sites in North Pentecost – Atangai, Avwaririm, Lol bwibwi and Lol Niuniu Tatu.
- Vanuatu Plant checklist. Not recorded as collected from any island in Vanuatu. The only two records on GBIF are both from Aneityum. If correct this is clearly a Geographically Restricted species. Records for Pentecost would be surprising – this would need confirmation.

  Aspenium aneitense, if accepted as a credible record, does, therefore, qualify as a Geographically Range-restricted species.

B] Asplenium spp (brachycarpum?)

- Survey 2022: Individuals showing characteristics associated with *A. brachycarpum* were recorded on 5 of the 6 sites in North Pentecost – Atangai, Avat galena, Avwaririm, Lol bwibwi and Lol Niuniu Tatu.
- Vanuatu Plant Checklist. Specimens collected from Santo and Efate only. If we assume that all islands between Santo and Efate are range, but that islands in Torba and Tafea Provinces are out of range for this species then we can estimate the range to be 9,681km^2 – just within the upper 10,000km^2 upper limit for Geographically restricted species. Confirmation of records in north Pentecost would, therefore, be a high priority

Asplenium brachycarpum does, therefore qualify as a Geographically range-restricted species.

C] Asplenium sp (diplotion?)

- Survey 2022: Individuals showing characteristics associated with *A. diplotion* were recorded on 5 of the 6 sites in North Pentecost – Atangai, Avat galena, Avwaririm, Lol bwibwi and Lol Niuniu Tatu.
- Vanuatu Plant Checklist. Not recorded as collected from any island in Vanuatu. There is just a single record of this species on GBIF – on Malekula. If we assume that the species is restricted to the Malampa and Penama Provinces then its range comprises just 3,977km^2. Confirmation of records in north Pentecost would, therefore, be a high priority.

  Asplenium diplotion does, therefore, qualify as a Geographically range-restricted species.

In summary, all three of the endemic Polypodiopsida, Fern, species recorded are Geographically range-restricted. However, we would need to confirm identification, as none of the species have previously been recorded in the PENAMA province and two of the species are considered to be single-island endemics. It should also be acknowledged that our knowledge of this taxon is likely to be less complete than for other plant taxa. If true, and either these species, or other newly-described species are present on north Pentecost, then we can propose that the North Pentecost KBA qualifies under the B2 criterion for the Polypodiopsida taxonomic group of species.

4. Ericales, 10,300 species globally. 0.02% of this is 2.1 – therefore, there needs to be at least 2 species from this taxonomic group to qualify under KBA Criterion B2.

A] Maesa sp. (aneiteensis?)

- Survey 2022: Individuals showing characteristics associated with *M. aneiteensis* were recorded at 2 of the 6 sites in North Pentecost, Avwaririm and Lol Niuniu Tatu.
- Vanuatu Plant Checklist. Plants previously collected only from Malekula, Efate and Erromango. Not previously collected from Pentecost. If we presumed that the range was from Malampa and Penama provinces south to Erromango then we can estimate the range to be 6,320km^2.

  Maesa aneiteensis does, therefore, qualify as a Geographically range-restricted species. However, it was recorded at only 2 of the 6 sites – so it is still unclear whether its range within the KBA exceeds 1% of the global range.

B] Maesa sp. (aubertii?)

- Survey 2022: Individuals showing characteristics associated with *M. aubertii* were recorded at just 1 of the 6 sites in North Pentecost, Avat galena.
- Vanuatu Plant Checklist. Only collected from Santo. Confirmation of records in north Pentecost would therefore be a high priority. If this species was

restricted to the SANMA and PENAMA provinces, a combined terrestrial area of 5,446km^2, then it would clearly qualify as Geographically Restricted in Range.

Maesa aubertii does, therefore, qualify as a Geographically range restricted species. However, the species was recorded at just 1 of the 6 survey sites – so it is still unclear whether its range within the KBA exceeds 1% of the global range.

C] Maesa sp. (bennettii?)

- Survey 2022: Individuals showing characteristics associated with M. bennettii were recorded at 5 of the 6 sites in North Pentecost, Atangai, Avwaririm, Lol bwibwi, Lol Niuniu Tata and Lol Ureure.
- Vanuatu Plant Checklist. Only collected from Malekula. Confirmation of records in north Pentecost would therefore be a high priority. If this species is considered restricted to Malampa and Penama provinces, a combined terrestrial area of 3,977km^2, then it would clearly qualify as Geographically Restricted in Range.

  Maesa bennettii does, therefore, qualify as a Geographically Restricted-range species. If confirmed at the site it was also recorded at 5 of the 6 sites – so can be considered to be widespread within the KBA – and thus qualifying as a candidate species under KBA criterion B2.

In summary, all 3 of the Ericales endemic species recorded on North Pentecost during this survey can be considered to be restricted range species. However, none of the three species have previously been recorded on Pentecost. If these species were confirmed as present, and if their presence within the KBA was sufficient to represent 1% or more, by area, of their global range then they could be considered to qualify as trigger species under Criterion B2, for the Ericales taxonomic group.

5. Apiales, C5,500 species globally. As 0.02% of this is less than 2 the number of species from this group is rounded up to 2 for it to qualify under KBA Criterion B2.

A] Meryta neoebudica

- Survey 2022. Recorded at 5 of the 6 sites in North Pentecost, Atangai, Avwaririm, Lol bwibwi, Lol Niuniu Tatu and Lol Ureure.
- Vanuatu Plant Checklist. Listed as ‘Near Endemic’, this species has been recorded, in Vanuatu from Santo to Aneityum. Of 124 observations of the species recorded on GBIF all but one are listed as from Vanuatu. The one record, listed as from Cook Islands, is known to be an error, the species is listed as being collected from Tanna. There are, however records from the Torres group at the north of the Torba province. Accordingly the range is, as a minimum the entire terrestrial area of Vanuatu, and so exceeds the 10,000km^2 upper limit.

Meryta neoebudica does not, therefore, qualify as a Geographically restricted-range species.

B] Schefflera neoebudica

- Survey 2022: Recorded from 2 of the 6 sites in North Pentecost, Avwaririm and Lol Niuniu Tatu.
- Vanuatu Plant Checklist. Specimens collected from the TAFEA province, in the south to the TORBA province in the north. This covers all of Vanuatu. Accordingly the species range approximates to the area of terrestrial in Vanuatu, which is in excess of 10,000km^2.

  Schefflera neoebudica does not, therefore, qualify as a Geographically restricted-range species.

In summary neither of the endemic species of Apiales qualify as Geographically Restricted-range species so this taxonomic group will not be considered as a trigger for KBA criterion B2.

6. Arecales, 2,600 species globally. As 0.02% of this is less than 2, the number of species from this group is rounded up to 2, for it to qualify under KBA criteria B2.

A] Calamus vanuatuensis

- Survey 2022: Recorded from just 1 of the 6 sites in North Pentecost, Avat galena.
- Vanuatu Plant Checklist. Recorded on most islands between the Banks Islands, to the north and Erromango to the south. If we exclude the remaining TAFEA province islands then we estimate that the range of this species is 11,449km^2. This exceeds the upper limit of 10,000km^2 for this taxonomic group, and so excludes this species from being considered under KBA criterion B2.

B] Neoveitchia brunnea

- Survey 2022: Recorded from all 6 of the sites in North Pentecost. The species presence determined the location of the sites.
- Vanuatu Plant Checklist. Recorded only from Pentecost, and indeed restricted to the North Pentecost area. This species is listed as Critically Endangered under the IUCN Red List for species, and the site qualifies as an Alliance for Zero Extinction site. It is, clearly, geographically range-restricted and qualifies under KBA criteria A1e and B1.

In summary *Neoveitchia brunnea* is the primary indicator species for the North Pentecost KBA, and the distribution of the species should reflect the boundary of the KBA.

7. Fabales, 20,900 species globally. 0.02% of this is 4.2, the number of species from this group required to trigger KBA criterion B2, is 4.

Pterocarpus indicus

- Survey 2022: Recorded at 4 of the 6 sites in North Pentecost, Atangai, Avat galena, Lol bwibwi and Lol Ureure.
- Vanuatu Plant Checklist. Recorded in Vanuatu from the Banks Islands to Erromango. This species is listed as Endangered under the IUCN Red List for species. It occurs from S.E. Asia eastwards as far as Vanuatu. There is no population estimate, and no assessment of the number of occupied localities. The range of the species will be vast and, accordingly, is unlikely to trigger any KBA criteria.

SPREP

Secretariat of the Pacific Regional Environment Programme