



BIOPHYSICALLY SPECIAL, UNIQUE MARINE AREAS OF **VANUATU**



Marine and Coastal Biodiversity Management
in Pacific Island Countries

BIOPHYSICALLY SPECIAL, UNIQUE MARINE AREAS OF **VANUATU**



Marine and Coastal Biodiversity Management
in Pacific Island Countries



On behalf of:



Federal Ministry
for the Environment, Nature Conservation,
Building and Nuclear Safety

of the Federal Republic of Germany



EFFECTIVE MANAGEMENT



Marine and coastal ecosystems of the Pacific Ocean provide benefits for all people in and beyond the region. To better understand and improve the effective management of these values on the ground, Pacific Island Countries are increasingly building institutional and personal capacities for Blue Planning.

But there is no need to reinvent the wheel, when learning from experiences of centuries of traditional management in Pacific Island Countries. Coupled with scientific approaches these experiences can strengthen effective management of the region's rich natural capital, if lessons learnt are shared.

The MACBIO project collaborates with national and regional stakeholders towards documenting effective approaches to sustainable marine resource management and conservation. The project encourages and supports stakeholders to share tried and tested concepts and instruments more widely throughout partner countries and the Oceania region.

This report outlines the process undertaken to define and describe the special, unique marine areas of Vanuatu. These special, unique marine areas provide an important input to decisions about, for example, permits, licences, EIAs and where to place different types of marine protected areas, locally managed marine areas and Community Conservation Areas in Vanuatu.

For a copy of all reports and communication material please visit www.macbio-pacific.info.

MARINE ECOSYSTEM
SERVICE VALUATION

MARINE SPATIAL PLANNING

EFFECTIVE MANAGEMENT





BIOPHYSICALLY SPECIAL, UNIQUE MARINE AREAS OF VANUATU

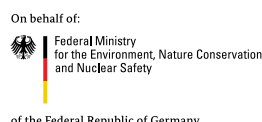
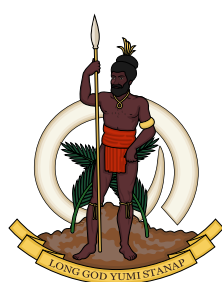
AUTHORS:

Ceccarelli DM¹, Molisa V², Wendt H³, Davey K³, Kaitu'u J⁴, Fernandes L³

2018

SUGGESTED CITATION:

Ceccarelli DM, Molisa V, Wendt H, Davey K, Kaitu'u J, Fernandes L (2018)
Biophysically special, unique marine areas of Vanuatu.
MACBIO (GIZ, IUCN, SPREP), Suva..



AUTHOR AFFILIATIONS

- 1 ARC Centre of Excellence for Coral Reef Studies, James Cook University and Marine Ecology Consultant
- 2 Vanuatu Department of Environment Protection and Conservation and IUCN

- 3 International Union for the Conservation of Nature - Oceania Regional Office (IUCN-ORO)
- 4 Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

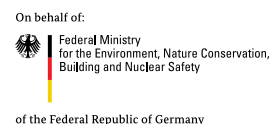
ACKNOWLEDGEMENTS

The authors would like to thank the Government of Vanuatu and, specifically, the Ocean Policy Implementation Committee (co-chaired by the Ministries of Foreign Affairs, International Cooperation and External Trade and of Climate Change Adaptation, Meteorology, GeoHazard, Environment and Energy) for their guidance and support. We would further like to acknowledge the marine experts of Vanuatu who kindly donated their time during and after the workshop to identify special, unique marine areas of Vanuatu.

This report is a product of the MACBIO project which is funded by the International Climate Initiative (IKI) of the German Federal Ministry for Environment, Nature Conservation and Nuclear Safety (BMU). It is being implemented by the German Agency for International Cooperation (GIZ) and the Government of Vanuatu in close collaboration with the Secretariat of the Pacific Regional Environment Programme (SPREP) and with technical support from the International Union for Conservation of Nature's Oceania Regional Office (IUCN-ORO). Some additional funding support was provided by the Oceans 5.

© MACBIO 2018

All MACBIO Project partners including the Secretariat of the Pacific Regional Environment Programme (SPREP), the International Union for Conservation of Nature (IUCN) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) are the inherent copyright owners of this publication. Reproduction of this publication for educational or other non-commercial uses is authorized without prior written permission from the copyright holder(s) provided the source is fully acknowledged. Reproduction of this publication for resale or other commercial purposes is prohibited without prior written permission of the copyright holder(s). The designation of geographical entities in this publication, and the presentation of the material do not imply the expression of any opinion whatsoever on the part of SPREP, IUCN, GIZ or the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) concerning the legal status of any country, territory, or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries. This document has been produced with funds provided by the International Climate Initiative (IKI). BMU supports this initiative on the basis of a decision adopted by the German Bundestag. The views expressed herein should not be taken, in any way, to reflect the official opinion of the Federal Government of Germany.



CONTENTS

Acknowledgements	iv
Acronyms	vi
Executive Summary	1
1. Introduction	3
1.1 Background	3
1.2 Report context	3
1.3 Report purpose and outline	4
2. Methods	5
2.1 Data gathering	5
2.2 Workshop and additional consultations	5
2.3 Rating of Vanuatu's special, unique marine areas	6
2.4 Overall prioritisation	8
2.5 Layout of site information in report	8
3. Results	9
3.1 Offshore biophysically special, unique marine areas	9
3.1.1 Offshore: Northern Region	10
3.1.2 Offshore: Central Region	18
3.1.3 Offshore: Southern Region	23
3.2 Inshore biophysically special, unique marine areas	34
3.2.1 Inshore: Torba Province: Torres Group	35
3.2.2 Inshore: Torba Province: Banks Group	42
3.2.3 Inshore: Sanma Province: Espiritu Santo Island	50
3.2.4 Inshore: Sanma Province: Malo Island	59
3.2.5 Inshore: Penama Province, Maewo Island	62
3.2.6 Inshore: Penama Province, Ambae Island	65
3.2.7 Inshore: Penama Province, Pentecost Island	68
3.2.8 Inshore: Malampa Province, Malekula Island	72
3.2.9 Inshore: Malampa Province, Ambrym Island	89
3.2.10 Inshore: Malampa Province, Paama Island	93
3.2.11 Inshore: Shefa Province, Epi Island	94
3.2.12 Inshore: Shefa Province, Tongoa Island	102
3.2.13 Inshore: Shefa Province, Emae Island	108
3.2.14 Inshore: Shefa Province, Makira Island	116
3.2.15 Inshore: Shefa Province, Mataso Island	119
3.2.16 Inshore: Shefa Province, Efate Island	123
3.2.17 Inshore: Tafea Province: Tanna Island	159
3.2.18 Inshore: Tafea Province: Erromango Island	163
3.2.19 Inshore: Tafea Province: Aniwa Island	164
3.2.20 Inshore: Tafea Province: Futuna Island	166
3.2.21 Inshore: Tafea Province: Aneityum Island	167
4. Discussion	169
5. References	173
6. Appendices	181

ACRONYMS

CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species
CMS	Convention on Migratory Species
EBSA	Ecologically or Biologically Significant Marine Areas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IBA	Important Bird Areas
ICM	Integrated Coastal Zone Management
IUCN	International Union for the Conservation of Nature
KBA	Key Biodiversity Area
LMMA	Locally Managed Marine Area
MACBIO	Marine and Coastal Biodiversity Management in Pacific Island countries project
MPA	Marine Protected Area
MSP	Marine Spatial Planning
NBSAP	National Biodiversity Strategy and Action Plan
NOAA	National Oceanic and Atmospheric Administration
ORO	Oceania Regional Office
SPREP	Secretariat of the Pacific Regional Environment Programme
SUMA	Special and / or unique marine area
TWG	Technical Working Group
UNESCO	United Nations Educational, Scientific and Cultural Organization
USP	University of the South Pacific
WCPFC	Western and Central Pacific Fisheries Commission

EXECUTIVE SUMMARY

In 2014, the Vanuatu Council of Ministers (Decision No. 172/2014) supported the development of a national ocean policy and marine spatial plan, and in doing so, established an Ocean Policy Subcommittee to guide these processes. Now, as the Ocean Policy Implementation Sub-Committee, one of their tasks was to identify Vanuatu's special and/or unique marine areas (SUMAs). This report brings together data, literature and the outputs of a dedicated workshop synthesising information about the areas identified. The areas were described, justified and scored according to four criteria: geographic explicitness, justification, information sources and legal obligations associated with each site. Each site was described in as much detail as the available information sources allowed, and was given a score out of 12. Sites were grouped into large-scale, offshore sites and finer-scale, mainly inshore sites; the former were grouped into broad geographic regions (southern, central and northern) and the latter were grouped into Provinces. Workshop participants identified 100 SUMAs, of which 11 were offshore and 89 were inshore.

There was a large range of scores for the offshore sites, from 5 to 12; most sites received intermediate scores. The lowest-scoring sites suffered from a lack of information and clear boundaries, and it was therefore also difficult to determine obligations to protect attributes or components of these sites. The highest-scoring site (Vanuatu Trench, with a score of 12) can be considered truly unique, both in a national and global context. A clear site boundary and good background information are important for spatial planning.

Among the finer-scale inshore sites, the five highest-scoring sites (12) were Palekula to Turtle Bay, Crab Bay, Lamén and Rovo Bays and Kakula. This was the result of a combination of factors: they were geographically clearly defined, there was high-quality information directly relevant to the sites, the attributes of the sites were clearly special, and in some cases the sites have already been recognised for their special attributes through various forms of protection. Low-scoring sites (4–5) were those that had been selected for a single specific organism or attribute, or those for which very little information was available.

Some of the sites were given a special and/or unique status because of their remoteness. Furthermore, many sites have three highly valuable ecosystems in close proximity (coral reefs, mangroves and seagrass beds), which, due to the number of organisms that use all three habitats at different times in their life cycle, would confer a higher value to each individual habitat. Other sites include steep depth gradients that bring oceanic attributes close to productive coastal environments. This points to the importance of considering multiple adjacent habitats for inclusion in cohesive protected areas.

Both high and low scores are useful for management; high-scoring sites can be prioritised with confidence, while lower-scoring sites can be targeted with more research or protected. Future scoring systems may take into account levels of human use or impact, as this affects the intrinsic ecological value of a habitat, assemblage, population or ecosystem. The identification and scoring of SUMAs can guide the next steps in marine spatial planning, but also inform other management measures (e.g. permit or licencing decisions) or environmental impact assessments (EIAs) that may be relevant to these locations.



1. INTRODUCTION

1.1 BACKGROUND

In 2014, the Council of Ministers (Decision No. 172/2014) decided to start implementation of, amongst other things, an Ocean Policy and a Marine Spatial Plan for the nation. The Government then established the Ocean Policy Sub-Committee of the National Committee on Maritime Boundary Delimitation (in the Ministry of Foreign Affairs, International Cooperation and External Trade) to guide these processes. In April 2017, the Government of Vanuatu launched the Pacific's first national Ocean Policy after it had passed through cabinet in August 2016. In June 2017, Vanuatu attended the United Nations Oceans Conference (UNOC) in New York and shared internationally its commitment to 1) a National Oceans Office by 2020, 2) a National Marine Spatial Plan by 2020, and 3) a national network of Marine Protected Areas by 2020 – these all being commitments within the Ocean Policy. The government consequently reformulated the Ocean Policy Sub-Committee into an Ocean Policy Implementation Sub-Committee. These are a sub-committee of the National Committee on Maritime Boundary Delimitation, Vanuatu's default high-level committee which attends to the entire suite of ocean matters.

The Ocean Policy Implementation Sub-Committee is co-chaired by the Ministries of Foreign Affairs, International Cooperation and External Trade and of Climate Change Adaptation, Meteorology, GeoHazard, Environment and Energy. It comprises of the eight key Ministries with responsibilities regarding use, development and management of Vanuatu's ocean, plus representatives from the National Malvatumauri Council of Chiefs and the office of the Prime Minister. This Ocean Policy Implementation Sub-Committee has, as one of their tasks, to identify Vanuatu's special and/or unique marine areas (SUMAs). This report presents the results of this government effort.

1.2 REPORT CONTEXT

The following marine spatial planning process for Vanuatu is underway, under the guidance of the Ocean Policy Implementation Sub-Committee. The outcomes of task No. 6 (below, in bold) are described in this report.

Legal review – completed	2015
Develop draft Ocean mgt objectives – completed	2015
Finalise Ocean Policy – completed	2016
Build consultation/communication plan	mid 2017
Build draft zone typology	mid 2017
Identify biologically special or unique areas	end 2017
Develop biophysical description of Vanuatu's ocean	early 2018
Design zone placement guidelines	early 2018
Public consultation – what kinds of uses/protection where?	2018
Draft marine spatial plan	late 2018
Preparation for consultation	late 2018
National/public consultation on draft spatial plan	2019
Revise and finalise draft spatial plan	late 2019
Informal consultation within government/stakeholders	late 2019
Formal Government Gazette	2020
Inform public of new Ocean Plan	2020

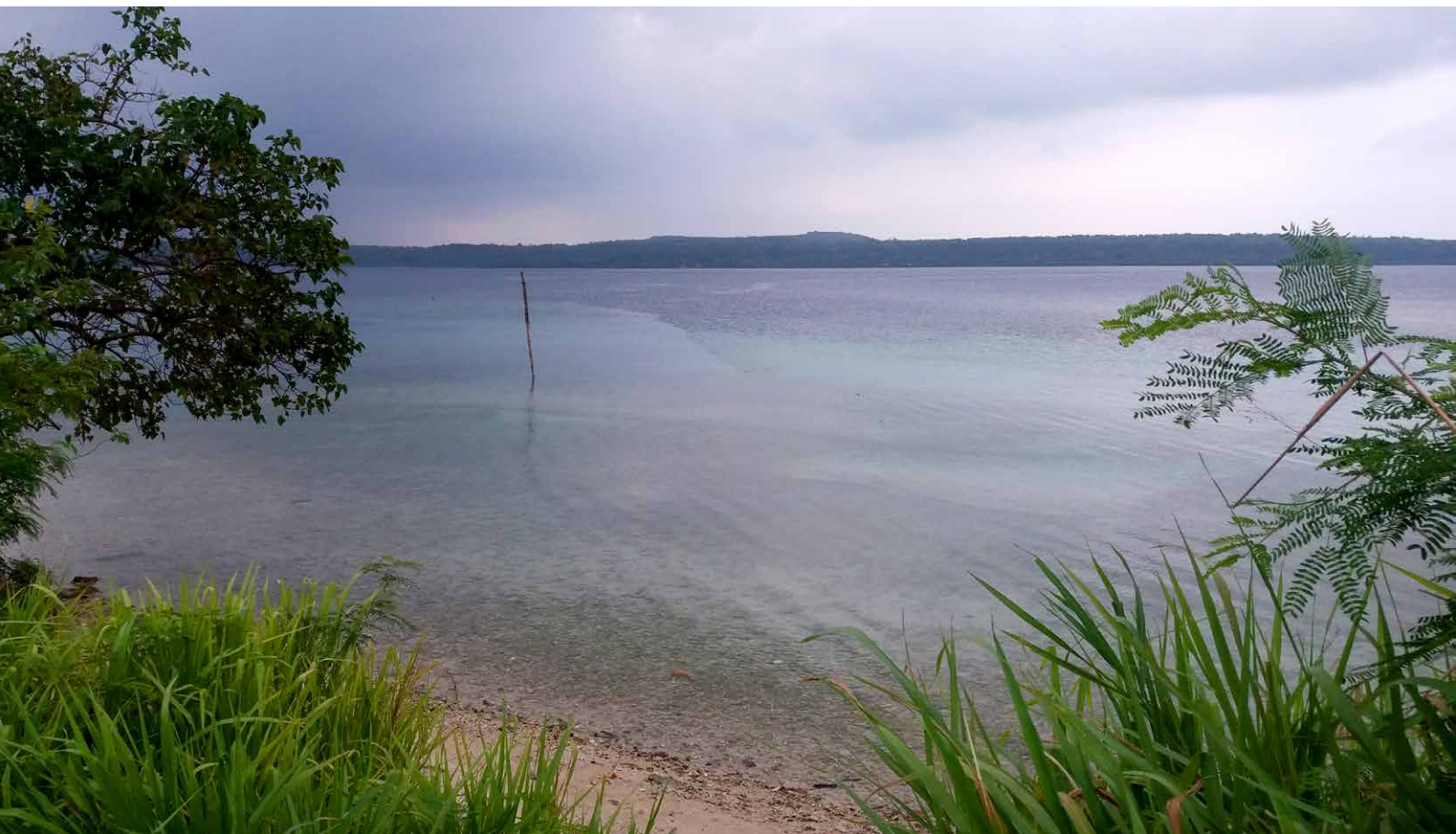
The Cabinet endorsed both the Ocean Policy, its implementation and the support of the Marine and Coastal Biodiversity Management in Pacific Island Countries (MACBIO) project for same (see Cabinet decisions 172/2014, 166/2016). The MACBIO project aims to strengthen marine and coastal biodiversity management in Pacific Island countries such as Vanuatu. In particular, it can support ocean-wide marine spatial planning. MACBIO is funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety's (BMU's) International Climate Initiative (IKI). It is being implemented by the German Agency for International Development (GIZ) with the countries of Fiji, Kiribati, Solomon Islands, Tonga and Vanuatu. It has technical support from the Oceania Office of the International Union for the Conservation of Nature (IUCN-ORO) and is working in close collaboration with the Secretariat of the Pacific Regional Environment Program (SPREP).

1.3 REPORT PURPOSE AND OUTLINE

Vanuatu is developing and its ocean is coming under increasing pressure from multiple uses and external stressors, including climate change. Describing the nation's special, unique marine places can be used in government (and other) decision-making about how best to use Vanuatu's marine environment. Biophysically Special, Unique Marine Areas (SUMAs) should be considered in, for example, licence and permitting decisions, Environmental Impact Assessments and marine spatial planning, including for marine protected areas and Community Conservation Areas.

Recognising this, on 25 October 2017, the Government of Vanuatu, through the Ocean Policy Implementation Committee's co-chairs, supported by MACBIO, hosted a technical workshop to define biophysically Special, Unique Marine Areas (SUMA) of Vanuatu. This report describes the preparations that preceded the workshop, the outcomes of that workshop, and follow-up research recommended during the workshop.

The report also outlines the methods used to identify and describe the sites and the resulting list of biophysically special, unique marine areas of Vanuatu. The sites are categorized as either being "offshore" or associated with an island group ("inshore").



2. METHODS

The technical, expert workshop held aimed to identify SUMAs in Vanuatu. Therefore, it explicitly focussed only upon the marine environment. Vanuatu has many very important and special terrestrial sites, but these were not the purpose of this workshop and the data and expertise required to identify special, unique terrestrial areas were not available in this marine workshop.

2.1 DATA GATHERING

The Government of Vanuatu, together with the MACBIO project team, had spent three years collating, assessing, preparing and mapping open source and freely available data on, amongst other things, the special and/or unique marine features of Vanuatu. The data available for use at the workshop, both in electronic and hardcopy format, are listed in Appendix 1. In total, there were 41 datasets available for use in the workshop, of which 24 were related to biodiversity and 17 were related to environmental variables only. All were available electronically and some as hardcopy maps. All the data have been stored with associated metadata using the ANZMEt Lite (www.anzlic.gov.au/resources/metadata) standard and have been delivered to all interested parties, including Government Departments, in Vanuatu. These data and maps can also be accessed via the MACBIO website (<http://macbio-pacific.info/>).

2.2 WORKSHOP AND ADDITIONAL CONSULTATIONS

Workshop participants were chosen based upon their expertise and are listed in Appendix 2. These participants (and other contributors) have marine expertise to do with one or more of the following: inshore and offshore fish and other species, marine habitats and environments, high biodiversity areas, whale areas, hydrology, findings from deep sea mineral explorations, oceanography, fisheries and marine research.

The workshop agenda is presented in Appendix 3. Participants were asked to define marine areas for Vanuatu that were biologically and/or physically special or unique. In addition to the data described above, participants were provided with worksheets to complete for each site identified (Appendix 4) as well as maps of Vanuatu at roughly three scales: ocean-wide (1: 3.1 million scale), large-scale island group maps that were divided into five “strips” from top to bottom with one island group per strip but that included adjacent waters out to the provisional Exclusive Economic Zone (EEZ) boundary (scales from 1: 2 million to 1: 1 million), plus other hardcopy maps which “zoomed in” on each island group (roughly at scales from 1: 300 000 to 1: 11 000) (for full list of response maps see Appendix 4). These were for participants to mark the geographic boundaries of the sites they had identified.

The workshop required participants to provide, per site they identified:

- A site name;
- A geographic description of the site’s location and boundaries;
- A justification. This may include information as to whether areas support, or are likely to support, rare, vulnerable or unusual habitats or species, threatened species, important life stages of key species, endemic species, physically or biologically outstanding attributes (e.g. unique geomorphology, high species diversity or high productivity);
- Sources. These could be peer reviewed scientific papers, peer reviewed reports, other reports, data or personal communications from participants or other expert sources;
- Legal or other obligations to protect the site or species within the site;
- Follow-up tasks required to finalise description of the site.

The participants were divided into three groups to make decisions about what they considered biophysically special and/or unique sites for Vanuatu. Each group had available: the electronic data on a GIS with a screen and GIS technician to

access and map any data they wished to view, a facilitator, hard copy maps, worksheets and response maps upon which to draw their chosen sites. Each group also nominated a rapporteur. At the end of the workshop, each group presented their findings to a plenary session.

The final report accessed any additional research, data and information to both inform the descriptions of the sites identified in the workshop, and considered any additional sites that the workshop had not identified, especially in offshore areas. This involved following up on potential sources of information, including experts who were not able to attend the workshop. Information was collected through online libraries that linked to peer-reviewed journals and online “grey” (or unpublished) literature, including that accessed through experts and government departments in Vanuatu. Species-specific obligations were supplemented by compiling a list of species occurring in Vanuatu waters that are listed in national and international conservation legislation (Appendix 5).

All spatial data and information collected during the workshop were digitized and a map of each identified SUMA was created. A geographic boundary for each site was created in GIS from the minimum bounding geometry enclosing each site. The diagonal coordinates (latitudes/longitudes) generated from this process were used to identify the geographic boundaries for the SUMAs of Vanuatu. Whilst the maps created here are as accurate as possible, it is very likely that, as further information is gathered, the boundaries of the actual sites may need to be altered.

2.3 RATING OF VANUATU’S SPECIAL, UNIQUE MARINE AREAS

Vanuatu has a vast range of marine biophysical features, some which are well known and understood, some which are special, some of which are unique and some of which may require special consideration when planning forward for the optimal use and management of Vanuatu’s ocean. There is not equal justification for, or information about, the special, unique sites identified during the workshop and in this report. Data from the workshop and other sources were used to systematically assess each site against the following criteria:

- a. **Geographic explicitness** – how well-defined and well-justified the boundaries of the site are. All sites identified exclude land above the high-water mark. For example, if a site demarcates a ring around a fringing reef of an island (e.g. Mystery Island), then the marine special, unique site indicated includes the entire marine environment within that ring up to high water mark but does not include the island itself.
- b. **Amount, detail and nature of justification** (including whether there is clear, abundant and convincing information to indicate whether the area is likely to support rare, vulnerable or unusual habitats or species, threatened species, endemic species, important life stages of key species, or physically or biologically outstanding attributes e.g. unique geomorphology, high species diversity or high productivity). If the information provided is only generic to the type of site being described, and not specific to the site/s located in Vanuatu, then the score under the criterion “Justification” will be diminished by ½ to a whole of a point. A ½ point will be subtracted from the score it might otherwise have received if the site is one where, globally, there’s not much information (e.g. many offshore, deeper water sites). A full point will also be subtracted if, globally, there is a wealth of information and so the chances of having site-specific information are greater (e.g. coral reefs).
- c. **Information source(s)** – how reliable and verifiable the information source(s) are, and how many of them are available. Information is more likely to be correct and can be cross-referenced and triangulated if multiple information sources are used. All the sites will have at least one, locally specific, expert source, namely, one of the workshop participants; some have more expert sources. Aside from this, for the offshore, deeper water sites it is well understood that data, globally, are sparse and thus, for these sites, generic sources may be considered to count as sources in this criterion. For globally well studied habitats, such as coral reefs or mangroves, for which there are literally thousands of global “sources”, only locally specific sources contribute to this criterion. Aside from these caveats, more and more reliable and verifiable information sources meant a higher score for this criterion.
- d. **National or international obligations** – this is relevant to areas associated with species or habitats for which the country has international obligations (e.g. under Conventions) or national obligations (e.g. under law).

Expert information and other sources were used to rate proposed special, unique sites. Scoring ranged from relatively low (1), to medium (2) or high (3) against each of the four criteria. Special and/or unique areas scoring highly against all criteria ranked more highly overall. This meant that these sites had better and more reliable descriptions and were also likely to be relevant to the country's existing environmental protection obligations. If scoring highly against just some of the criteria, they were nominated as medium-level special or unique areas. If scoring poorly against all criteria, areas were not identified as special or unique for planning purposes.

The scoring system used is described in the table below. Three points are allocated as the top "score" for each of the four criteria (justification, geographic explicitness, source – including both type and number of sources – and national and international obligations that pertain to the site). The highest score possible is 12.

Geographic Explicitness	
1	Boundaries are quite loosely defined
2	Boundaries broadly match the features
3	Boundaries exactly match the biophysical features identified as important
Justification	
1	One or two reasons (e.g. presence of organisms) justifying the site, with generic information sources
1 ½	One or two reasons (e.g. presence of organisms) justifying the site, with site-specific information sources
2	Three or four reasons justifying the site, with generic information sources
2 ½	Three or four reasons justifying the site, with site-specific information sources / five or more reasons justifying the site, with generic information sources
3	Five or more reasons justifying the site, with site-specific information sources
Source	
Source Type	
½	Only expert advice from workshop participants
1	No peer reviewed papers are available but there are good reports available
1 ½	At least one peer reviewed scientific paper or report discusses this site (for inshore sites) – or, for offshore sites, good generic sources describing the main feature(s) of the site
Source Number	
½	One source (in addition to the workshop experts)
1	Two to three sources
1 ½	Four or more sources
International/ National Obligations	
1	One species / habitat with obligations
2	Two or three species/habitats
3	More than three species/habitat with obligations

2.4 OVERALL PRIORITISATION

The ratings of the criteria were added up to give an overall score out of 12. A higher score means a site has a higher rating.

2.5 LAYOUT OF SITE INFORMATION IN REPORT

For each SUMA identified in the workshop, we provide, in this report, the following information: a site name; if it is a lesser known type of habitat, we provide a broad definition of the habitat; a map; a summary table with the name and score of the site; the diagonal coordinates (latitudes/longitudes; see Section 5.2 for details); a geographic description; a descriptive justification for the inclusion of the site; relevant references; the number and type of sources used; and the international and national obligations pertaining to the SUMA and its key attributes.

The maps prepared attempt to portray the SUMA as accurately as possible. However, perfect data (e.g. on the location of reefs, pinnacles, mangroves, seagrass etc.) are unavailable. If the identified site is known to local experts to have different or more extended boundaries, then these boundaries should be used in lieu of the boundaries as portrayed in this report.



3. RESULTS

This section provides information on all the SUMAs for Vanuatu identified during the expert workshop on 25 October 2017 and during follow-up research.

3.1 OFFSHORE BIOPHYSICALLY SPECIAL, UNIQUE MARINE AREAS

All the offshore SUMAs within the Vanuatu EEZ are depicted in the figure below.

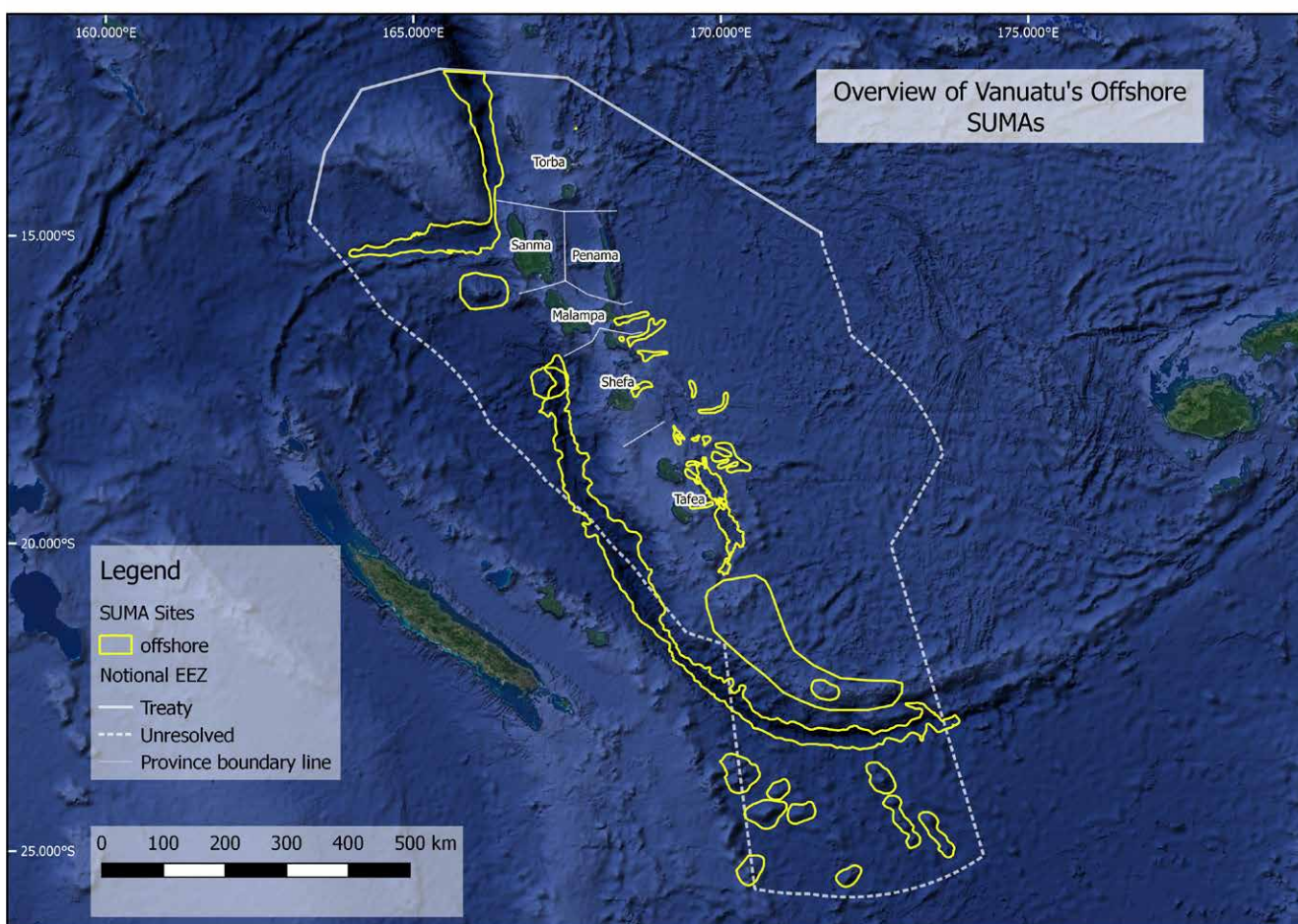


FIGURE 1. Overview of Vanuatu's offshore SUMA sites.

3.1.1 Offshore: Northern Region

3.1.1.1 SITE NO1: NORTHWEST PART OF SANTO

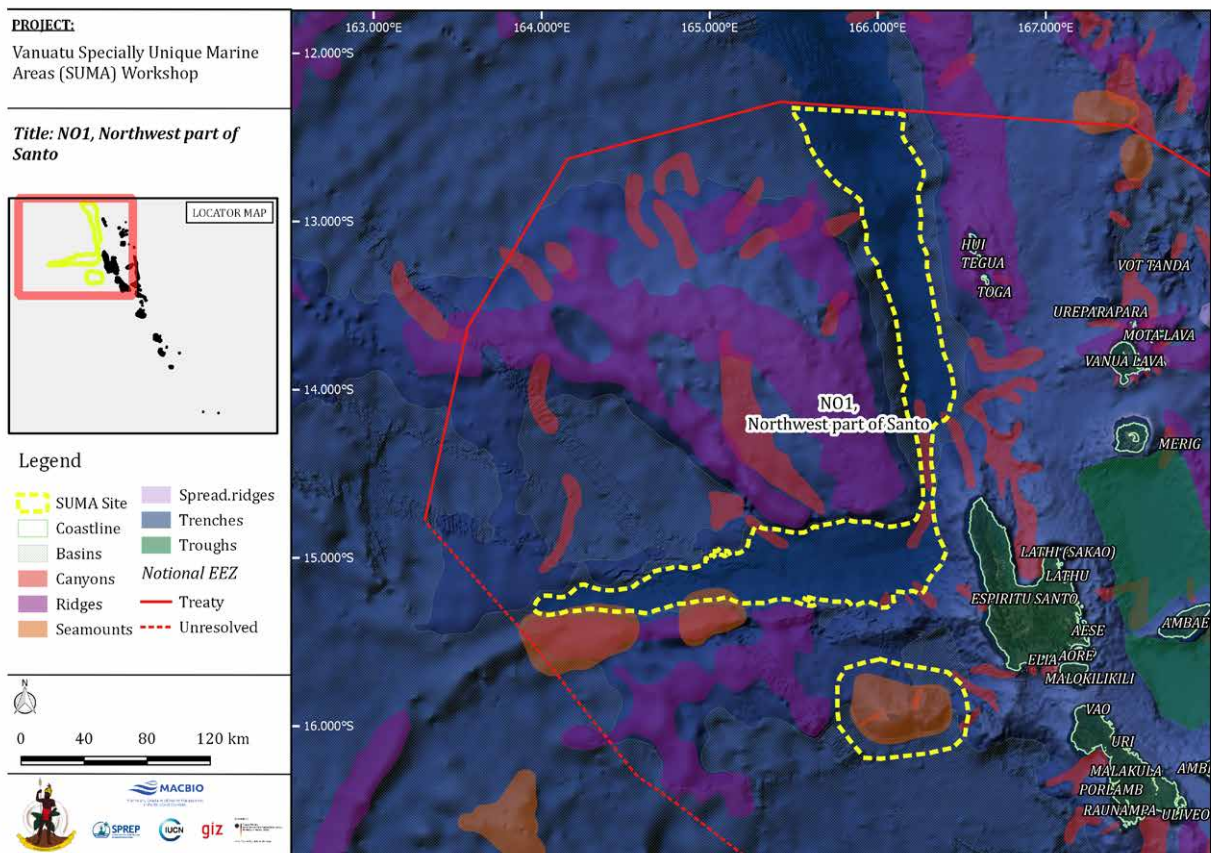


FIGURE 2. SITE NO1: Northwest part of Santo

TABLE 1. SITE NO1: Northwest part of Santo. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Score
Offshore SUMA – Northern region	Northwest part of Santo	NO1	8.5

Geographic boundaries

15.3121°S 163.9452°E, 13.1036°S 167.828°E

Geographic description (score = 1)

This SUMA consists of a large area to the northwest of Espiritu Santo Island. The SUMA includes the d’Entrecasteaux Ridge, part of the West Santo Basin and their intersection with the Vanuatu Trench. The boundaries of the SUMA closely follow those of these features and include the water column above them.

Justification (score = 2.5)

This SUMA was selected due to its prominent undersea features (trenches and seamounts) and its high abundance of fish stocks, which usually indicates an area of high biological productivity; modelling shows very high photosynthetically available radiation in this area (NASA 2018a). The prominent features of this SUMA are the eastern end of the d’Entrecasteaux Ridge and its collision point with the Vanuatu island arc (Fisher et al. 1991; Collot et al. 1992). The d’Entrecasteaux Ridge is a double oceanic ridge that forms the northern extension of the New Caledonia–Loyalty

Islands arc, and is actively subducting under the Vanuatu or New Hebrides arc (Hanuš and Vaněk 1983). Subduction zones are the most tectonically active regions on the planet, frequently causing earthquakes and associated with active volcanoes; this area is among the most active on the planet (Baillard et al. 2015). This has resulted in a large number of tectonic studies and detailed geophysical descriptions of this area (Collot and Fisher 1992; Mortimer et al. 2014), but its biology and ecology remain poorly understood. However, the geomorphic features of the SUMA are likely to be, at least partially, driving high productivity in the pelagic waters above, as found by numerous studies of long, narrow, steep-sided depressions in the ocean floor (Moors-Murphy 2014; Bouchet et al. 2017; Fernandez-Arcaya et al. 2017).

Deep-sea trenches are long, narrow, steep-sided depressions in the ocean floor in which the maximum oceanic depths occur, approximately 7,300 to over 11,000 m. They typically form in locations where one tectonic plate subducts under another (IHO 2008). The interaction between water masses and sediments in these geologically highly active environments can create mud volcanoes or seeps. These are often associated with chemosynthetic communities, which thrive where cold fluids seep out of the forearc. Cold seep communities have been discovered in inner trench slopes down to depths of 7,000 m in the western Pacific (Van Dover et al. 2012).

This SUMA also includes the North Vanuatu Trench. Submarine depressions such as canyons and trenches are major conduits of terrestrial and marine sediments into the food-deprived deep sea (Harris and Whiteway 2011). Unique benthic communities form inside the slopes of trenches, with different functional groups dominating at different depths and affected by internal tides, food availability and substratum characteristics (Liao et al. 2017). Canyon heads or the ends of trenches usually have the highest benthic standing stocks among the major habitats on the deepwater continental or plateau margins, due to an accumulation of organic matter (Wei et al. 2012). These factors create a number of different trophic environments, and a food web study concluded that submarine canyons, which share many features with larger and deeper trenches, may represent important havens of trophic diversity (Demopoulos et al. 2017; Fernandez-Arcaya et al. 2017). The deep waters in and around the Vanuatu Trench are thought to be of intermediate productivity (Linley et al. 2017).

Ecological studies conducted further south, in the Vanuatu Trench from 2,000 to 6,948 m deep, found that amphipod assemblages changed between abyssal, bathyal and hadal¹ depths, and were correlated with changes in hydrostatic pressure and particulate organic carbon flux (Lacey et al. 2016). These environmental conditions may also have limited the depth of deep-dwelling fishes, such as grenadiers or rattails (Macrouridae) (Linley et al. 2016), which were notably absent from abyssal and hadal depths of the Vanuatu Trench (Linley et al. 2017). Amphipod species richness at these depths tended to peak between 4,000 and 5,000m (Lacey et al. 2016). Some of these features are almost certainly also present in this SUMA (NO1).

The workshop also identified this SUMA as an area with seamounts; online databases show seamounts with peaks at bathyal depths in the far western corner of the SUMA (Blue Habitats 2018). Seamounts are “a discrete (or group of) large isolated elevation(s), greater than 1,000m in relief above the sea floor, characteristically of conical form” (IHO 2008). Hills on the seabed at abyssal depths having peaks that rise >300 to <1,000 m above the seafloor and were mapped as abyssal hills (Harris et al. 2014). Many southwest Pacific seamounts have peaks or slopes within the depth range of the deep scattering layer (DSL). The DSL has a mix of zooplankton (such as shrimps, euphausiids, and copepods), mesopelagic fish (such as lanternfish) and small squid that migrate vertically upwards at night and downwards during the day. Where the DSL makes contact with the seamount summit and upper flanks, there is a zone of interaction between pelagic and benthic ecosystems. Other seamounts extend into the photic zone, where light penetration allows growth or aggregation of light-dependent organisms (Baker and Beaudoin 2013).

Seamounts usually have steep slopes which can cause the upward movement of nutrients from the deep ocean (upwellings) and create “hotspots” of biodiversity and productivity (Morato et al. 2010; Dunstan et al. 2011). They often attract deepwater and pelagic species such as tuna, deep-water snapper, sharks, whales and dolphins (Stone et al. 2004; Morato and Clark 2007; Baker and Beaudoin 2013). Telemetry studies have shown high levels of individual fidelity to specific sites, such as seamounts, by highly migratory marine species (e.g. humpback whales), and basin-wide movements of these animals can be directed towards these locations (Garrigue et al. 2010; Luschi 2013).

Harris et al. (2014) has classified the seamounts of the world based upon at least some of the physical parameters likely to determine the nature and diversity of species inhabiting them (e.g. depth of seamount base and summit, slope, size, height above seabed, shape of summit, etc). Globally, 11 types of seamounts occur (Harris et al. 2014). The seamounts of this SUMA are classified as Group 2: large and tall with shallow peak: shallow (1 seamount), Group 3: intermediate

¹ Bathyal: 1,000–4,000m; abyssal: 4,000–6,000m; hadal: >6,000m, only found in trenches.

size, largest basal area and deepest peak depth (2 seamounts) and Group 4: small with deep peak, most common type (1 seamount) (Harris 2014), and are likely to be biodiversity and productivity hotspots.

Many seamounts exhibit a positive biological cascade effect, where the elevated levels of primary productivity and higher concentrations of zooplankton support high abundance of benthic fauna and consequently large populations at higher trophic levels including pelagic, demersal and benthic species (Stone et al. 2004). Benthic taxa living on seamounts can include biogenic habitat-forming corals and sponges, anemones, crabs, sea stars, sea urchins, brittle stars, sea cucumbers and feather stars (Rogers 2004; CSIRO 2008; Clark et al. 2011; Baker and Beaudoin 2013). Modelling of benthic species richness (www.aquamaps.org) indicates that this SUMA is among the areas with the highest benthic species richness (550–950 species) (AquaMaps 2014a).

The deepwater seamount communities often have a high level of endemism, and are likely to have different fauna on the leeward and windward sides (Stone et al. 2004; Dunstan et al. 2011; Marchese 2014). Species may be restricted to a chain of seamounts, to a few adjacent seamounts or even to a single seamount (Stone et al. 2004). Rates of endemism vary, from a low of 5–9% up to 52% (Stone et al. 2004). Richer de Forges et al. (2000) found that adjacent seamounts in New Caledonia shared only 21% of species; and seamounts approximately 1,000 km apart shared only 4% of species. Work by Koslow et al. (2001) and Rowden et al. (2002) (both in Stone et al. (2004)) showed that even relatively small underwater hills (100 to 400m above the seafloor) had rates of endemism of 15 to 35%. However, it is not necessary for seamounts and seamount-like features (e.g. ridges) to be isolated or large to support high levels of endemism. Among non-endemic species, research has shown genetic connectivity in animals (e.g. tuna and other fish) between seamounts, and between seamounts and nearby non-seamount areas (Stone et al. 2004). This indicates that some populations of animals found on seamounts are unlikely to be self-sustaining, and may rely on long-range larval dispersal and adult movement (Ayre and Hughes 2004).

How biodiversity, including endemism, varies on seamounts, ridges and hills with parameters such as depth, surface productivity, temperature, substrate composition, organic flux to the seafloor, currents, oxygen level, latitude and other factors is poorly understood and not highly predictable (Stone et al. 2004; Baker and Beaudoin 2013). Species new to science continue to be discovered each time seamounts are sampled and, due to the longevity of many of those species, they may provide valuable information regarding the workings of the ocean and the source of some parts of life on Earth (Stone et al. 2004; CSIRO 2008).

See a video on seamounts here: <https://www.youtube.com/watch?v=0NUaxdxt2sE>

See pictures from seamounts here: <http://ngm.nationalgeographic.com/2012/09/seamounts/interactive-gallery>

Aggregations of tuna are attracted to the high productivity typical of waters above seamounts, as evidenced by longline and pole-and-line fishing vessels, which often target them specifically (Passfield and Gilman 2010). The main species of pelagic fish known to occur in Vanuatu's EEZ are albacore (*Thunnus alalunga*), bigeye (*Thunnus obesus*), skipjack (*Katsuwonus pelamis*) and yellowfin tuna (*Thunnus albacares*) (Brouwer et al. 2017). The Sea Around Us project and fisheries reports show that this SUMA, especially its westernmost corner, supports relatively high biomass of albacore, yellowfin and bigeye tuna (Sea Around Us Project 2016a). The deep waters of Vanuatu in general, including the areas around this SUMA, especially the seamounts, have the potential for high densities of deep-sea snappers of the genera *Etelis*, *Pristipomoides* and *Aphareus*, according to distribution modelling (Gomez et al. 2015).

Type and number of sources (score = 2)

Despite the high level of interest in this SUMA from a geophysical perspective, very little specific information is available about its ecology and biology. The special, unique nature of the SUMA had to be inferred from more general knowledge. Five peer-reviewed papers described the geology and geomorphology of the SUMA, one map shows modelled productivity, and we used over 25 general peer-reviewed papers and reports to collate information that could be relevant to the SUMA. Three peer-reviewed papers and two reports contained information from the vicinity of the SUMA that could be used for the justification.

Obligations (score = 3)

The Fisheries Management Act 2014 outlines obligations for the protection and sustainable use of fish stocks, including pelagic, demersal and deep-water species. The IUCN Red list includes the four species of tuna that aggregate at the site: skipjack tuna are listed as Least Concern, yellowfin and albacore tuna are Near Threatened and bigeye tuna are Vulnerable. Stock assessments suggest that albacore is not overfished, but there has been a decline in abundance in recent years; yellowfin tuna is being fished very close to capacity (Brouwer et al. 2017). There are obligations to protect and sustainably manage many fish species, including some associated with seamounts and trenches, within the

Environmental Protection and Conservation Act [CAP 283], Fisheries Management Act 2014 and subordinate regulations, including terms and conditions associated with licenses. Marine mammals, some sharks and some large predatory fishes found around seamounts are on the IUCN Red List of Threatened Species and listed under the Vanuatu International Trade (Flora and Fauna) Act 1962, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

3.1.1.2 SITE NO2: EAST EPI

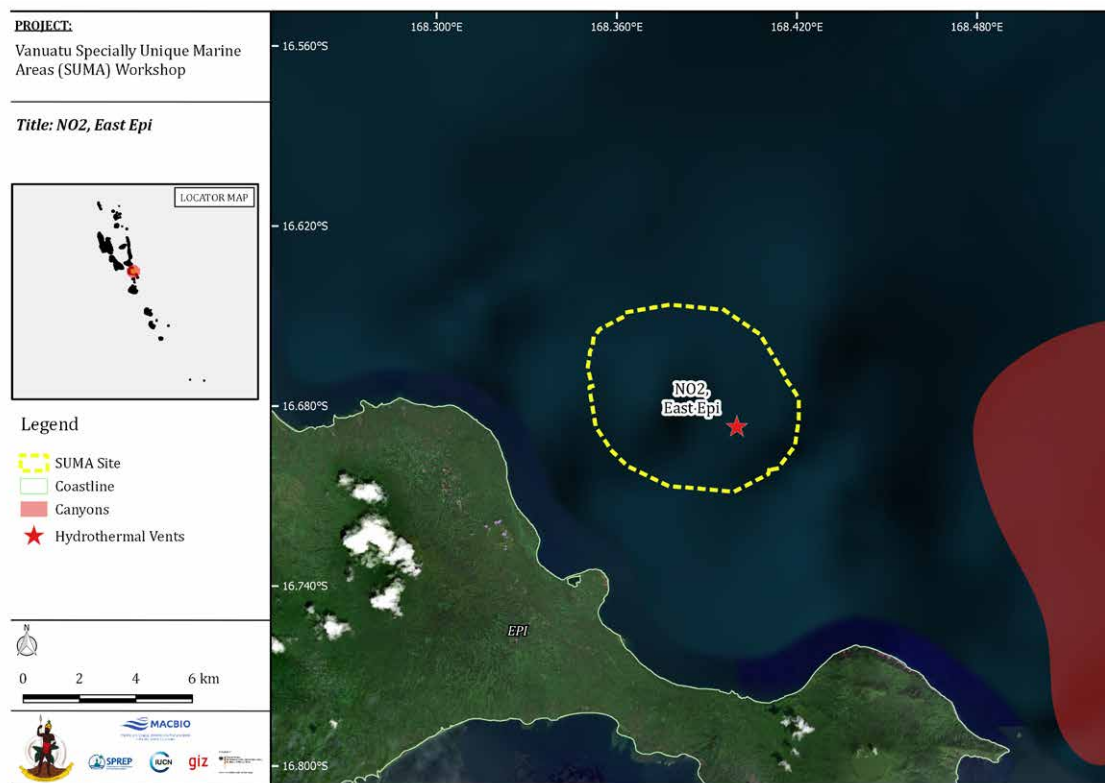


FIGURE 3. SITE NO2: East Epi

TABLE 2. SITE NO2: East Epi. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Offshore SUMA – Northern region	East Epi	NO2	9.5

Geographic boundaries

16.644°S 168.3523°E, 16.7103°S 168.4184°E

Geographic description (score = 2.5)

This SUMA includes a small area in deep waters east of Epi Island, in the Shefa Province, where there is a submarine volcano, hydrothermal vents and seamounts. The SUMA includes the caldera, associated volcanic cones, and a stretch of deep water of at least 2 km on each side.

Justification (score = 2)

Geological and geophysical surveys described this SUMA as hosting an active submarine volcano with three cones (Epi A, Epi B and Epi C) arranged approximately 3.5 km apart, aligned east-west along the rim of a submerged caldera (Greene and Exon 1988). Epi B has a peak at ~34 m depth, while the other two peaks are deeper at around 220 m (McConachy and Binns 2001). The crater is roughly 150 m in diameter and 90 m deep, and open to the north (Futura Sciences 2015). The latest activity reported from this area was in 2004 (Global Volcanism Program 2004). The hydrothermal nature of the activity (McConachy and Binns 2001) provide habitat for chemosynthetic communities typical

of hydrothermal vents. A survey of the area, at a depth of approximately 300 m, found ferrous oxide (FeO₂) chimneys, diffuse venting, hydrothermal sediments, bacterial floc and some fauna in the simmering water (SOPAC 2014). There were deep-sea communities of crinoids, hexactinellid sponges, fishes and cold-water corals beyond the influence of the vents, and small vent communities, including mussel beds and some gastropods, near the vents. The gastropods were whelk species unassociated with vent systems, but they were preying on the vent-associated mussels (SOPAC 2014).

Generally, hydrothermal vents are the result of seawater percolating down through fissures in the ocean crust in the vicinity of spreading centres or subduction zones (places on Earth where two tectonic plates move away or towards one another) (NOAA 2016). The cold seawater is heated by hot magma and re-emerges to form the vents (NOAA 2016). Hydrothermal vent conditions can also develop around submarine volcanoes, as in this case (Tanaka and Yasuhara 2016).

Seawater in hydrothermal vents may reach temperatures of over 370° C (NOAA 2016). Hydrothermal vents have unique ecosystems which derive energy from volcanic gases rather than sunlight (<https://www.cbd.int/doc/meetings/mar/ebsaws-2014-01/other/ebsaws-2014-01-azores-brochure-en.pdf>, Accessed 5 October 2017). These areas are very productive, although small in spatial extent and relatively ephemeral – perhaps lasting some decades (Vrijenhoek 1997). The size of the vent communities is small due to reliance on the reach of the energy release from the volcanic activity (Vrijenhoek 1997). Their ephemeral nature is inherent due to the reliance upon that volcanic activity, which moves as the tectonic plates of the earth move, although new vents can arise in locations close to the previous vents (Vrijenhoek 1997). Therefore, whilst exact locations of extant hydrothermal vents may move, they will always be located at spreading centres or subduction zones – where magma meets the sea. Biomass is high and most of the animals are unique to the vent environments, and endemic to the specific area. Although they are confined to relatively small areas around the vents, they can attract, and be important to, species that live further afield (Vrijenhoek 1997; Little and Vrijenhoek 2003; Gollner et al. 2017). Different hydrothermal vents have also been shown to host different meio- and macrofaunal communities, depending on the specific environmental parameters (e.g. temperature, metal concentrations, concentrations of reduced chemicals, oxygen concentration, as well as level of variation in all of these parameters in space and time) (Gollner et al. 2015). Also, whilst macrofaunal species occur primarily at vents and are generally restricted to this habitat, meiofaunal species are distributed more widely and evenly across proximate and distant seafloor habitats, and are less restricted to vent habitats (Gollner et al. 2015).

New work shows ecological linkages between dead hydrothermal vents and the adjacent environment – indicating potentially essential connectivity between these and other deep-sea habitats (Klose et al. 2015). Hydrothermal vents have recently also been found to act as recycling and decomposition systems for dissolved organic carbon, an important constituent of the global carbon pool (Hawkes et al. 2015). If the vents are disturbed, this carbon could be released and entire ecosystems can be destroyed rapidly. Experiments carried out in both the Peru basin and the Clarion Clipperton Zone show that even though mobile species may return after disturbance, sessile species do not recover (Kaneko et al. 1997; ISA 1999; Bluhm 2001; Thiel et al. 2001; Gollner et al. 2017).

A video from a Pacific hydrothermal vent (albeit the eastern Pacific) is available here: <https://ocean.si.edu/ocean-videos/hydrothermal-vent-creatures>

Photos of hydrothermal vent animals are available here: http://deepseaphotography.com/downloads/category/hydrothermal_vent_animals.

Biota associated with the seamounts in this SUMA are likely to correspond to benthic, demersal and pelagic species commonly associated with seamounts more generally (see Site NO1: Northwest part of Santo for general information about seamounts); East Epi SUMA is likely to support significant biodiversity due to the extent and structural complexity of the overall seamount habitat it contains, and its proximity to an emergent island and associated shallow-water ecosystems nearby.

However, the biota associated with the active undersea volcanoes may be sparser, albeit relatively special. Active submarine volcanoes that have received scientific attention are Kavachi Volcano in the Solomon Islands (Phillips et al. 2016), Northwest Rota-1 (Chadwick et al. 2010), West Mata (Embley et al. 2014), El Hierro (Santana-Casiano et al. 2013), Kick'em Jenny (Wishner et al. 2005), and Axial Seamount (Xu and Lavelle 2017). Where biological information is available, it suggests unique ecosystems with communities forced to adapt to frequent catastrophic disturbances in the form of volcanic eruptions.

Active submarine volcanoes often host fauna typical of seamounts and hydrothermal vents, but their diversity is often related to the area of habitat available, the frequency of disruption by volcanic activity; the assemblage at any given time depends on the timing of the last eruption (Wishner et al. 2005). Usually these communities are composed of colonies of shrimps, limpets, and crabs; new species are routinely found (Chadwick et al. 2010). Workshop participants indicated that this SUMA was a likely hotspot of shrimp abundance; this could be driven by the hydrothermal activity. At least seven

species of deep-water shrimp occur in Vanuatu, mostly between 300 and 500 m (King 1981).

Knowledge about ecological communities on active undersea volcanoes is in its infancy; a biological survey of Kick'em Jenny (an active submarine volcano in the Caribbean) found a surprising benthic association of a number of shrimp species previously considered mesopelagic (Wishner et al. 2005). Vertically migrating pelagic organisms may 'bump into' seamounts and undersea volcanoes during their daytime descent, providing food for the seamount community; vertically migrating fishes and zooplankton resident on the seamount may rise at night to feed on plankton (Genin 2004). Like seamounts, undersea volcanoes can significantly affect hydrodynamics, entraining pelagic organisms or directing current flow in specific directions (Xu and Lavelle 2017). In 2015, an expedition to film the inside of Kavachi crater in the Solomon Islands recorded chemosynthetic bacteria, reef fish, larvaceans, a sixgill stingray (*Hexatrygon bickelli*) and two species of sharks – silky sharks (*Carcharhinus falciformis*) and scalloped hammerheads (*Sphyrna lewini*) (Phillips et al. 2016). A video of the 2015 expedition is available here: (<https://www.youtube.com/watch?v=0e3t18rrjOA>). Similar species and ecological communities could occur around Epi A, Epi B and Epi C.

Type and number of sources (score = 2)

A peer-reviewed paper, a trip report and two websites contributed information about this SUMA, but they were all pertaining to the geological aspects of the site. One source – a powerpoint presentation from mining policy consultations – provided some biological information about the Epi Caldera. To justify why the area might be special and unique, we used more generic information about seamounts (see sources for Site NO1: Northwest part of Santo), hydrothermal vents (5 websites, 2 reports, >10 papers), undersea volcanoes (1 report, 5 papers), and deep-water shrimp (1 peer-reviewed paper).

Obligations (score = 3)

There are obligations to protect and sustainably manage many fish species, including some associated with seamounts, within the Environmental Protection and Conservation Act 2002, Fisheries Management Act 2014 and subordinate regulations, including terms and conditions associated with licenses. Marine mammals, some sharks and some large predatory fishes such as tunas found around seamounts are on the IUCN Red List of Threatened Species and listed under the Vanuatu International Trade (Flora and Fauna) Act 1962, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

3.1.1.3 SITE NO3: VAGTANDE ISLAND

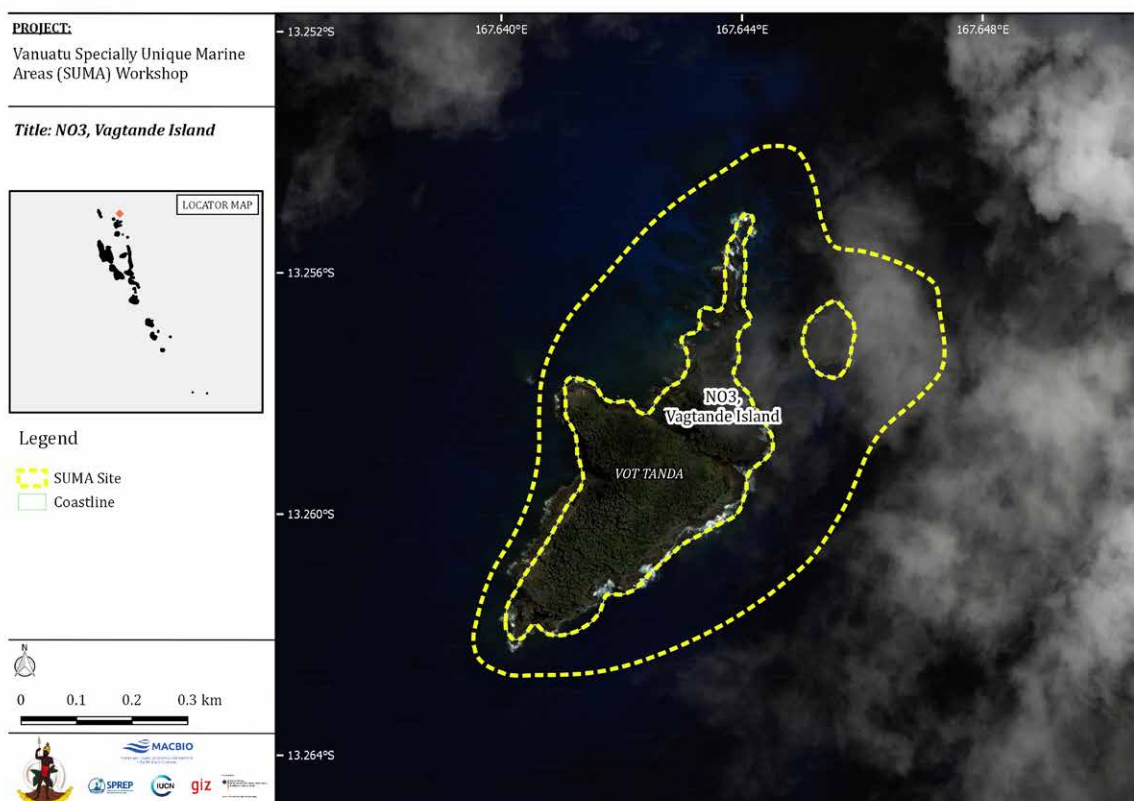


FIGURE 4. SITE NO3: Vagtande Island

TABLE 3. SITE NO3: Vagtande Island. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Score
Offshore SUMA – Northern region	Vagtande Island	NO3	9.5

Geographic boundaries

13.2613°S 167.638°E, 13.2563°S 167.6483°E

Geographic description (score = 3)

Vagtande Island, also commonly known as Vot Tande or Vatganai, is an uninhabited island approximately 50 km north of Mota Lava Island, at the edge of Vanuatu’s EEZ. The island is rocky, vegetated and steep-sided, approximately 850 by 350 m in dimension, with surrounding slopes that drop rapidly into deep water. The SUMA includes the island’s coast up to the high-water mark, and deep waters surrounding it.

Justification (score = 2)

This SUMA includes Vagtande Island’s surrounding waters that combine high marine biodiversity – isolated fringing coral reefs – and an important nesting site for seabirds.

There are shallow coral reefs among the 80 high islands in the Vanuatu archipelago, including fringing, atoll and barrier reefs that make up an area of approximately 4,110 km² (Naviti and Aston 2000; Government of Vanuatu 2016). Together with neighbouring countries, Vanuatu is considered one of the most “mega-diverse” countries, globally, for coral reef species (Allen 2008). The reefs support at least 469 reef fishes (AIMS 2007), 296 species of hard corals belonging to 62 genera (Veron 1990), 18 species of sea cucumbers (Johnson et al. 2017), 4 species of marine turtles and 4 species of marine mammals (Chin et al. 2011). Exposed coral reef slopes and crests tend to be dominated by coralline algae and low-lying plating and branching corals with tight morphologies (*Acropora* and *Pocilloporidae*); sheltered reefs are characterised by various species of *Acropora* and *Montipora* of different morphologies. Massive *Porites* tend to be found in open embayments, and more sheltered embayments can be dominated by soft corals (Naviti and Aston 2000). Research on sponges found that Vanuatu’s coral reef sponge assemblages were closely related to those on Australian Coral Sea reefs, suggesting that for some organisms on reefs further west, Vanuatu’s reefs could act as sources of larvae (Hooper et al. 2002).

Coral reefs are valued globally because of their high biodiversity, conservation and economic value. Human activities are degrading reefs worldwide; in the more populated parts of Vanuatu, terrestrial runoff and overfishing have taken their toll on many nearshore reefs (Raubani 2009; Chin et al. 2011; Edney et al. 2013). Crown-of-thorns starfish (COTs) outbreaks have put further pressure on coral communities (Done and Navin 1990; Houk and Raubani 2010). Signs of overfishing are evident even on smaller islands; Mota Lava, for example, was noted for its lack of larger parrotfish, grouper, trevally, bream, snapper, reef sharks and turtles (Edney et al. 2013). The reefs are also subject to frequent natural disturbance events, due to a combination of seismic activity and regular cyclones (Johnson et al. 2017). Nation-wide coral cover in 2008 was estimated at 26%, which was the lowest among neighbouring island nations of Fiji, New Caledonia, Samoa, Tuvalu and the Solomon Islands where sampling was conducted in a comparable manner (Wilkinson 2008). Chin et al. (2011) reported that of those reefs that have been studied, only 8% of Vanuatu’s coral reefs were considered “at low threat”; 37% of reefs were at medium threat, 41% at high threat and 14% at very high threat. Reefs in good condition within Vanuatu’s EEZ therefore become more valuable; this potentially includes remote and uninhabited reefs such as Vagtande Island, where flushing with clear oceanic water can promote faster recovery from disturbance (UniQuest Pty Ltd 2010). These more isolated, unimpacted coral reefs may be more resilient (able to return to their previous state after suffering damage) or resistant (able to withstand potential damage from, for example, climate change impacts) than those already under various degrees of other human pressure (McLean et al. 2016).

Resilient coral reefs are becoming more important and valuable, as their ability to recover from natural and climate change induced disturbance events confers to them a role of refuges and sources of larvae that assist the recovery of more damaged reefs (Holbrook et al. 2016a). Typically, coral reef resilience is expected to be higher on reefs further from human activities (McLean et al. 2016), with intact trophic structure, especially populations of predators and herbivores (Brewer et al. 2012; Holbrook et al. 2016a; McLean et al. 2016), higher coral cover (Hughes 2006), higher diversity (Ferrigno et al. 2016), greater structural complexity, deeper habitats acting as refuges, higher densities of juvenile corals and low nutrient loads (Graham et al. 2015). In the nearby Solomon Islands and Papua New Guinea, for example, high

coral cover and greater distances from markets is directly correlated with higher biomass of many families of reef fishes (Brewer et al. 2009; Cinner et al. 2009). Remote and isolated coral reefs also have a greater likelihood of hosting unique assemblages, genetically distinct populations, or even endemic species (Hughes et al. 2002; Hobbs et al. 2013).

Vagtande Island is also considered a significant seabird breeding island, unique for its large population of frigatebirds from which the island takes its name. No other specific information was available about which seabird species are found on the island. Overall, Vanuatu hosts 22 species of seabirds (Table 4), of which four are listed as Near Threatened, Vulnerable or Endangered on the IUCN Red List of Threatened Species (Wantok Environment Centre 2007; BirdLife International 2018a). An expedition in 2009 recorded a new species of collared petrel, *Pterodroma brevipes*, between Uréparapara and Vagtande Islands, but none on the island itself (Bretagnolle and Shirihai 2010).

The nesting activities of seabirds introduce nutrients into otherwise nutrient-poor and oligotrophic systems both on land and over adjacent waters, and are an integral component of island ecosystems (Wilson et al. 2006). Seabirds are top predators in many parts of the ocean where they forage, and their feeding and breeding activities create a unique connectivity between terrestrial and marine habitats (Birdlife International 2009). Most seabirds are adapted for extensive migrations, feeding on or just below the ocean's surface, and nesting in colonies on beaches and in other coastal habitats. Seabirds that nest on Pacific Islands often lay their eggs in rudimentary nests on shrub-like vegetation, in crevices or holes dug in the sand, or directly on the ground. During the nesting season, they forage in the waters surrounding their nesting sites, and this would include waters around Vagtande Island (Thaxter et al. 2012).

TABLE 4. Species of seabirds recorded in Vanuatu. (Birdlife International (2018a))

Scientific name	Common name	Family	IUCN Red List Category
<i>Phaethon lepturus</i>	White-tailed Tropicbird	Phaethontidae (Tropicbirds)	LC
<i>Fregatta tropica</i>	Black-bellied Storm-petrel	Oceanitidae (Southern Storm-petrels)	LC
<i>Nesofregatta fuliginosa</i>	Polynesian Storm-petrel	Oceanitidae (Southern Storm-petrels)	EN
<i>Pachyptila desolata</i>	Antarctic Prion	Procellariidae (Petrels, Shearwaters)	LC
<i>Pterodroma brevipes</i>	Collared Petrel	Procellariidae (Petrels, Shearwaters)	VU
<i>Pterodroma cervicalis</i>	White-necked Petrel	Procellariidae (Petrels, Shearwaters)	VU
<i>Ardenna pacifica</i>	Wedge-tailed Shearwater	Procellariidae (Petrels, Shearwaters)	LC
<i>Puffinus bailloni</i>	Tropical Shearwater	Procellariidae (Petrels, Shearwaters)	LC
<i>Pseudobulweria rostrata</i>	Tahiti Petrel	Procellariidae (Petrels, Shearwaters)	NT
<i>Fregata ariel</i>	Lesser Frigatebird	Fregatidae (Frigatebirds)	LC
<i>Fregata minor</i>	Great Frigatebird	Fregatidae (Frigatebirds)	LC
<i>Sula leucogaster</i>	Brown Booby	Sulidae (Gannets, Boobies)	LC
<i>Microcarbo melanoleucos</i>	Little Pied Cormorant	Phalacrocoracidae (Cormorants)	LC
<i>Anous stolidus</i>	Brown Noddy	Laridae (Gulls, Terns, Skimmers)	LC
<i>Gygis alba</i>	Common White Tern	Laridae (Gulls, Terns, Skimmers)	LC
<i>Onychoprion fuscatus</i>	Sooty Tern	Laridae (Gulls, Terns, Skimmers)	LC
<i>Sterna sumatrana</i>	Black-naped Tern	Laridae (Gulls, Terns, Skimmers)	LC
<i>Sterna hirundo</i>	Common Tern	Laridae (Gulls, Terns, Skimmers)	LC
<i>Thalasseus bergii</i>	Greater Crested Tern	Laridae (Gulls, Terns, Skimmers)	LC
<i>Stercorarius longicaudus</i>	Long-tailed Jaeger	Stercorariidae (Skuas)	LC
<i>Stercorarius parasiticus</i>	Arctic Jaeger	Stercorariidae (Skuas)	LC
<i>Stercorarius pomarinus</i>	Pomarine Jaeger	Stercorariidae (Skuas)	LC

Vagtande Island is located within the North Vanuatu-Santa Cruz Islandscape, because of its joint importance with the rest of the area for sustaining seabird populations, and to enhance resilience of marine ecosystems to climate change by preserving a latitudinal continuum of corals (USP 2012).

Type and number of sources (score = 2.5)

This SUMA was only mentioned in passing on two or three websites, with all the information coming from Wikipedia. Some information about coral reefs and seabirds in Vanuatu more generally was gathered from 11 reports, five peer-reviewed papers and two websites. Further information about the value of this SUMA was inferred from general knowledge about coral reefs (10 peer-reviewed articles) and seabirds (2 peer-reviewed articles and one website).

Obligations (score = 2)

Corals, fish and invertebrates found on coral reefs are subject to regulations under the Fisheries Management Act 2014, and many are listed under the IUCN Red List of Threatened Species, the Vanuatu International Trade (Flora and Fauna) Act 1962, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Many of Vanuatu’s seabirds are also listed under the acts above. The IUCN Red List of Threatened Species recognises the Tahiti petrel *Pseudobulweria rostrata* as Near Threatened, the collared petrel *Pterodroma brevipes* and white-necked petrel *Pterodroma cervicalis* as Vulnerable and the Polynesian storm-petrel *Nesofregetta fuliginosa* as Endangered. Vanuatu also has a National Plan of Action (NPOA) to reduce incidental catches of seabirds in longline fisheries. Birds are further protected under Vanuatu’s Wild Bird (Protection) Act Cap 30, but this applies mostly to land-based birds. Vagtande is included in the NBSAP (2018–2030) as an existing tabu site as a national priority for formal protection.

3.1.2 Offshore: Central Region

3.1.2.1 SITE CO1: WEST EFATE ISLAND SEAMOUNT

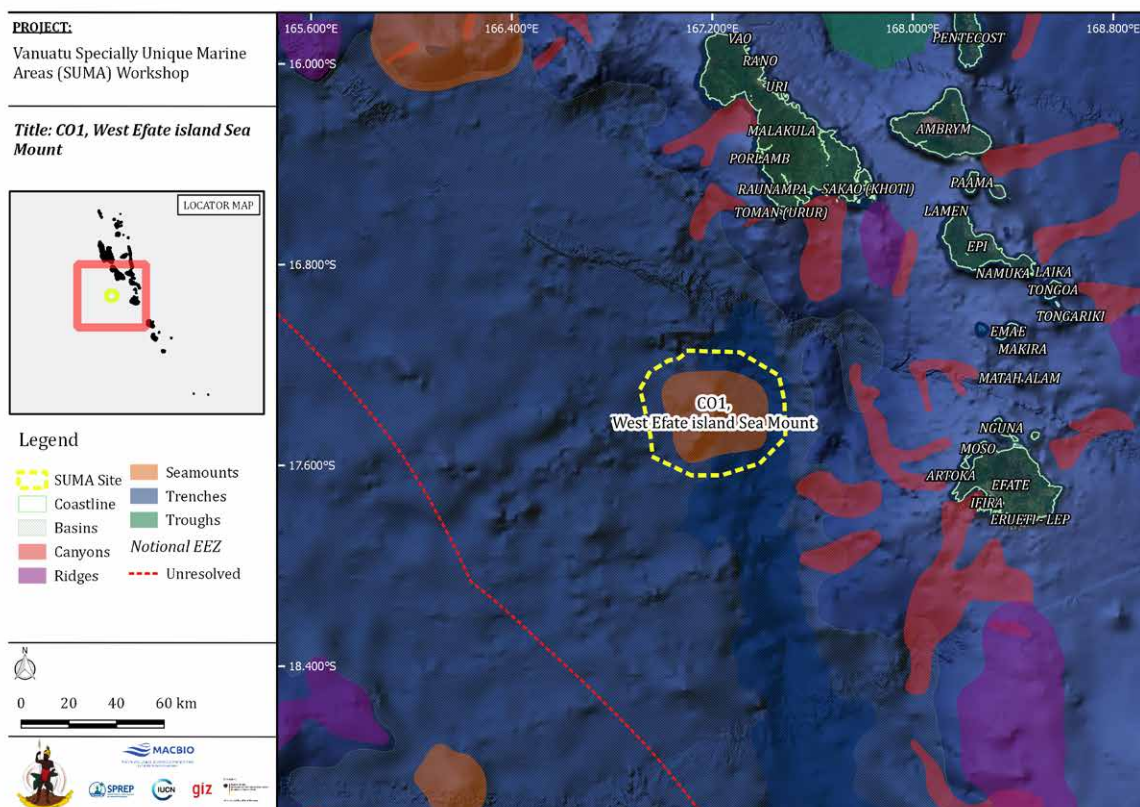


FIGURE 5. SITE CO1: West Efate Island seamount

TABLE 5. SITE CO1: West Efate Island seamount. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Offshore SUMA – Central region	West Efate Island Seamount	CO1	6.5

Geographic boundaries

17.1835°S 166.8912°E, 17.5836°S 167.5335°E

Geographic description (score = 2)

This SUMA, roughly circular in size with a 50 km diameter, comprises a seamount approximately 100 km west of Efate Island. This seamount is situated near the northern end of the Vanuatu Trench, and rises from its western margin.

Justification (score = 1)

The seamount within this SUMA has a peak at bathyal depths, and among the 11 seamount types identified by Harris et al. (2014), this one is classified as belonging to Group 3: “intermediate size, largest basal area and deepest peak depth”. This is one of the more common seamount types in Vanuatu’s waters. Workshop experts identified this SUMA as having nutrient-rich upwelling, supporting feeding aggregations of pelagic fishes. Increased productivity supporting aggregations of pelagic species is common around seamounts (Morato et al. 2010). For more general information about seamounts, see Site NO1: Northwest part of Santo; there was no further specific information about the seamount in this SUMA.

Type and number of sources (score = 1.5)

The seamount in this SUMA was identified by workshop participants and appears in a number of maps, and two peer-reviewed sources were consulted to infer its special, unique characteristics. The general sources used to describe seamounts for Site NO1: Northwest part of Santo are also relevant here.

Obligations (score = 2)

The Fisheries Management Act 2014 outlines obligations for the protection and sustainable use of fish stocks, including pelagic, demersal and deep-water species. The IUCN Red list includes the four species of tuna that potentially aggregate at the site, skipjack tuna are listed as Least Concern, yellowfin and albacore tuna are Near Threatened and bigeye tuna are Vulnerable. There are obligations to protect and sustainably manage many fish species, including some associated with seamounts and trenches, within the Environmental Protection and Conservation Act [CAP 283], Fisheries Management Act 2014 and subordinate regulations, including terms and conditions associated with licenses. Marine mammals, some sharks and some large predatory fishes such as tunas found around seamounts are on the IUCN Red List of Threatened Species and listed under the Vanuatu International Trade (Flora and Fauna) Act 1962, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

3.1.2.2 SITE CO2: CENTRAL VANUATU

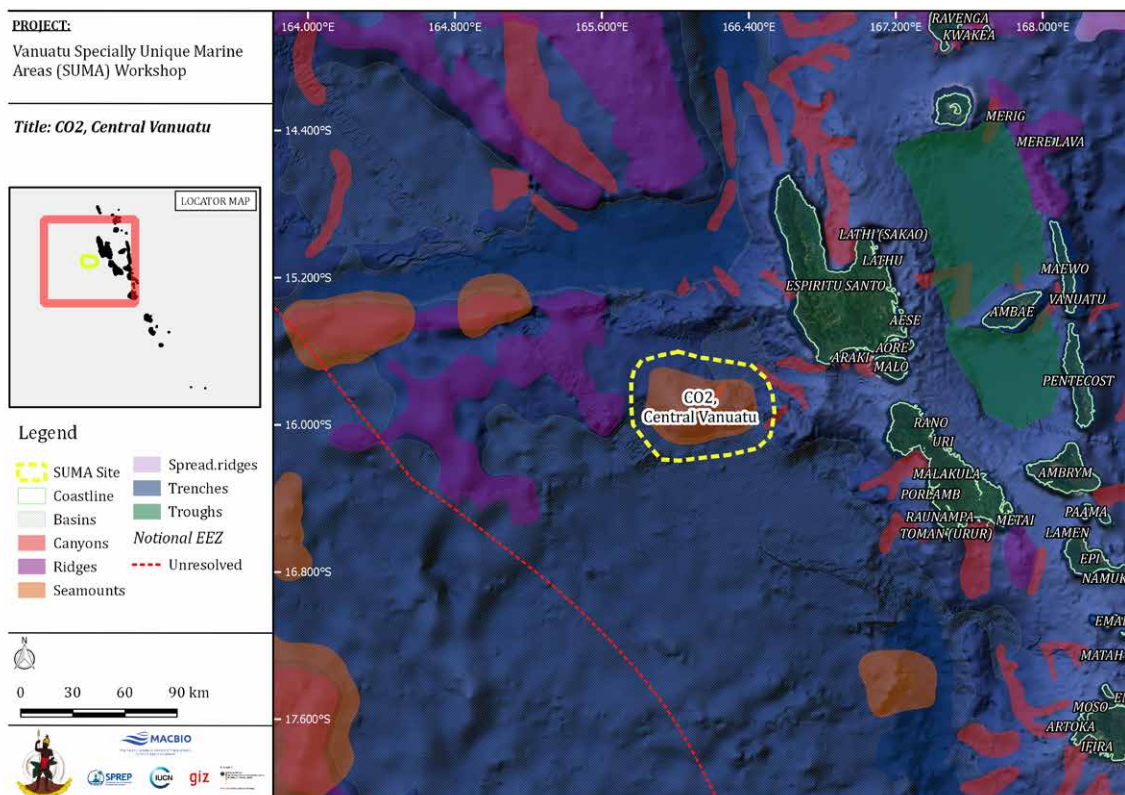


FIGURE 6. SITE CO2: Central Vanuatu

TABLE 6. SITE CO2: Central Vanuatu. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Offshore SUMA – Central region	Central Vanuatu	CO2	10.5

Geographic boundaries

15.636°S 165.7279°E, 16.132°S 166.5631°E

Geographic description (score = 3)

This SUMA encompasses the Sabine Bank, located approximately 78 km west of Santo Espiritu Island. The area within the SUMA is 75 by 50 km and includes the entire guyot down to its base. This guyot, or flat-topped seamount, rises almost to the surface.

Justification (score = 2)

The Sabine Bank is the only guyot of its type (Group 2: large and tall with shallow peak: shallow) (Harris et al. 2014) located entirely within Vanuatu's EEZ. The Sabine Banks and the nearby Bougainville Guyot have received a considerable amount of attention from a geophysical point of view, as they are within the collision / subduction zone between the d'Entrecasteaux Ridge and the Vanuatu island arc, one of the most tectonically active zones on earth. The Sabine Bank is situated on the Australian Plate, which is being subducted under the North Fiji Basin (Ballu et al. 2013), and its summit is capped with a living coral reef (Fisher et al. 1991; Gorman et al. 2012).

Modelling of benthic diversity shows that the area encompassing this SUMA hosts a benthic species richness of 600–950; this is among the highest values for the Vanuatu EEZ (AquaMaps 2014a). Pelagic species richness is also high in this area, with between 110 and 130 species modelled (AquaMaps 2014b). Seamounts usually have highly productive and diverse benthic assemblages, especially large seamounts and guyots, such as the Sabine Bank, that span across multiple bathymetric zones (see also Site NO1: Northwest part of Santo for general information about the ecological value of seamounts). Pelagic ecosystems around seamounts also tend to be highly productive, attracting feeding aggregations and acting as staging points for highly mobile or migratory species (Morato et al. 2010; Garrigue et al. 2015). The Sabine Bank has the additional feature of at least one coral reef, relatively isolated from direct human influence (see also Site NO3: Vagtande Island for information about Vanuatu's coral reefs). Modelling shows an area of high photosynthetically available radiation, chlorophyll-a concentration and productivity over this guyot (Oregon State University 2017; NASA 2018b, 2018a).

Type and number of sources (score = 2.5)

Geological information about this SUMA was available in the form of four peer-reviewed papers, and biophysical information about its values could be gleaned from eight published maps. A further three peer-reviewed papers were used for their general information about the characteristics of seamounts. General references pertaining to seamounts and coral reefs used in Site NO1: Northwest part of Santo and Site NO3: Vagtande Island are also relevant here.

Obligations (score = 3)

The Fisheries Management Act 2014 outlines obligations for the protection and sustainable use of fish stocks, including pelagic, demersal and deep-water species potentially associated with seamounts. The IUCN Red of Threatened Species list includes the four species of tuna that potentially aggregate at the site, skipjack tuna are listed as Least Concern, yellowfin and albacore tuna are Near Threatened and bigeye tuna are Vulnerable. There are obligations to protect and sustainably manage many species, including some associated with seamounts and coral reefs, within the Environmental Protection and Conservation Act [CAP 283], Fisheries Management Act 2014 and subordinate regulations, including terms and conditions associated with licenses. Marine mammals, some sharks and some large predatory fishes such as tunas found around seamounts are on the IUCN Red List and listed under the Vanuatu International Trade (Flora and Fauna) Act 1962, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The shallowest parts of the guyot are also subject to the International Maritime Organization (IMO) MARPOL 73 / 78 (International Convention for the Prevention of Pollution from Ships), Annex II: > 12 nm from land and > 25 m depth: noxious chemicals. Vanuatu is party to this Convention.

3.1.2.3 SITE CO3: EASTERN VANUATU CANYONS

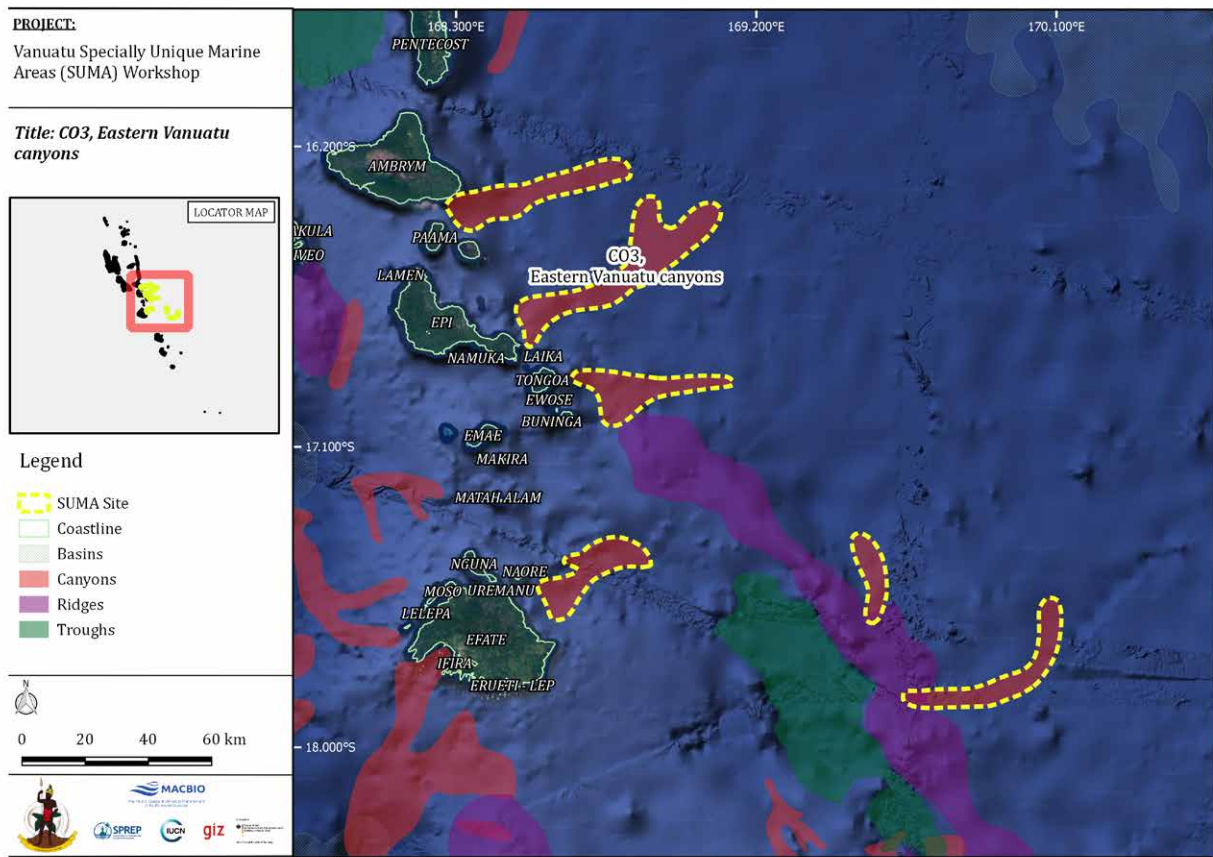


FIGURE 7. SITE CO3: Eastern Vanuatu canyons

TABLE 7. SITE CO3: Eastern Vanuatu canyons. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Offshore SUMA – Central region	Eastern Vanuatu canyons	CO3	6

Geographic boundaries

15.9696°S 168.7343°E, 18.4448°S 169.302°E

Geographic description (score = 1)

This SUMA encompasses an area to the east of the central Vanuatu island group where there is a series of at least six major canyons ranging in depth from about 1000m to 2300m. The orientation of the canyons varies, but they run primarily northeast to southwest. The SUMA includes the canyons themselves and the waters above them.

Justification (score = 1)

The complex topography created by canyons can support high benthic and pelagic biodiversity (De Leo et al. 2010; Vetter et al. 2010); the general area included within this SUMA was found, by a modelling study, to support a benthic species richness of between 650 and 950 species, which is among the highest values in Vanuatu's EEZ (AquaMaps 2014a), and moderate to high pelagic species richness (AquaMaps 2014b). One of the canyons is mentioned briefly as intersecting with the Epi submarine caldera (Greene and Exon 1988), which makes it possible that there may be some hydrothermal activity around this SUMA (Site NO2: East Epi).

The interaction between the canyons and the prevailing currents are thought to create turbulence and upwellings, where nutrient-rich deep water is pushed upwards (Genin 2004), often resulting in highly productive areas that attract aggregations of pelagic species (see also Site NO1: Northwest part of Santo). Studies in other canyons have shown

that the interaction between canyon topography and the water masses above it can create a “fertilization” effect (Muñoz et al. 2017). Some deep-sea organisms take advantage of the nutrient enrichment created by upwelling through vertical migration, and others feed on marine snow (Muñoz et al. 2017). Canyons are often pelagic ‘hotspots’, attracting aggregations of larger species of pelagic fishes (Bouchet et al. 2017) and marine mammals (Hooker et al. 1999; Guerra et al. 2017). Because of the relatively high abundance of fishes and invertebrates in canyons compared to surrounding areas, it is thought that they could also act as sources of larvae for habitats nearby (Vetter and Dayton 1999).

The central canyons of this SUMA lie within an area with intermediate catches of deepwater fish species (50–100 t), as measured between 2001 and 2010 (Sea Around Us Project 2016b). The catches include fish species that are typically long-lived and slow-growing (Table 8). Overall, there are about 107 species of deep-water fish in Vanuatu, best represented by the families Lutjanidae, Serranidae, Epinephelinae and Lethrinidae (UniQuest Pty Ltd 2010). Tuna catches are historically high throughout the SUMA, estimated at between 450 and 700 t from 2001 to 2010 (Sea Around Us Project 2009). These high catch rates indicate that both pelagic and benthic / demersal productivity are likely to be high above and within the canyons. This area of Vanuatu’s EEZ has intermediate phosphate, photosynthetically available radiation, chlorophyll-a concentration and productivity (CSIRO 2008; Oregon State University 2017; NASA 2018b, 2018a). However, it may be that the greatest “fertilization” effect of potential upwellings is taking place in subsurface waters (Muñoz et al. 2017).

TABLE 8. Deep-water fish species caught in Vanuatu’s deep-water fisheries.

According to Blanc (1988) and Vanuatu Fisheries Department (2016, in **bold**).

IUCN Red List of Threatened Species categories: LC: Least Concern; DD: Data Deficient; n: Not Evaluated.

Species	Common Name	IUCN
Aphareus rutilans	Rusty jobfish	LC
<i>Aprion virescens</i>	Green jobfish	LC
<i>Cephalopholis miniata</i>	Coral hind	LC
<i>Epinephelus areolatus</i>	Areolate grouper	LC
<i>Epinephelus chlorostigma</i>	Brownspotted grouper	LC
<i>Epinephelus maculatus</i>	Highfin grouper	LC
Epinephelus magniscuttis	Speckled grouper	DD
Epinephelus morrhua	Comet grouper	LC
Etelis carbunculus	Deep-water red snapper	LC
Etelis coruscans	Deep-water longtail red snapper	LC
Etelis radiosus	Pale snapper	LC
<i>Gymnocranius euanus</i>	Japanese large-eye bream	LC
<i>Gymnocranius lethrinoides</i>	Blue-lined large-eye bream	LC
Hyporthodus octofasciatus	Eightbar grouper	DD
<i>Hyporthodus septemfasciatus</i>	Convict grouper	LC
<i>Lethrinus miniatus</i>	Red throat emperor	LC
<i>Lethrinus variegatus</i>	Slender emperor	LC
Lipocheilus carnolabrus	Tang’s snapper	n
Lutjanus malabaricus	Malabar blood snapper	n
<i>Lutjanus rufolineatus</i>	Yellow-lined snapper	LC
<i>Ostichthys japonicus</i>	Japanese soldierfish	LC
Paracaesio kusakarii	Saddle-back snapper	LC
<i>Parupeneus heptacanthus</i>	Cinnabar goatfish	LC
<i>Priacanthus blochii</i>	Paeony bulleye	LC
Pristipomoides filamentosus	Crimson jobfish	LC
Pristipomoides flavipinnis	Golden eye jobfish	LC
Pristipomoides multidentis	Goldbanded jobfish	LC
Pristipomoides zonatus	Oblique-banded snapper	LC
<i>Seriola rivoliana</i>	Longfin yellowtail	LC
Wattsia mossambica	Mozambique large-eye bream	LC

Type and number of sources (score =2)

One peer-reviewed paper was found that mentioned one of the canyons in this SUMA in its description of the setting for the Epi Caldera. There were no other sources that referred directly to this SUMA, but information about the general area was inferred from eight maps, including two of fisheries catches, two of species richness and four of physical variables. Two general fisheries reports indicated the species caught by Vanuatu's deep-water fisheries in general, but did not give details of catch composition in this area. Seven peer-reviewed papers gave general information about the biophysical value of submarine canyons. The sources used to describe trenches in Site NO1: Northwest part of Santo and Site NO2: East Epi are also relevant here.

Obligations (score = 2)

The Fisheries Management Act 2014 outlines obligations for the protection and sustainable use of fish stocks, including pelagic, demersal and deep-water species. There are obligations to protect and sustainably manage many marine species, including some associated with canyons, within the Environmental Protection and Conservation Act [CAP 283], Fisheries Management Act 2014 and subordinate regulations, including terms and conditions associated with licenses. Marine mammals, some sharks and some large predatory fishes such as tunas that may aggregate over canyons are on the IUCN Red List of Threatened Species and listed under the Vanuatu International Trade (Flora and Fauna) Act 1962, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

3.1.3 Offshore: Southern Region

3.1.3.1 SITE SO1: FUTUNA TROUGH

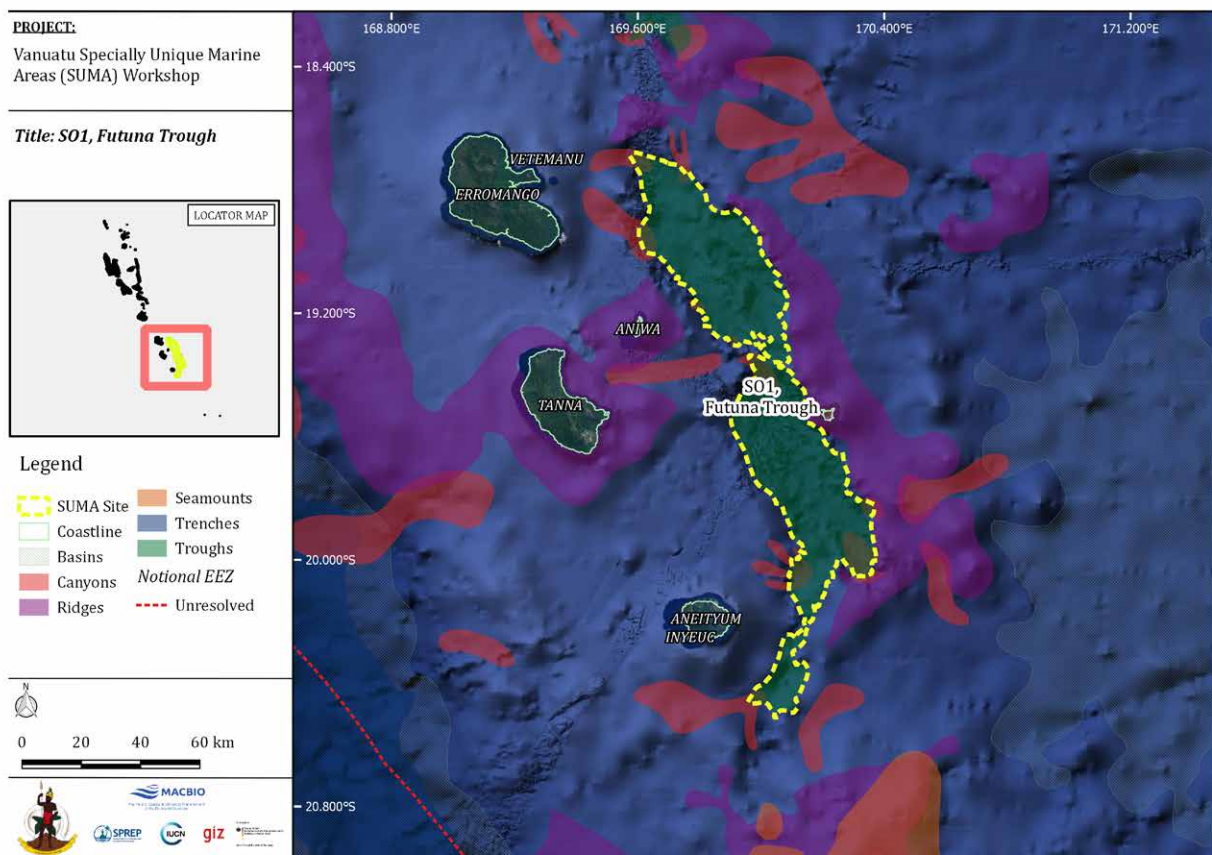


FIGURE 8. SITE SO1: Futuna Trough

TABLE 9. SITE SO1: Futuna Trough. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Offshore SUMA – Southern region	Futuna Trough	SO1	9.5

Geographic boundaries

18.566°S 170.0697°E, 20.5293°S 169.9749°E

Geographic description (score = 3)

The Futuna Trough lies to the east of the Tafea Island group. This SUMA includes two of the components of the Coriolis Troughs: the Erromango Trough and the Futuna Trough itself, spanning the entire depth of each trough. Both troughs are elliptical in shape and run parallel to the north-northwest orientation of the main island chain. Futuna Trough is an asymmetric “graben”²; 70 km long, 30 km across, and 3,600 m deep with a 2,000-m-high eastern flank scarp. The Erromango Trough is separated from the Futuna Trough by a sill at 2,000 m and has similar dimensions, although it is slightly shallower (3,100 m deep).

Justification (score = 2.5)

The complex topography created by canyons, troughs and trenches can support high benthic and pelagic biodiversity (De Leo et al. 2010; Vetter et al. 2010). The troughs included within this SUMA have very steep slopes and complex topography (Price et al. 1993), and were found by a modelling study to support a benthic species richness of between 650 and 950 species, which is among the highest values in Vanuatu’s EEZ (AquaMaps 2014a), and high pelagic species richness of between 120 and 130 species (AquaMaps 2014b). This area of Vanuatu’s EEZ has intermediate phosphate, oxygen, photosynthetically available radiation, chlorophyll-a concentration (0.08 mg m⁻³) and productivity (CSIRO 2008; VLIZ 2014; Oregon State University 2017; NASA 2018b, 2018a). An historic deep-water fishing site is located close to the boundary of this SUMA, suggesting high productivity of demersal species. Current catches of demersal species in the area are intermediate, between 50 and 100 t (Sea Around Us Project 2016b). Pelagic productivity appears high, with very high catch rates of tuna in this area (Sea Around Us Project 2009). For general information about the special, unique characteristics of submarine canyons, trenches and troughs see Site NO1: Northwest part of Santo and Site CO3: Eastern Vanuatu canyons .

This SUMA falls within the New Hebrides Trench Region EBSA (Department of Lands et al. 2011), which is thought to contain half of all the hydrothermal vent fields in the region (Secretariat of the Convention on Biological Diversity 2014). The known areas of hydrothermal vents are in the Vate Trough, the northernmost of the Coriolis Troughs, which is not included within this SUMA. However, given the geographic proximity and the similar geomorphic structure, it is possible that there are vent fields within the SUMA. Hydrothermal sulfides, barite-bearing iron oxyhydroxides, and vent fauna have been described for the Vate Trough and at a knoll west of the Futuna Trough, and hydrothermal Mn crusts were recorded on central ridges of Erromango Trough (McConachy et al. 2005). A Ti-rich island-arc tholeiite was dredged from a volcanic cone on the north-northwest flank of Futuna Trough (Neef and McCulloch 2001; McConachy et al. 2005). Dredging and camera tows in the Nifonea vent field showed clear evidence of active hydrothermal venting (Schmidt et al. 2017) and vent fauna, including galatheid crabs, mussels, tubeworms, spaghetti worms, and scale worms clustering around pillow margins and fractures (McConachy et al. 2005). It is likely that more of these structures and benthic communities remain to be discovered within this SUMA (Iizasa et al. 1998). For general information about hydrothermal vent communities, see Site NO2: East Epi.

Type and number of sources (score = 2)

Nine maps provided information about biophysical aspects of this SUMA, and four peer-reviewed papers had information about the SUMA, albeit mostly of a geological nature. One additional peer-reviewed paper and a report described adjacent and potentially similar habitats, allowing a degree of inference. General sources reviewed for Site NO1: Northwest part of Santo, Site NO2: East Epi and Site CO3: Eastern Vanuatu canyons are also relevant here.

² A depressed block of the Earth’s crust bordered by parallel faults.

Obligations (score = 2)

The Fisheries Management Act 2014 outlines obligations for the protection and sustainable use of fish stocks, including pelagic, demersal and deep-water species. There are obligations to protect and sustainably manage many marine species, including some associated with troughs, within the Environmental Protection and Conservation Act [CAP 283], Fisheries Management Act 2014 and subordinate regulations, including terms and conditions associated with licenses. Fishes, such as tunas, that may aggregate over troughs are on the IUCN Red List of Threatened Species and listed under the Vanuatu International Trade (Flora and Fauna) Act 1962, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The waters above these particular troughs are partially subject to the International Maritime Organization (IMO) MARPOL 73 / 78 (International Convention for the Prevention of Pollution from Ships) to which Vanuatu is party.

3.1.3.2 SITE SO2: EAST AND NORTHEAST ERROMANGO CANYONS

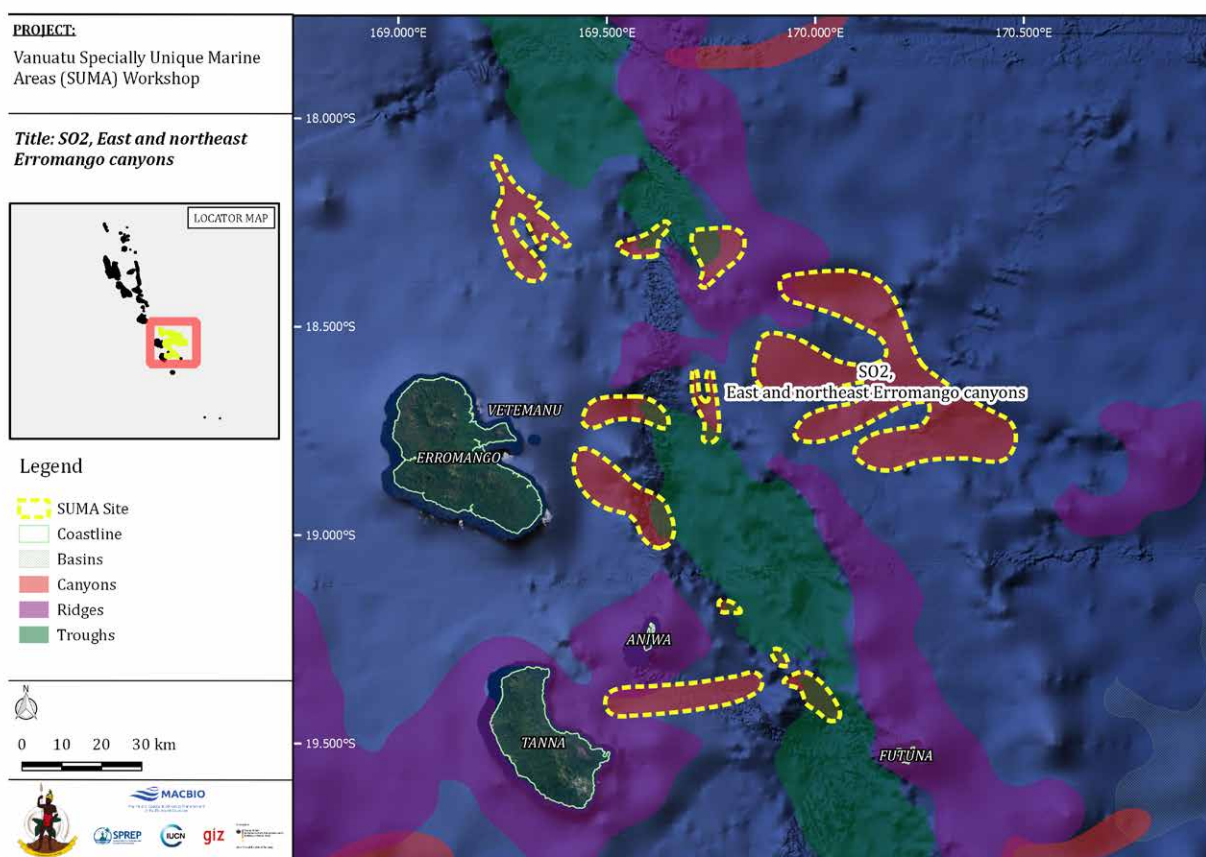


FIGURE 9. SITE SO2: East and northeast Erromango canyons

TABLE 10. SITE SO2: East and northeast Erromango canyons. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Offshore SUMA – Southern region	East and northeast Erromango canyons	SO2	5

Geographic boundaries

17.8527°S 170.272°E, 19.5643°S 169.5326°E

Geographic description (score = 1)

This SUMA encompasses an area to the east of Tafea Province (primarily Erromango and Tanna Islands), surrounding the Futuna Trough, where there is a series of at least 11 canyons of varying dimensions, shapes and orientations, ranging in depth from about 1300m to 2700m. The SUMA includes the canyons themselves and the waters above them.

Justification (score = 1)

Very little information exists about Vanuatu’s canyons; general knowledge about canyons reviewed for Site CO3: Eastern Vanuatu canyons is also relevant to this SUMA. Furthermore, a number of the canyons overlap with Site SO1: Futuna Trough; information reviewed for the Coriolis Troughs also applies here. The general area included within this SUMA was found, by a modelling study, to support a benthic species richness of between 600 and 950 species, which is among the highest values in Vanuatu’s EEZ (AquaMaps 2014a), and high pelagic species richness (AquaMaps 2014b).

The middle canyons of this SUMA lie within an area with intermediate catches of deepwater fish species (50–100 t), as measured between 2001 and 2010 (Sea Around Us Project 2016b). The catches include fish species that are typically long-lived and slow-growing (Table 8). This area of Vanuatu’s EEZ has intermediate phosphate, photosynthetically available radiation, chlorophyll-a concentration and productivity (CSIRO 2008; Oregon State University 2017; NASA 2018b, 2018a). However, it may be that the greatest “fertilization” effect of potential upwellings is taking place in subsurface waters (Muñoz et al. 2017).

Type and number of sources (score = 1)

Information about this SUMA was restricted to sources reviewed for Site CO3: Eastern Vanuatu canyons and Site SO1: Futuna Trough. No further information was available about these canyons.

Obligations (score = 2)

The Fisheries Management Act 2014 outlines obligations for the protection and sustainable use of fish stocks, including pelagic, demersal and deep-water species. There are obligations to protect and sustainably manage many marine species, including some associated with canyons, within the Environmental Protection and Conservation Act [CAP 283], Fisheries Management Act 2014 and subordinate regulations, including terms and conditions associated with licenses. Marine mammals, some sharks and some large predatory fishes such as tunas that may aggregate over canyons are on the IUCN Red List of Threatened Species and listed under the Vanuatu International Trade (Flora and Fauna) Act 1962, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

3.1.3.3 SITE SO3: HUNTER ISLAND TO NORTHEAST ERROMANGO SEAMOUNTS

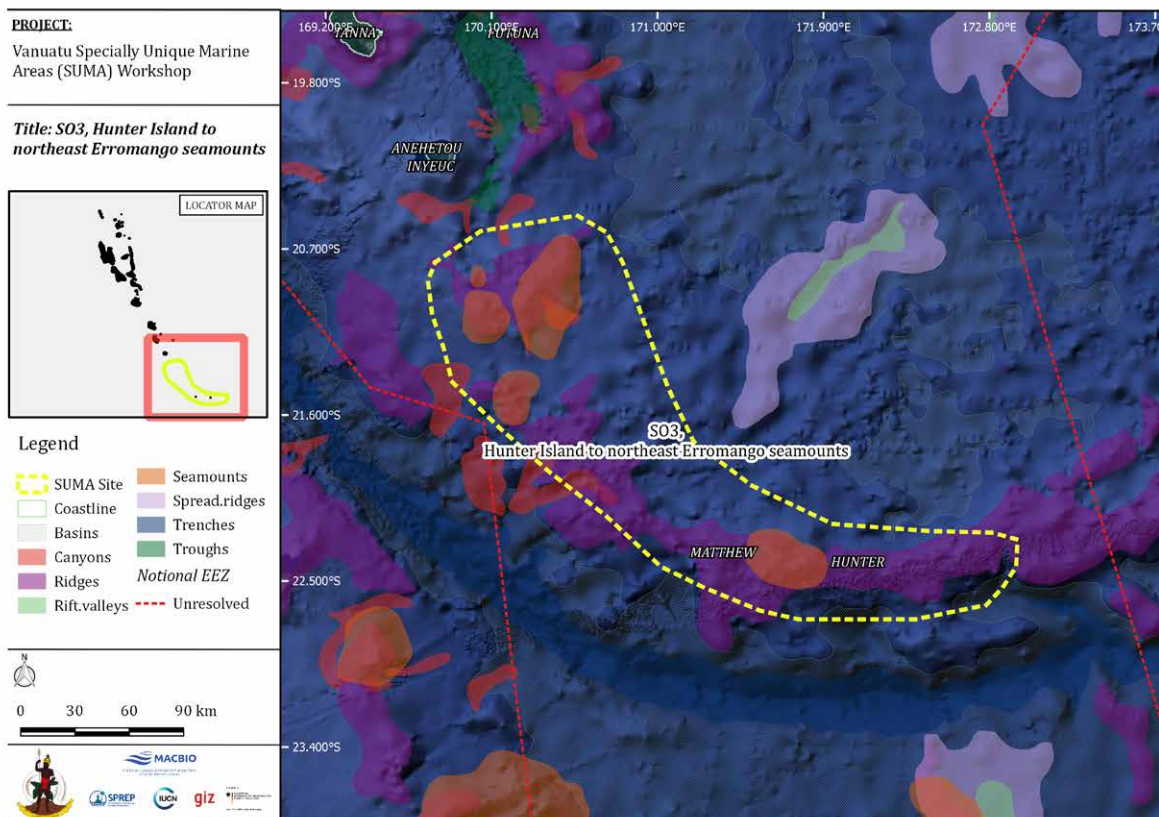


FIGURE 10. SITE SO3: Hunter Island to northeast Erromango seamounts

TABLE 11. SITE SO3: Hunter Island to northeast Erromango seamounts. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Offshore SUMA – Southern region	Hunter Island to northeast Erromango seamounts	SO3	9.5

Geographic boundaries

20.222°S 170.2051°E, 23.3516°S 172.2621°E

Geographic description (score = 1)

This SUMA includes the chain of seamounts on the eastern side of the Vanuatu Trench, from Hunter and Matthew Islands at the southern end to the seamounts southeast of Erromango Island. The SUMA is roughly 400 km long and between 50 and 100 km wide, and its shape follow the line of the seamount chain.

Justification (score = 2.5)

This chain of seamounts is essentially the southward continuation of the Vanuatu island chain on the eastern side of the Vanuatu Trench. There are two island-topped seamounts (Matthew and Hunter Islands), at least three other large seamounts that reach into the epipelagic or photic zone, and one with a peak in the bathypelagic zone (Blue Habitats 2018). Three different types of seamount occur: one is in Group 3 (intermediate size, with largest basal area and deepest deep peak); one is from Group 4 (small with deep peak; short with moderately deep peak); and three are from Group 3 (intermediate size, small, moderately tall and with the shallowest peak depths of this group) (Harris et al. 2014). Modelled benthic species richness in the SUMA falls within the two highest categories (~ 600–950 and 440–600 spp) for the region (AquaMaps 2014a), pelagic species richness is also expected to be comparatively high (115–120 spp) (AquaMaps 2014b), and measures of productivity (chlorophyll-a, frontal index, dissolved oxygen, ocean productivity) are medium to high (CSIRO 2009a; VLIZ 2014; Oregon State University 2017; NASA 2018b). Research on octocorals found that seamounts of the Norfolk and Loyalty Ridges, as well as Matthew and Hunter Islands, had high levels of rarity, patchiness and diversity, as well as high endemism, among individual seamounts (Pante et al. 2015). Most of the seamounts along the ridge are considered highly suitable for cold-water corals (Yesson et al. 2012) and deep-water fish species (Gomez et al. 2015).

Prominent features within this SUMA include Matthew and Hunter Islands, Charlotte Reef, Eva Seamount and the Gemini Seamounts. The East and West Gemini Seamounts have been studied only from a geological perspective, as they are volcanoes that were recently active (Monzier et al. 1993), and the Hunter Ridge has received some geological research (Sigurdsson et al. 1993; Durance et al. 2012). Matthew and Hunter Islands are Important Bird Areas (IBAs) (Table 12). Matthew Island hosts 13 species of seabird, nine of which are known to breed there. The IBA was specifically established to protect 851 breeding pairs of brown boobies (*Sula leucogaster*), 260 breeding pairs of blue noddy (*Procelsterna cerulea*) and 9,661 breeding pairs of waterbirds. Hunter Island has 13 species of seabirds, ten of which breed on the island (Borsa 2007). Hunter Island was declared an IBA especially to protect 100–200 breeding pairs of red-tailed tropicbird (*Phaethon rubicauda*) (BirdLife International 2018b). For more information about seabirds in general and in Vanuatu, see Site NO3: Vagtande Island. Matthew and Hunter Islands are fringed by coral reefs, relatively isolated from human activities. For further general information about Vanuatu’s coral reefs see Site NO3: Vagtande Island. No other biophysical information that highlights special or unique values for these features or the ridge that links them is available, although it was acknowledged, in the 1980s, that this was an area in need of exploration (SOPAC 1985).

TABLE 12. Species of seabird recorded on Hunter and Matthew Islands in 2004. (Borsa 2007)

Species	Common Name	Hunter Island	Matthew Island
<i>Pterodroma nigropennis</i>	Black-winged petrel	x	x
<i>Puffinus pacificus</i>	Wedge-tailed shearwater	x	x
<i>Phaethon rubricauda</i>	Red-tailed tropicbird	x	
<i>Sula dactylatra</i>	Masked booby	x	x
<i>Sula leucogaster</i>	Brown booby	x	x
<i>Sula sula</i>	Red-footed booby	x	
<i>Fregata ariel</i>	Lesser frigatebird	x	
<i>Fregata minor</i>	Greater frigatebird	x	
<i>Anous stolidus</i>	Brown noddy	x	x
<i>Gygis alba</i>	White tern	x	
<i>Sterna fuscata</i>	Sooty tern		x
<i>Procelsterna albivitta</i>	Grey noddy	x	x

Fisheries data shows relatively high longline catch rates, dominated by albacore tuna and followed by yellowfin tuna (Naviti 2005; Brouwer et al. 2017). Some of the black marlin tagged in Australia travelled to waters within this SUMA (Domeier and Speare 2012). High abundances of pelagic predators and migrations of highly mobile animals into an area indicate waters of especially high productivity, suggesting that this SUMA may possess qualities that attracts aggregations of marine life more generally (see also Site NO1: Northwest part of Santo).

Type and number of sources (score = 3)

Most of the sources that described aspects of this SUMA were about geology and volcanic activity (three peer-reviewed papers), but there was one peer-reviewed paper, one website and one report from which biophysical information could be extracted. Four peer-reviewed papers had some information or data about the SUMA, relating to its suitability for cold-water corals and deep-water snappers, the presence of certain categories of seamounts, and the location of tagged black marlin. Seven maps were used to collate further information about this SUMA, and general sources used for Site NO1: Northwest part of Santo and Site NO3: Vagtande Island are also relevant here.

Obligations (score =3)

The Fisheries Management Act 2014 outlines obligations for the protection and sustainable use of fish stocks, including pelagic, demersal and deep-water species. Deep-water fishing is restricted to vessels under 15 m in length out to 12 nm from Matthew and Hunter Islands. Vanuatu also has a National Plan of Action (NPOA) to reduce incidental catches of seabirds in longline fisheries. Birds are further protected under Vanuatu's Wild Bird (Protection) Act Cap 30, but this applies mostly to land-based birds. The IUCN Red list includes the four species of tuna that aggregate at the site, skipjack tuna are listed as Least Concern, yellowfin and albacore tuna are Near Threatened and bigeye tuna are Vulnerable. There are obligations to protect and sustainably manage many fish species, including some associated with seamounts, within the Environmental Protection and Conservation Act [CAP 283], Fisheries Management Act 2014 and subordinate regulations, including terms and conditions associated with licenses. Marine mammals, some sharks and some large predatory fishes such as tunas found around seamounts, as well as many coral reef species, are on the IUCN Red List of Threatened Species and listed under the Vanuatu International Trade (Flora and Fauna) Act 1962, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The waters around Matthew and Hunter Islands are subject to the International Maritime Organization (IMO) MARPOL 73 / 78 (International Convention for the Prevention of Pollution from Ships).

3.1.3.4 SITE SO4: VANUATU TRENCH

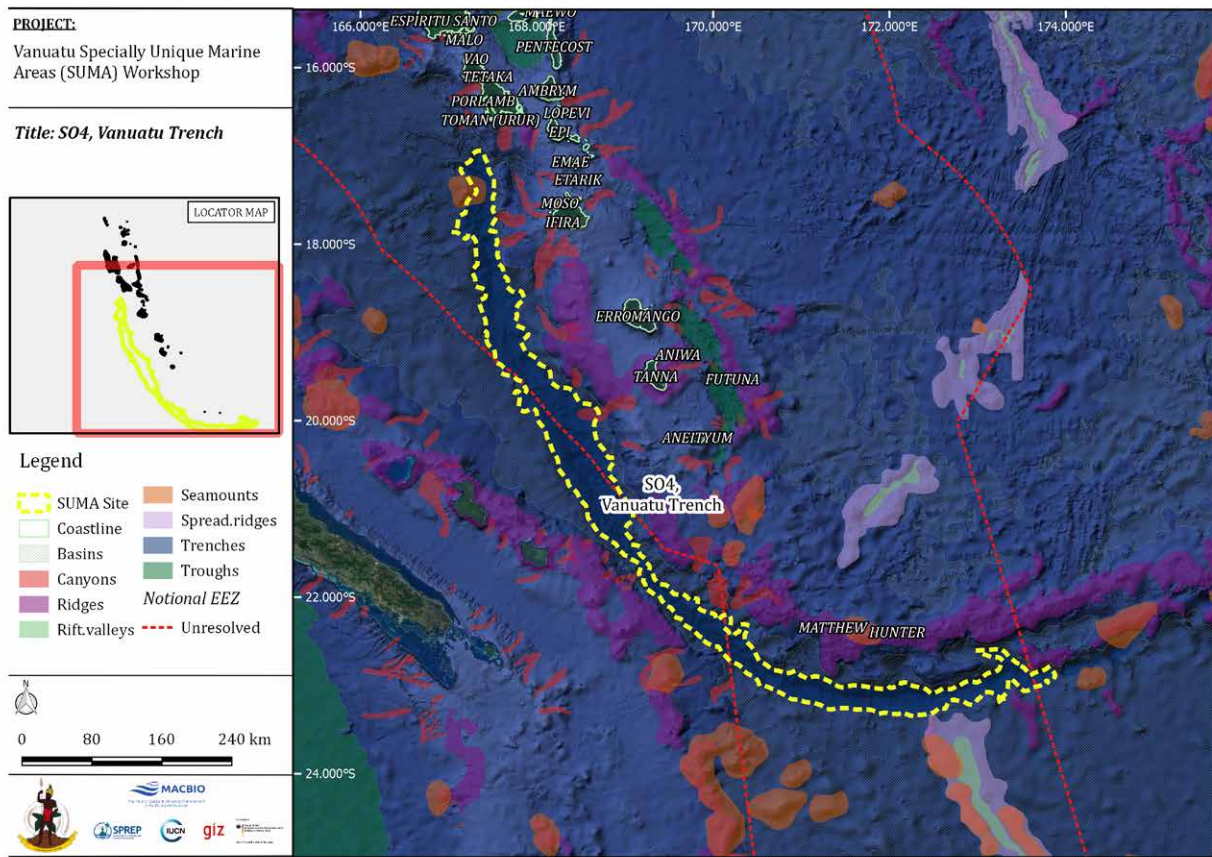


FIGURE 11. SITE SO4: Vanuatu Trench

TABLE 13. SITE SO4: Vanuatu Trench. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Offshore SUMA – Southern region	Vanuatu Trench	SO4	12

Geographic boundaries

16.9184°S 167.3326°E, 24.6722°S 172.2748°E

Geographic description (score = 3)

The Vanuatu Trench is about 1,200 km long and 70 km wide, covering an area of 84,000 km². The trench curls around the southern end of Vanuatu, diagonally symmetrical with the northern end of the nearby Tonga Trench. The SUMA covers the entire extent of the Trench within Vanuatu and the waters above it.

Justification (score = 3)

The Vanuatu Trench is one of the most prominent submarine trenches in the southwest Pacific, and one of the most tectonically active regions in the world. It reaches maximum depths of approximately 7,600 m. As with other submarine features in Vanuatu's EEZ, this SUMA has attracted considerable geological and geophysical research (e.g. Dubois et al. 1977). Modelled benthic and pelagic species richness falls within the two highest categories (about 600–950 and 440–600 spp for benthic, 115–120 and 120–130 spp for pelagic) for the region (AquaMaps 2014a, 2014b), and measures of productivity (chlorophyll-a, frontal index, dissolved oxygen, ocean productivity) are medium to high (CSIRO 2009a; VLIZ 2014; Oregon State University 2017; NASA 2018b). Part of the area also has relatively high indices for downwelling (CMEMS 2015), phosphate (CSIRO 2009b) and photosynthetically available radiation (NASA 2018a).

The central part of the Trench and the SUMA is included within the New Hebrides Trench Region EBSA (Secretariat of the Convention on Biological Diversity 2014). The special and unique values of the SUMA are echoed in the

characteristics for which the EBSA is listed: high abundance of deep-sea fishes, a high-energy eddy in the northern and southern parts of the Trench, high pelagic productivity indicated by high catches of tuna (skipjack, bigeye and albacore) and billfish (blue marlin, swordfish and sailfish) in the northern part of the trench (Sea Around Us Project 2009), and species adapted to very deep (abyssal and hadal) environments, unique to trench ecosystems (Secretariat of the Convention on Biological Diversity 2014; Lacey et al. 2016; Linley et al. 2016).

Aside from general knowledge about the special ecology of trenches and similar formations (Site NO1: Northwest part of Santo), in 2014 a research team from University of Aberdeen's Oceanlab and New Zealand's National Institute of Water and Atmospheric Research undertook an expedition to explore the depths of the Vanuatu Trench (Morelle 2014). They found a unique assemblage that was different from those of other Pacific trenches (Table 14). The commonly observed grenadiers were absent, replaced instead by cusk eels, which are rare elsewhere (Linley et al. 2016). Additionally, the area in and around the Vanuatu Trench was swarming with large red prawns, which are also rare in similar environments elsewhere. In fact, sampling for invertebrates in the Vanuatu Trench region yielded 3,065 individuals, including 19 species of which nine may be new to science and were not found in the other surveyed trenches (Lacey et al. 2016).

Deep waters in oligotrophic tropical oceans receive less nutrients from the waters above them than those at higher latitudes, suggesting that species frequenting the Vanuatu Trench have adapted to a low nutrient environment (Linley et al. 2017). Other research suggests that the separation of water masses created by the Tasman Front may have led to the separation of faunas between the Vanuatu Trench and other trench environments in the region, such as the Kermadec and Tonga Trenches (Clark et al. 2003; O'Hara et al. 2011; Zintzen et al. 2011). For more information on trenches in general, and further observations relevant to the Vanuatu Trench, see also Site NO1: Northwest part of Santo.

TABLE 14. Fish and amphipod species found in the Vanuatu Trench during the 2014 expedition.
(Lacey et al. 2016; Linley et al. 2017)

Taxa	Family	Species	Common name	Depth range (m)	
Fish	Chimaeridae	<i>Hydrolagus cf. affinis</i>	Small-eyed rabbitfish	2087–2578	
	Arhynchobatidae	cf. <i>Bathyraja richardsoni</i>	Richardson's skate	2087–2578	
	Synaphobranchidae	<i>Ilyophis robinsae</i> / Large Synaphobranchidae	Cutthroat eel	2087–5344	
		<i>Synaphobranchus brevidorsalis</i>	Shortdorsal cutthroat eel	2087–2087	
	Alepocephalidae	Alepocephalid spp.	Slickhead	2578–2578	
	Macrouridae	<i>Coryphaenoides longifilis</i>	Longfin grenadier	2087–2087	
		<i>Coryphaenoides rudis</i>	Rudis rattail	2087–2087	
	Moridae	<i>Antimora rostrata</i>	Blue antimora	2087–2578	
	Ophidiidae	cf. <i>Bassogigas</i> sp.	Cusk-eel	4700–5300	
		<i>Bassozetus</i> spp.	Cusk-eel	2087–6898	
		cf. <i>Bassozetus glutinosus</i>	Glutin assfish	2578–2578	
		<i>Spectrunculus grandis</i>	Giant cusk-eel	2578–2578	
	Zoarcidae	Zoarcid spp.	Eelpout	3424–6162	
	Amphipods	Alicellidae	<i>Alicella gigantea</i>		4700–7000
			cf. <i>Diatectonia</i>		3374
			<i>Diatectonia</i> sp.		3374
			<i>Paralicella caperesca</i>		1488–6968
<i>Paralicella tenuipes</i>				3400–7291	
<i>Tectoalopsis cf. wegneri</i>				3374–5180	
Cyclocaridae			<i>Cyclocaris</i> sp.		2000–5180
Eurytheneidae		<i>Eurythenes gryllus</i>		2000–7000	
Eusiridae		Eusiridae sp.		6228	
Hirondelleidae		<i>Hirondellea aff. brevicaudata</i>		3400–5600	
		<i>Hirondellea dubia</i>		4700–7000	
Lysianassidae		<i>Orchomenella gerulicorbis</i>		1488–7561	
Scopelocheiridae		<i>Paracallisoma</i> sp.		2000–5600	
		<i>Bathycallisoma schellenbergi</i>		5600–7000	
Uristidae		<i>Abyssorchomene abyssorum</i>		1488–5600	
		<i>Abyssorchomene musculosum</i>		1488–5173	
		<i>Abyssorchomene</i> sp.		2000–5300	
Valettioptidae	<i>Valettietta anacantha</i>		2197–7000		
	<i>Valettietta cf. gracilis</i>		4700–4835		

Type and number of sources (score = 3)

This SUMA is one of the rare offshore areas that has received some direct research highlighting its special, unique nature; one website and three peer-reviewed papers were used as sources to describe its values. Information was also gathered from seven maps and the EBSA report. Two peer-reviewed papers were cited as examples of geological research done in the Vanuatu Trench, and three peer-reviewed papers about nearby regions were used as a comparison. Sources used for Site NO1: Northwest part of Santo are also relevant here.

Obligations (score = 3)

The Fisheries Management Act 2014 outlines obligations for the protection and sustainable use of fish stocks, including pelagic, demersal and deep-water species. The IUCN Red list includes the four species of tuna that aggregate at the site, skipjack tuna are listed as Least Concern, yellowfin and albacore tuna are Near Threatened and bigeye tuna are Vulnerable; billfishes are also listed under various categories (blue marlin, *Makaira nigricans* are Vulnerable). There are obligations to protect and sustainably manage many fish species, including some associated with trenches, within the Environmental Protection and Conservation Act 2002, Fisheries Management Act 2014 and subordinate regulations, including terms and conditions associated with licenses. Marine mammals, some sharks and some large predatory fishes such as tunas found over trenches are on the IUCN Red List of Threatened Species and listed under the Vanuatu International Trade (Flora and Fauna) Act 1962, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

3.1.3.5 SITE SO5: SOUTHERNMOST VANUATU SEAMOUNTS

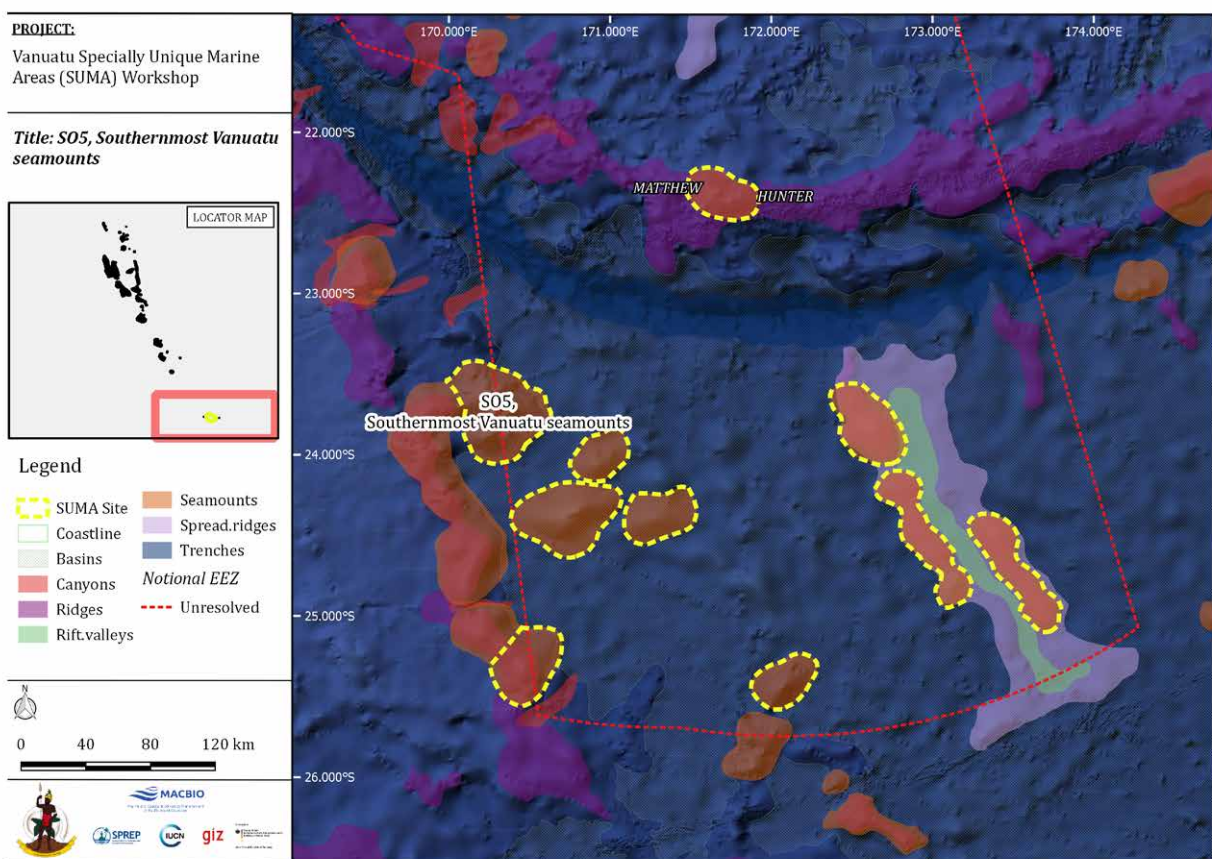


FIGURE 12. SITE SO5: Southernmost Vanuatu seamounts

TABLE 15. SITE SO5: Southernmost Vanuatu seamounts. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Offshore SUMA – Southern region	Southernmost Vanuatu seamounts	SO5	6

Geographic boundaries

22.0922°S 171.7088°E, 26.8821°S 171.3878°E

Geographic description (score = 1)

This SUMA includes nine seamounts to the south of the Vanuatu Trench, in the southernmost part of Vanuatu; they are located on the eastern side of the Loyalty Ridge in the South Fiji Basin.

Justification (score = 2)

The nine individual seamounts included in this SUMA lie in an area modelled to be of intermediate benthic and pelagic species richness (AquaMaps 2014b, 2014a), but this may be due to the lack of research conducted in this region to inform the modelling. Measures of productivity (chlorophyll-a, frontal index, nitrate, dissolved oxygen, ocean productivity) are relatively high (CSIRO 2009a, 2009c; VLIZ 2014; Oregon State University 2017; NASA 2018b), and at least two of the seamounts are expected to be moderately suitable for cold water corals (Yesson et al. 2012). The general area appears to have both downwelling and upwelling eddies (CMEMS 2015). At least five different seamount morphologies are found in the region: five belonging to Group 3 (intermediate size, with the largest basal area and deepest peak depth); two from Group 4 (small with deep peak, short with moderately deep peak); two from Group 5 (small and short with very deep peaks, shortest); one from Group 4 (small with deep peak, most common type); two from Group 4 (small with deep peak, short with moderately deep peak); and two Group 5 (small and short with very deep peaks, deepest type) (Harris et al. 2014). Three of the seamounts included in the SUMA appear to be composites of different types, with adjacent peaks and slopes that merge into each other.

The seamounts of the Hunter Ridge, north of the Vanuatu Trench, have been described in Site SO3: Hunter Island to northeast Erromango seamounts; the seamounts in this SUMA may have similar values. Additionally, seamount fauna in the adjacent regions, including the Loyalty Ridge, seamounts south of New Caledonia itself, and the Norfolk Ridge has been studied extensively, especially to resolve the question of how prevalent endemism is on seamounts. Research on octocorals on seamounts of the Norfolk and Loyalty Ridges, as well as Matthew and Hunter Islands, found high levels of rarity, patchiness and diversity, as well as high endemism, among individual seamounts (Pante et al. 2015). Other studies of the same region have found that other organisms (e.g. gastropods, alfonsoi) were genetically similar, possibly due to long larval duration and migration of adults between seamounts or even regions (Lévy-Hartmann et al. 2011; Castelin et al. 2012). Additionally, research on species richness and endemism of molluscs found no difference between seamounts and adjacent slope habitats (Samadi et al. 2006; Castelin et al. 2011). Given the proximity of this SUMA to seamounts and ridges that were investigated in those studies, these patterns may be relevant here. Rather than rising from a ridge, the seamounts in this SUMA are located within the South Fiji Basin (Davey 1982), which may lead to greater separation between faunas on individual seamounts, and hence greater diversity overall within the SUMA.

Humpback whales have also been intensely studied over the seamounts adjacent to this SUMA (e.g. Garrigue et al. 2015; Derville et al. 2018); the seamounts within it may also be important habitat for breeding humpback whales. For more information on the interactions between seamounts and pelagic species, see Site NO1: Northwest part of Santo.

Type and number of sources (score = 2)

To infer information about the particular seamounts in this SUMA, five peer-reviewed papers about seamounts of the adjacent Loyalty Ridge were cautiously used – caution was applied because these seamounts rise individually from a deep basin, rather than being connected by a ridge. Eight maps showed information about the general area of the SUMA, and one peer-reviewed paper illustrated the geological setting of the seamounts. Further information was taken from a general paper about cold-water coral habitat suitability, another about seamount types and two papers about whales tagged on seamounts in nearby regions. Sources used for Site NO1: Northwest part of Santo and Site SO3: Hunter Island to northeast Erromango seamounts are also relevant here.

Obligations (score = 1)

The Fisheries Management Act 2014 outlines obligations for the protection and sustainable use of fish stocks, including pelagic, demersal and deep-water species, and those associated with seamounts. There are obligations to protect and sustainably manage species associated with seamounts, within the Environmental Protection and Conservation Act [CAP 283], Fisheries Management Act 2014 and subordinate regulations, including terms and conditions associated with licenses. Marine mammals, some sharks and some large predatory fishes such as tunas found around seamounts are on the IUCN Red List of Threatened Species and listed under the Vanuatu International Trade (Flora and Fauna) Act 1962, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

3.2 INSHORE BIOPHYSICALLY SPECIAL, UNIQUE MARINE AREAS

This sub-section presents those SUMAs that were largely located in inshore environments. They are clustered into provincial groupings.

All the inshore SUMAs within the Vanuatu provisional EEZ are depicted in the figure below.

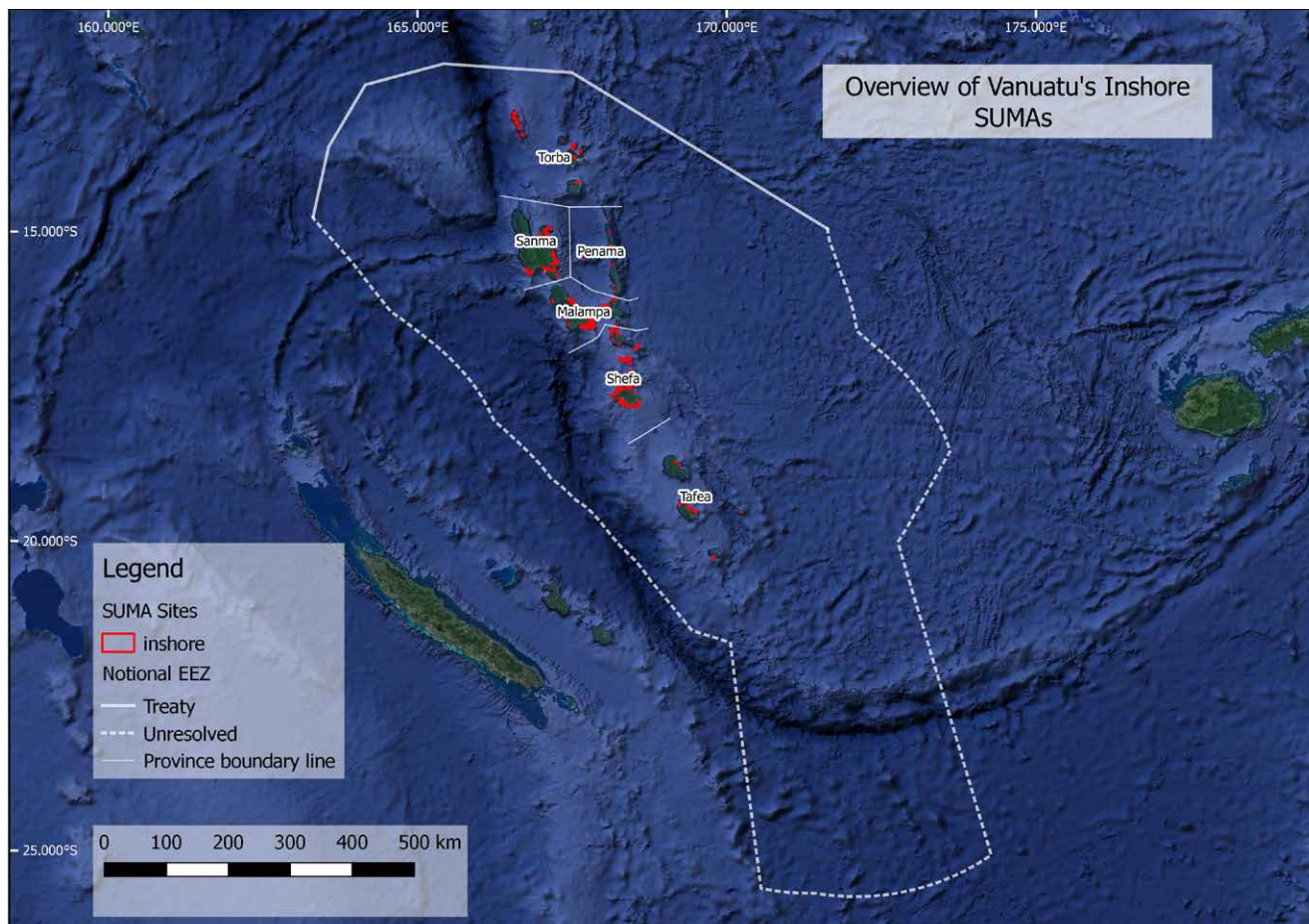


FIGURE 13. Overview of Vanuatu inshore SUMA sites.

3.2.1 Inshore: Torba Province: Torres Group

This inshore region consists of the Torres and Banks Islands (Torba).

3.2.1.1 SITE T1: METOMA ISLAND

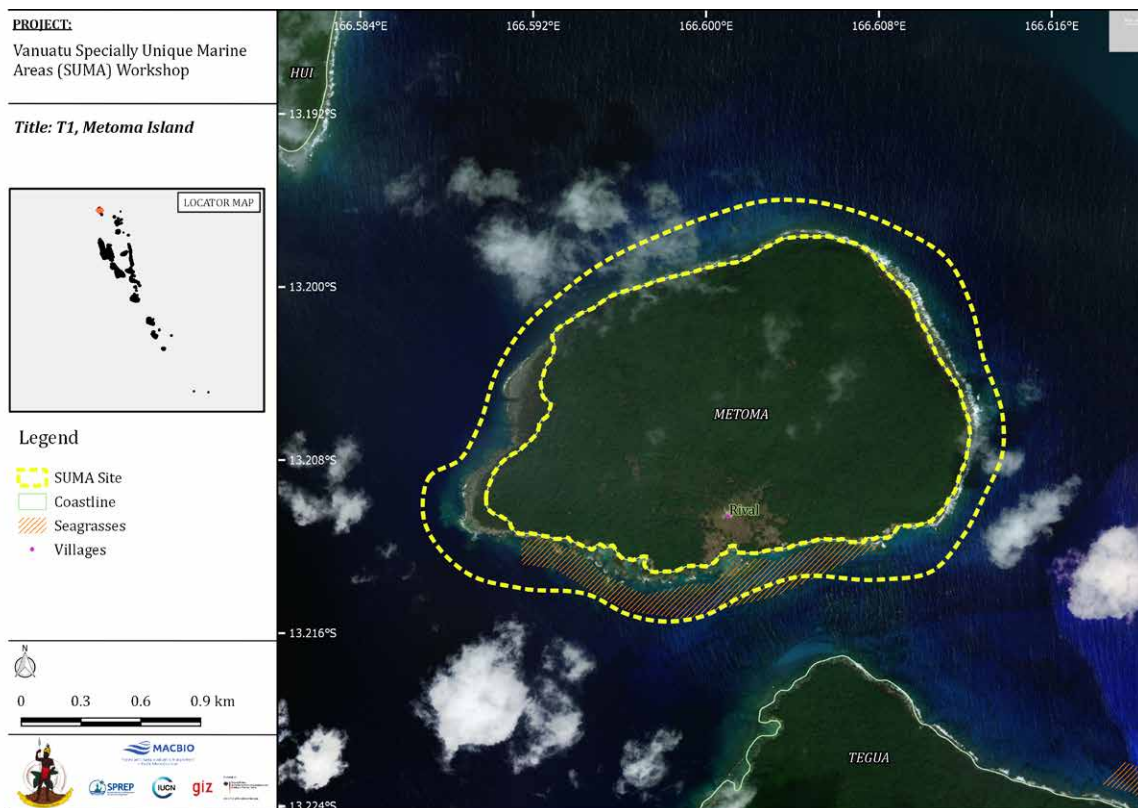


FIGURE 14. SITE T1: Metoma Island

TABLE 16. SITE T1: Metoma Island. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Torba Province	Metoma Island	T1	7

Geographic boundaries

22.0922°S 171.7088°E, 26.8821°S 171.3878°E

Geographic description (score = 3)

The Torres Islands are the northernmost island group in Vanuatu, straddling the cultural boundary that distinguishes Island Melanesia from several Polynesian outliers located in the neighbouring Solomon Islands. To the west is the deep Vanuatu Trench, the subduction zone between the Australian and Pacific Plates. Metoma is an island of 3 km² and is located between Tegua and Hiu Islands. The SUMA includes all marine habitats surrounding the island.

Justification (score = 1.5)

Workshop participants identified this SUMA as an important habitat for coconut crabs. The coconut or robber crab (*Birgus latro*) is the largest of the landcrabs, and the most highly terrestrialised decapod crustacean (Brown and Fielder 1991). This species is still dependent upon the sea, as it has a planktonic larval stage (Brown and Fielder 1991). It is widely distributed throughout the Indian and Pacific Oceans, and, although closely related to the hermit crabs, as adults they no longer require discarded mollusc shells. They are slow-growing and can reach an age of 40–60 years. They are highly sought after as food throughout the Indo-Pacific, and have been severely depleted in many areas (Vanuatu Fisheries Department 2013a). This makes locations where they remain abundant especially valuable, because their abundance can be an indication that other species and the habitat in general is likely to remain intact.

The Torba Province in general has been identified as naturally rich in coconut crabs, although stocks have been generally overharvested elsewhere (Amos 2007). Metoma Island is a site where coconut crab conservation is in process, with the collection of crabs forbidden (Vanuatu Fisheries Department 2013a), suggesting that stocks may still be healthy there (Brown and Fielder 1991; Government of Vanuatu 2016).

Type and number of sources (score = 1.5)

Three reports confirm that this SUMA is a coconut crab conservation area, and more information was added from a report on coconut crab stocks in the general Torres Islands region.

Obligations (score = 1)

Collection of coconut crabs is banned on Metoma Island, and there are broader obligations for their management under the Fisheries Management Act 2014 and the Coconut Crab Fisheries Management Plan 2013. The coconut crab is listed as Data Deficient on the IUCN Red List of Threatened Species.

Metoma is included in the NBSAP (2018–2030) as an existing tabu site as a national priority for formal protection.

3.2.1.2 SITE T2: TEGUA ISLAND



FIGURE 15. SITE T2: Tegua Island

TABLE 17. SITE T2: Tegua Island. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Torba Province	Tegua Island	T2	7

Geographic boundaries

13.2728°S 166.5793°E, 13.2203°S 166.637°E

Geographic description (score = 2)

Tegua Island is just south of Metoma Island (see above), and is the second-largest island in the Torres Islands chain at 6 km long and 7 km across. The SUMA includes inshore marine habitats along approximately 16 km on the western side of Tegua Island.

Justification (score = 2)

Workshop participants identified this SUMA as an important habitat for coconut crabs. The Torba Province in general has been identified as naturally rich in coconut crabs; Tegua Island is among the islands with the highest remaining abundances (Amos 2007). Some management occurred after early signs of overexploitation (Brown and Fielder 1991), and Tegua is now considered to have healthy populations (Vanuatu Fisheries Department 2013a). Tegua Island was also observed to have relatively high abundance of some sea cucumber species, especially lollyfish (*Holothuria atra*) and surf redfish (*Actinopyga mauritiana*) (Pakoa et al. 2013), which can be taken as an indication of relatively lower fishing pressure overall, and therefore intact coastal marine systems.

Type and number of sources (score = 2)

Four reports provided information about coconut crabs, and one report provided information about sea cucumbers on Tegua Island.

Obligations (score = 1)

Coconut crabs are subject to a quota of 1,500 crabs per year on Tegua Island, and there are broader obligations for their management under the Fisheries Management Act 2014 and the Coconut Crab Fisheries Management Plan 2013. The coconut crab is listed as Data Deficient on the IUCN Red List of Threatened Species.

3.2.1.3 SITE T3: HIU ISLAND

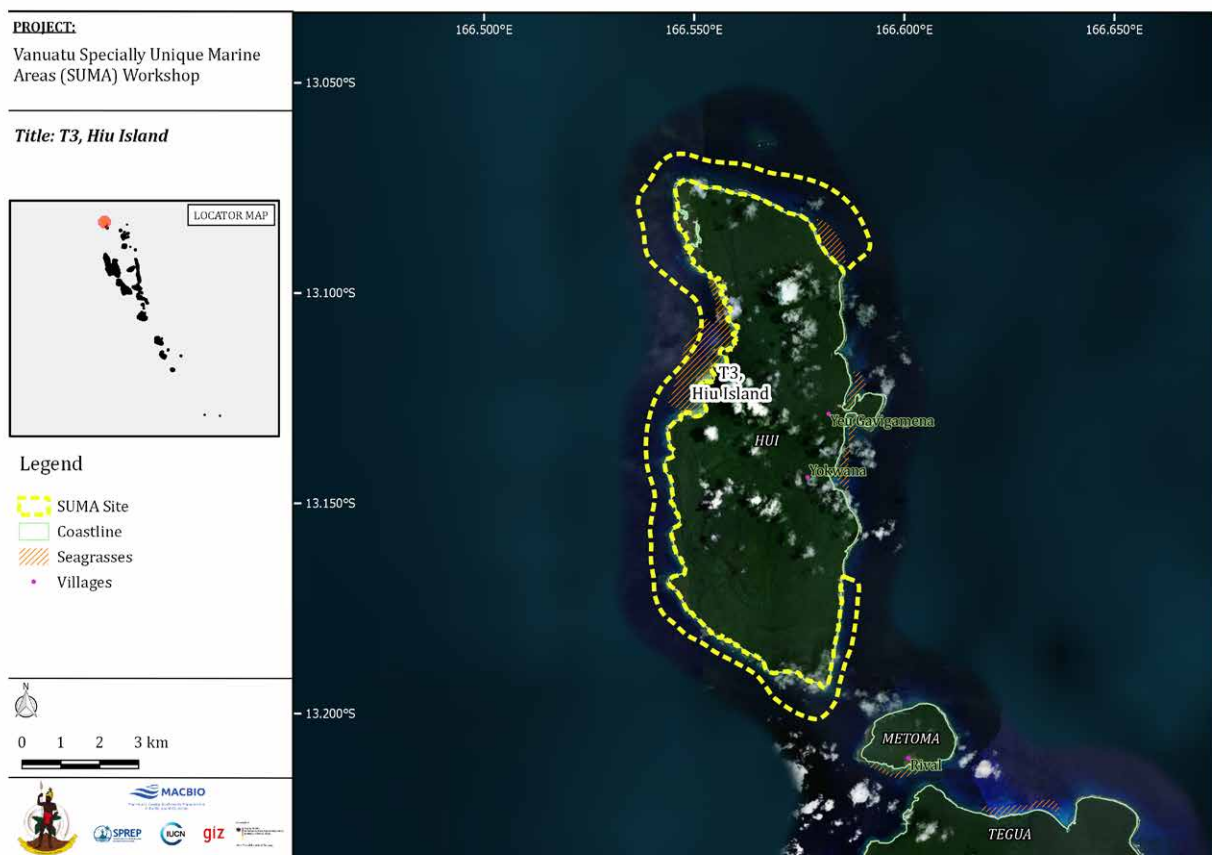


FIGURE 16. SITE T3: Hiu Island

TABLE 18. SITE T3: Hiu Island. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Torba Province	Hiu Island	T3	7

Geographic boundaries

13.1998°S 166.5327°E, 13.0684°S 166.5925°E

Geographic description (score = 2)

Hiu Island is the northernmost and largest island in the Torres Islands chain. The SUMA includes inshore marine habitats along most of the island's coastline, except for approximately 6 km of its eastern side.

Justification (score = 2)

Workshop participants identified this SUMA as an important habitat for coconut crabs. The Torba Province in general has been identified as naturally rich in coconut crabs; Hiu Island was among the islands of Vanuatu with the highest abundances in 2006 (Amos 2007). Genetic work shows that Hiu Island's coconut crab populations may have greater affinity with those of the Solomon Islands than with those of nearby Tegua Island (Brown and Fielder 1991), which may indicate greater genetic differentiation more generally of the organisms on Hiu Island compared to other islands of Vanuatu. Hiu Island is still considered to have healthy populations of coconut crab (Vanuatu Fisheries Department 2013a).

Hiu Island was also observed to have relatively high abundance of some sea cucumber species, especially lollyfish (*Holothuria atra*) (Pakoa et al. 2013), which can be taken as an indication of relatively lower fishing pressure overall, and therefore intact coastal marine systems.

Type and number of sources (score = 2)

Four reports provided information about coconut crabs, and one report provided information about sea cucumbers on Hiu Island.

Obligations (score = 1)

Coconut crabs are subject to a quota of 1,500 crabs per year on Hiu Island, and there are broader obligations for their management under the Fisheries Management Act 2014 and the Coconut Crab Fisheries Management Plan 2013. The coconut crab is listed as Data Deficient on the IUCN Red List of Threatened Species.

3.2.1.4 SITE T4: LINUA

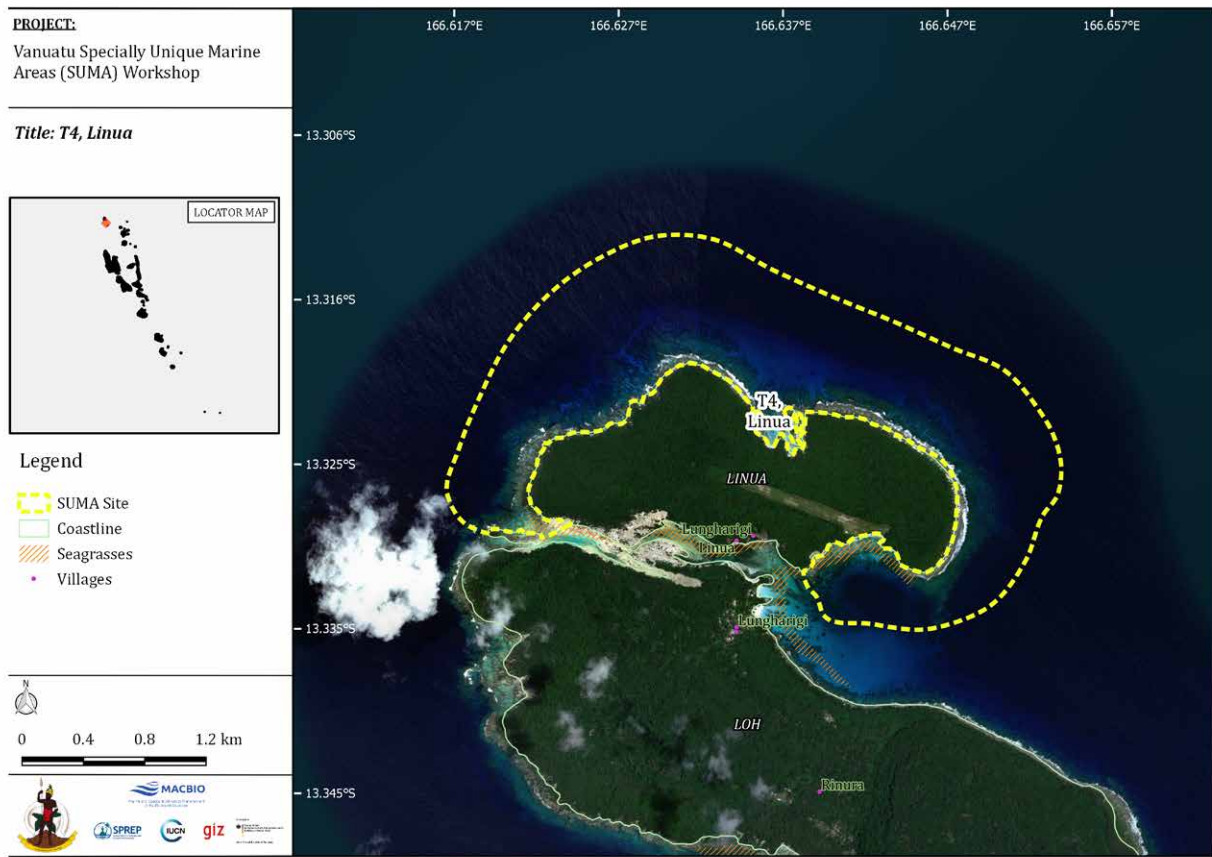


FIGURE 17. SITE T4: Linua

TABLE 19. SITE T4: Linua. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Torba Province	Linua	T4	10

Geographic boundaries

13.3089°S 166.621°E, 13.3376°S 166.6507°E

Geographic description (score = 3)

Linua Island is connected to the northern end of Loh Island, which is in the southern half of the Torres Islands chain, by an intertidal channel / sand spit. The SUMA encompasses inshore marine habitats surrounding Linua Island, which is about 2.7 km wide and 1.6 km long. The SUMA excludes the narrow intertidal connection between the two islands.

Justification (score = 2)

Workshop participants identified this SUMA as an important habitat for coconut crabs, and for its stand of mangroves, which are rare in the Torres Island group. It also contains a lagoon, a tidal flat and seagrass beds, adding to habitat complexity. The Torba Province in general has been identified as naturally rich in coconut crabs; Loh Island was among the islands with lower abundances in 2006 (Amos 2007). Loh Island is currently considered to have healthy populations, despite overfishing in the past (Vanuatu Fisheries Department 2013a). Linua Island is proposed as a coconut crab reserve (Government of Vanuatu 2016).

Mangrove forests are highly specialized and adapted to coastal and intertidal environments (Alongi 2008). They provide nursery grounds for fish and crustaceans, feeding and breeding grounds for birds, shoreline protection, sediment and nutrient trapping of runoff, carbon sequestration and habitat for a diverse assemblage of mangrove specialist species

(Barbier et al. 2011). They are a key component in the maintenance of water quality for nearshore marine environments, and are ecologically linked to seagrass beds and coral reefs (Olds et al. 2013). Mangrove forests constitute the most extensive wetland vegetation in Vanuatu, taking up between 2,500 and 3,000 ha. Approximately 24 species of mangrove tree ('natongtong') have been recorded, including a new species, *Sonneratia X gulngai*, discovered in Vanuatu in 2012 (Baereleo et al. 2013). Typically, there are four recognizable mangrove or coastal habitat zones found as one moves from inland to seaward: a landward fringe of uncertain species composition, as it has been cleared in most places; thickets of *Ceriops tagal* with the mangrove fern *Acrostichum aureum*; a *Rhizophora* spp. forest zone; and a seaward forest zone of *Avicennia marina*, occasionally with scattered *Sonneratia caeseolaris* and *Bruguiera* sp. (Kalfatak and Jaensch 2014). Almost 2,000 ha of mangroves occurs on Malekula; elsewhere, mangroves occur as small stands or narrow belts along lagoons, coastlines and estuaries. No specific information was found about mangroves on Linua Island, Loh Island or the Torres Island Group.

Seagrass beds provide food sources and key habitats for numerous marine organisms, including protected species (e.g. dugongs, green turtles) and species of commercial or subsistence value (e.g. emperors). Many species that are ecologically and commercially important, especially invertebrates, use seagrass beds as nurseries (McDevitt-Irwin et al. 2016). Seagrasses also contribute to the primary production of shallow marine habitats and stabilize sediments, hence contributing to coastal protection (Norlund et al. 2016). They are vulnerable to poor water quality, excessive sedimentation and destructive fishing (Ellison 2009). The seagrass communities of in Vanuatu are thought to consist of twelve species of seagrass (Ellison 2009), the most widespread being *Thalassia hemprichii*, *Cymodocea rotundata*, *Halodule inermis*, *Enhalus acoroides* and *Halophila ovalis*. Dense stands of seagrasses are located in shallow lagoons, bays and intertidal areas, where sand is the major or only substrate component (Kalfatak and Jaensch 2014). However, overall there have been two assessments of seagrasses in Vanuatu as part of wider biodiversity surveys published in 1990 and 2011, but complete habitat mapping of seagrasses in Vanuatu has not been conducted; therefore, the total area of seagrass beds in Vanuatu is unknown (GEF-UNEP-CMS 2016). No information exists about seagrass beds specifically in this SUMA.

Type and number of sources (score = 2)

Two reports were found about coconut crabs on Loh Island, but none specifically mentioned Linua Island. Six peer-reviewed papers and four reports provided information about mangroves and seagrass beds in general, and in Vanuatu. The NBSAP (2018–2030) proposed the Island as a reserve.

Obligations (score = 3)

Coconut crabs are subject to a quota of 500 crabs per year on Loh Island, and there are broader obligations for their management under the Fisheries Management Act 2014 and the Coconut Crab Fisheries Management Plan 2013. The coconut crab is listed as Data Deficient on the IUCN Red List of Threatened Species. There are obligations to protect and sustainably manage species associated with seagrass beds and mangroves within the Environmental Protection and Conservation Act 2002, the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. Some fishes and invertebrates associated with seagrass beds and mangroves are listed under CITES and on the IUCN Red List of Threatened Species. Linua is included in the NBSAP (2018–2030) as an existing coconut crab reserve site as a national priority for formal protection.

3.2.1.4 SITE T5: BLACK ROCK, TOGA ISLAND

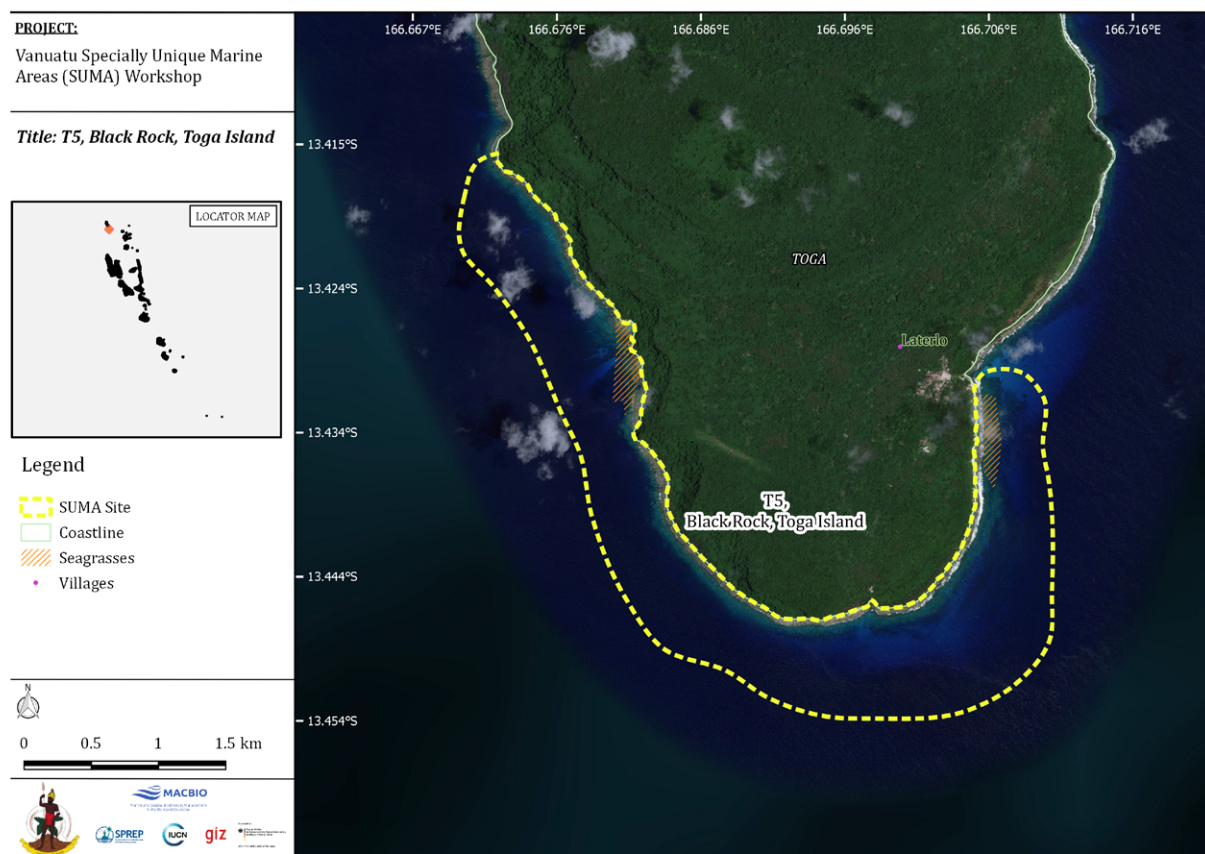


FIGURE 18. SITE T5: Black Rock, Toga Island

TABLE 20. SITE T5: Black Rock, Toga Island. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Torba Province	Black Rock, Toga Island	T5	4.5

Geographic boundaries

13.4147°S 166.6712°E, 13.4588°S 166.706°E

Geographic description (score = 2)

Toga Island is the southernmost island of the Torres Island chain. The SUMA stretches for 7 km around the coast and out to 700 m from shore, and includes inshore marine habitats around the southern half of the island.

Justification (score = 1)

Workshop participants identified this SUMA as an important habitat for coconut crabs. The Torba Province in general has been identified as rich in coconut crabs, but Toga Island is usually grouped with Metoma Island as having lower numbers of coconut crabs (Amos 2007; Vanuatu Fisheries Department 2013a). No other information was available about coconut crabs on Toga Island; for general information about coconut crabs in Vanuatu, see Site T1: Metoma Island.

Type and number of sources (score = 0.5)

One report mentioned information coconut crabs on Toga Island. Sources used to describe coconut crabs in Site T1: Metoma Island are also relevant here.

Obligations (score = 1)

There are obligations for the management of coconut crabs under the Fisheries Management Act 2014 and the Coconut Crab Fisheries Management Plan 2013. The coconut crab is listed as Data Deficient on the IUCN Red List of Threatened Species. Toga is included in the NBSAP (2018–2030) as an existing coconut crab reserve site as a national priority for formal protection.

3.2.2 Inshore: Torba Province: Banks Group

3.2.2.1 SITE T6: AVER

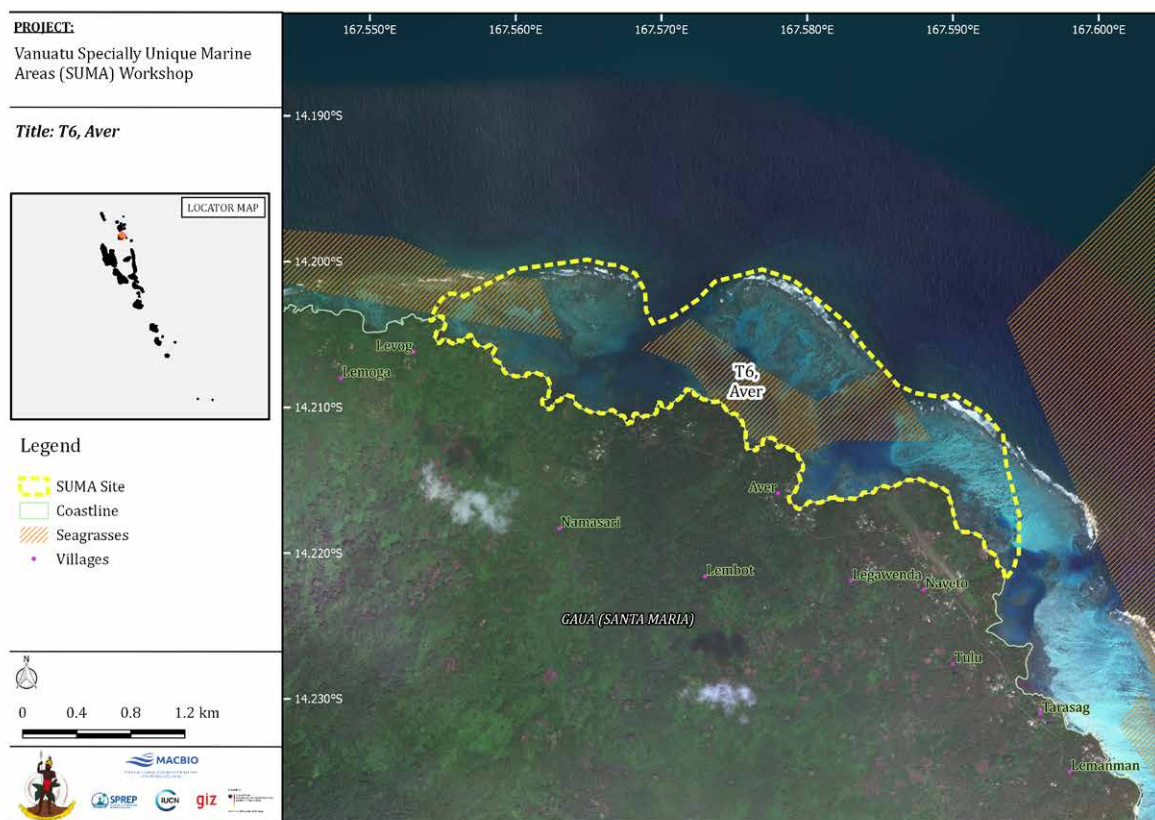


FIGURE 19. SITE T6: Aver

TABLE 21. SITE T6: Aver. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Torba Province	Aver	T6	6

Geographic boundaries

14.193°S 167.5585°E, 14.2226°S 167.5935°E

Geographic description (score = 2)

Gaua (342 km²) is the largest of the Banks Islands in Torba Province of northern Vanuatu. Aver Village is on the northern coast of Gaua, and just offshore is a chain of barrier reefs. The SUMA encompasses approximately 5 km of this coastline, and extends out to include the barrier reef.

Justification (score = 1)

Workshop participants indicated that this area has mangroves that provide rich feeding grounds for migratory eels (Schabetsberger et al. 2013). There was also an indication that the barrier reef system in this SUMA is relatively unique within Vanuatu. It is currently under protection as a fish nursery area, whereby the chief is the authority who decides which species can be fished at which times (Government of Vanuatu 2016). Broader information about mangroves and coral reefs in Vanuatu are reviewed in Site T4: Linua and Site NO3: Vagtande Island.

There is no further direct information about the mangroves and reefs off Aver Village, but OceansWatch reports describe marine communities from the western side of Gaua Island; this may reflect the habitats around the rest of the island. Shallow reef flats were characterised by abiotic components such as sand, silt and rubble, live coral cover was 10% and was dominated by branching corals of the genus *Acropora* (Le Poidevin et al. 2015); later surveys reported slightly different result of 30–50% coral cover dominated by massive and encrusting forms, using different methods (Hooper et al. 2016). It is not possible, with currently available knowledge, to distinguish characteristics of the fringing reef from the barrier reef.

The status of the reef flat habitats may be reflective of a frequently disturbed environment typical of reefs surrounding active volcanoes, as is the case here (Reuter and Piller 2011; Vroom and Zgliczynski 2011). Fish communities were dominated by small individuals, and there were signs that herbivores, carnivores, larger piscivores and commercially valuable invertebrates (e.g. green snails) had been depleted at this site (Le Poidevin et al. 2015). This would make areas known to host important life stages of coral reef organisms more valuable.

Type and number of sources (score = 1)

One report (Vanuatu’s NBSAP) mentioned this SUMA as a protected area, two reports described coral reef communities elsewhere on Gaua Island and one peer-reviewed paper reported on migratory freshwater eels. Two peer-reviewed papers provided knowledge about marine communities on the slopes of active volcanoes. Sources reviewed for Site T4: Linua and Site NO3: Vagtande Island are also relevant here.

Obligations (score = 2)

There are obligations to protect and sustainably manage species associated with coral reefs and mangroves within the Environmental Protection and Conservation Act [CAP 283], Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. Aver has been subject to customary management. A large number of fishes and invertebrates associated with coral reefs and mangroves are listed under CITES and on the IUCN Red List. Aver SUMA site includes the Losalava marine site, which is included in the NBSAP (2018–2030) as an existing marine fish breeding and tourism site as a national priority for formal protection through community management.

3.2.2.2 SITE T7: DIVERS’ BAY

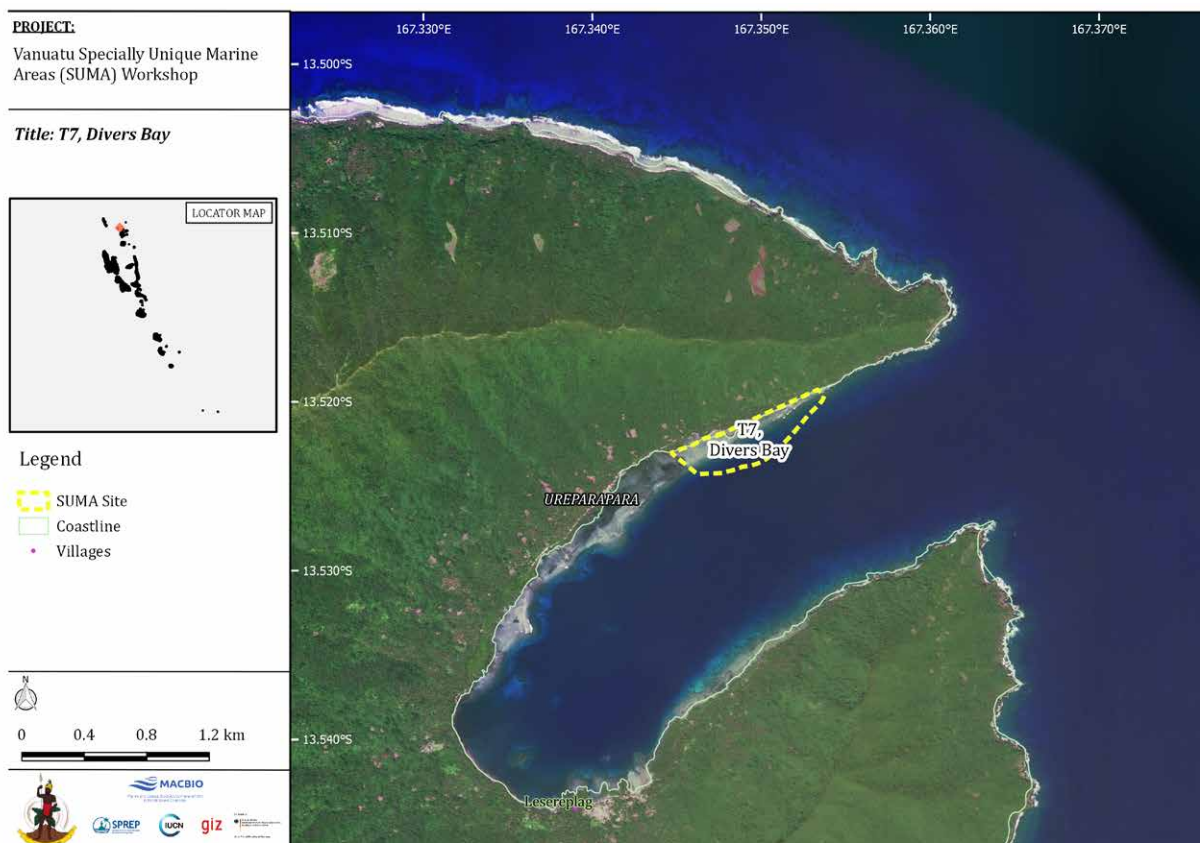


FIGURE 20. SITE T7: Divers’ Bay

TABLE 22. SITE T7: Divers' Bay. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Torba Province	Divers' Bay	T7	5

Geographic boundaries

13.523°S 167.3447°E, 13.5216°S 167.3545°E

Geographic description (score = 2)

Ureparapara Island is the third largest island in the Banks group of northern Vanuatu, after Gaua and Vanua Lava. Divers' Bay is an old volcanic cone that has been breached by the sea on the east coast of the island. The SUMA includes the shallow marine habitats along 1 km of the northern side of Divers' Bay.

Justification (score = 1)

Divers' Bay has high abundances of coral reef organisms that have been depleted elsewhere, especially finfish, trochus and green snails (Amos 2007). Early surveys reported that coral reefs around Ureparapara Island were in "outstanding" condition, but its current status is unknown (AIMS 2007). It is currently under protection as a fish nursery area (Government of Vanuatu 2016). Green snail (*Turbo marmoratus*) is highly prized in Melanesian subsistence fisheries; in Vanuatu it was fished nearly to extinction prior to a moratorium on its collection (UniQuest Pty Ltd 2010). Areas where it remains abundant indicate a healthy reef system that has retained at least some of its key invertebrate species. Adult trochus are grazers, performing an important role by keeping algal biomass low on structurally complex reef crests (Villanueva et al. 2013). They are also highly sought after by artisanal fisheries (Pakoa et al. 2013); this has makes healthy trochus populations rare and indicates a relatively healthy reef system.

Ureparapara Island has been recognised for its biodiversity and is included as one of the Key Biodiversity Areas of Vanuatu (USP 2012). Broader information about coral reefs in Vanuatu are reviewed in Site NO3: Vagtande Island.

Type and number of sources (score = 1)

Two reports mentioned this SUMA, and one report described some of the coral reef resources on Ureparapara Island. Two reports provided general information about trochus and green snails. Sources reviewed for Site NO3: Vagtande Island are also relevant here.

Obligations (score = 1)

There are obligations to protect and sustainably manage species associated with coral reefs within the Environmental Protection and Conservation Act [CAP 283] and Fisheries Management Act 2014. Ureparapara has been subject to customary management. Trochus is subject to size and quota restrictions. A large number of fishes and invertebrates associated with coral reefs are listed under CITES and on the IUCN Red List. Divers' Bay is included in the NBSAP (2018–2030) as an existing marine conservation site as a national priority for formal protection through community management.

3.2.2.3 SITE T8: REEF ISLANDS



FIGURE 21. SITE T8: Reef Islands

TABLE 23. SITE T8: Reef Islands. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Torba Province	Reef Islands	T8	8

Geographic boundaries

13.5845°S 167.5406°E, 13.6612°S 167.494°E

Geographic description (score = 1)

The Reef Islands, also called Rowa, are a cluster of coral cays forming an atoll between Vanua Lava and Ureparapara, in northern Vanuatu. The Reef Islands are enclosed by a large, horseshoe-shaped reef that protects an expansive lagoon with sandy shallows. The five small islands are mostly sand built up over reefs, and have been uninhabited since 1939. The SUMA includes all the shallow marine habitats around the atoll.

Justification (score = 2)

This SUMA was identified by workshop participants for its high abundances of coral reef organisms that have been depleted elsewhere, especially finfish, trochus and green snails, which have been restocked (Government of Vanuatu 2016). Anecdotal evidence suggests mullet are abundant (Wantok Environment Centre 2009a). Fisheries stock assessments reported high densities of some clam species (*Tridacna maxima* and *Hippopus hippopus*) and sea cucumbers (*Bohadschia argus*, *Holothuria nobilis*, *Actinopyga mauritiana*, *H. atra*, *H. leucospilota*) in the Reef Islands (Amos 2007).

The sand cays partially surround a shallow lagoon made up of sandy seabed, seagrass and coral patches (Chambers et al. 1990). This creates a mosaic of habitats that can support multiple stages in the life cycles of tropical marine organisms (Olds et al. 2016). Turtles and dugongs are also thought to occur here (V. Molisa, pers. comm.). The dugong (*Dugong dugon*) has a large range that spans some forty countries and includes tropical and subtropical coastal and island waters from east Africa to Vanuatu, coinciding with the distribution of seagrasses, which are the dugong's major food source

(Marsh et al. 2012). Dugongs are keystone herbivores of tropical and subtropical coastal ecosystems, and crucial to the dispersal of seagrasses (Tol et al. 2017). They are at high risk of local extinction in several parts of their range, due to human impacts such as direct exploitation, habitat loss, pollution and boat strike (Marsh and Sobotzick 2015). Dugong numbers have been estimated for 20 countries using aerial surveys, yet in the western Pacific region, information on dugong abundance is largely anecdotal (Cleguer et al. 2017). The dugong populations in Vanuatu are fragmented, and Vanuatu’s islands are thought to form the easternmost extent of the species’ range (Chambers et al. 1989). To date, only one survey has been carried out to assess the distribution, abundance, cultural importance and threats faced by dugongs in Vanuatu. This 1987 study, involving an aerial survey and postal questionnaire, indicated that small groups of dugongs are found from Aneityum to the Torres Islands (GEF-UNEP-CMS 2016).

The Reef Islands are listed as a conservation area in the NBSAP (2018–2030) (Government of Vanuatu 2016), and are included as one of the Key Biodiversity Areas of Vanuatu (USP 2012). General information about coral reefs, turtles, trochus and green snails in Vanuatu is reviewed in Site NO3: Vagtande Island, Site T4: Linua and Site T7: Divers’ Bay.

Type and number of sources (score = 2)

One website, one fisheries report, one peer-reviewed paper and the Key Biodiversity Areas report and Vanuatu’s NBSAP (2018–2030) provided information about the SUMA. One additional peer-reviewed paper offered information about the value of different habitats in close proximity; three reports and four peer-reviewed papers also offered information about dugongs in the SUMA, in Vanuatu and more generally. Sources reviewed for Site NO3: Vagtande Island, Site T4: Linua and Site T7: Divers’ Bay are also relevant here.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with coral reefs within the Environmental Protection and Conservation Act [CAP 283] and Fisheries Management Act 2014. The Reef Islands are protected from extractive activities. Trochus is subject to size and quota restrictions. A large number of fishes and invertebrates associated with coral reefs are listed under CITES and on the IUCN Red List. Reef Islands is included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for formal protection.

3.2.2.4 SITE T9: MOTA LAVA

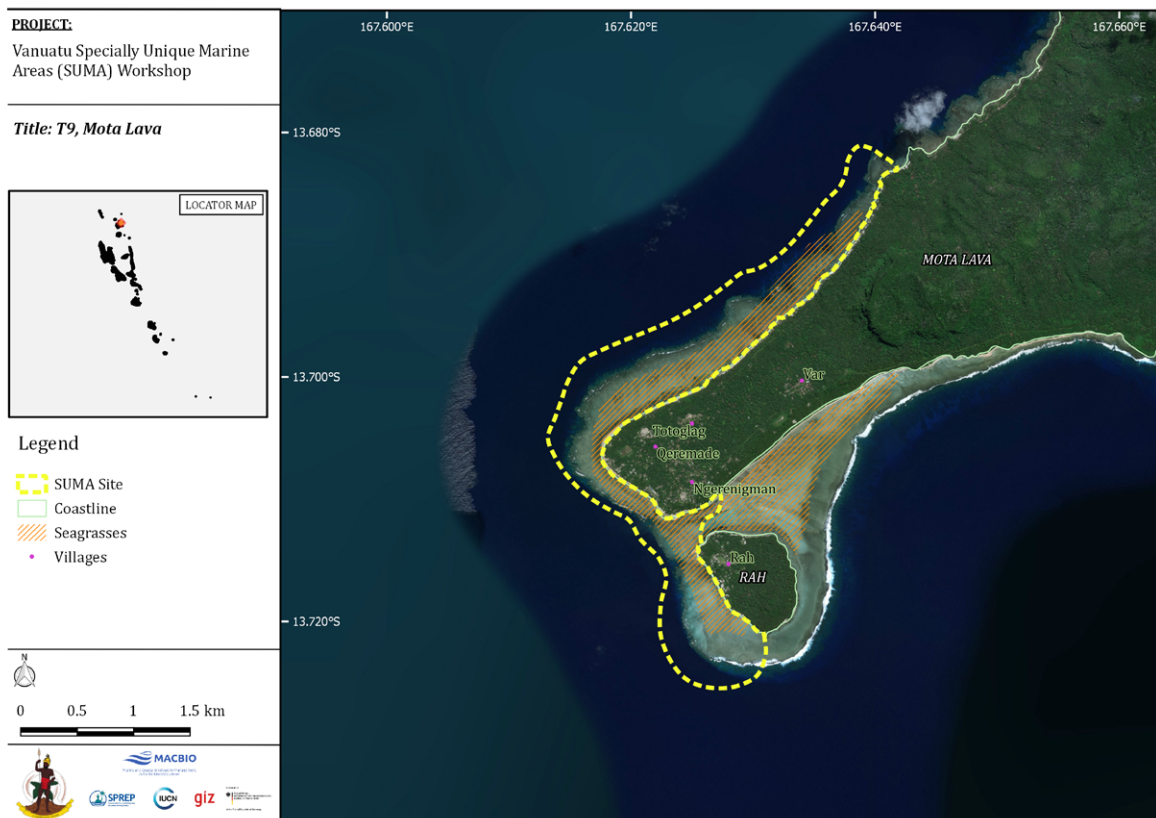


FIGURE 22. SITE T9: Mota Lava

TABLE 24. SITE T9: Mota Lava. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Torba Province	Mota Lava	T9	8.5

Geographic boundaries

13.7207°S 167.6089°E, 13.6819°S 167.6421°E

Geographic description (score = 2)

Mota Lava is the fourth largest island in the Banks Islands of Vanuatu, after Gaua, Vanua Lava and Ureparapara, with an area of 24 km². The islet of Ra (50 ha), 270 meters off its southern coast, is attached by a shallow area of coral reef flat. The SUMA encompasses the coral reef habitats around the western tip of Mota Lava and Ra.

Justification (score = 2)

This SUMA was identified by workshop participants for its high abundances of coral reef organisms that have been depleted elsewhere, especially finfish, lobsters, trochus and green snails (Raubani 2009). The soft-sediment habitats and tidal flats are also thought to have seagrass beds (V. Molisa, pers. comm.). There are a number of tabu areas in the SUMA, which have been traditionally managed for ten years: a tabu area off Ra Island, the Nereningman Village marine tabu area, the Totolag village marine tabu area, the Qeremagde village marine tabu area, and the Avar Village marine tabu area (Government of Vanuatu 2016). Mota Lava has been recognised for its biodiversity and is included as one of the Key Biodiversity Areas of Vanuatu (USP 2012).

Coral cover throughout the island was estimated at ~25% in 2007 (Chin et al. 2011), and pressure from human activities was estimated as being relatively low (Raubani 2009). Rapid coral reef assessments found coral assemblages in good condition, and a large number of grazing sea urchins that suggested overfishing of grazing fishes (Edney et al. 2013). While reef flats and shallow reef crests appeared somewhat storm-affected and depleted, the slope had populations of grey reef sharks (*Carcharhinus amblyrhynchos*), pinnate batfish, large parrotfish, schooling snapper, fusiliers and corallivores (Edney et al. 2013). Further information about Vanuatu’s coral reefs, seagrass beds, trochus and green snails more generally is reviewed for Site NO3: Vagtande Island, Site T4: Linua and Site T7: Divers’ Bay.

Type and number of sources (score = 2.5)

One report had qualitative information about coral reefs within the SUMA, and three reports provided further information about Mota Lava Island more generally. Three reports added general information about green snails and trochus in general. Vanuatu’s NBSAP (2018–2030) mentions the conservation value of the island, and sources reviewed for Site NO3: Vagtande Island, Site T4: Linua and Site T7: Divers’ Bay are also relevant here.

Obligations (score = 2)

There are obligations to protect and sustainably manage species associated with coral reefs and seagrass beds within the Environmental Protection and Conservation Act [CAP 283] and Fisheries Management Act 2014. There are a number of tabu areas in the SUMA: a tabu area off Ra Island, the Nereningman Village marine tabu area, the Totolag village marine tabu area, the Qeremagde village marine tabu area, and the Avar village marine tabu area. Trochus is subject to size and quota restrictions. A large number of fishes and invertebrates associated with coral reefs and seagrass beds are listed under CITES and on the IUCN Red List. The Mota Lava SUMA includes Rah Island marine site, which is included in the NBSAP (2018–2030) as an existing marine fish breeding and tourism site as a national priority for formal protection through community management.

3.2.2.5 SITE Q1: QUANLAP

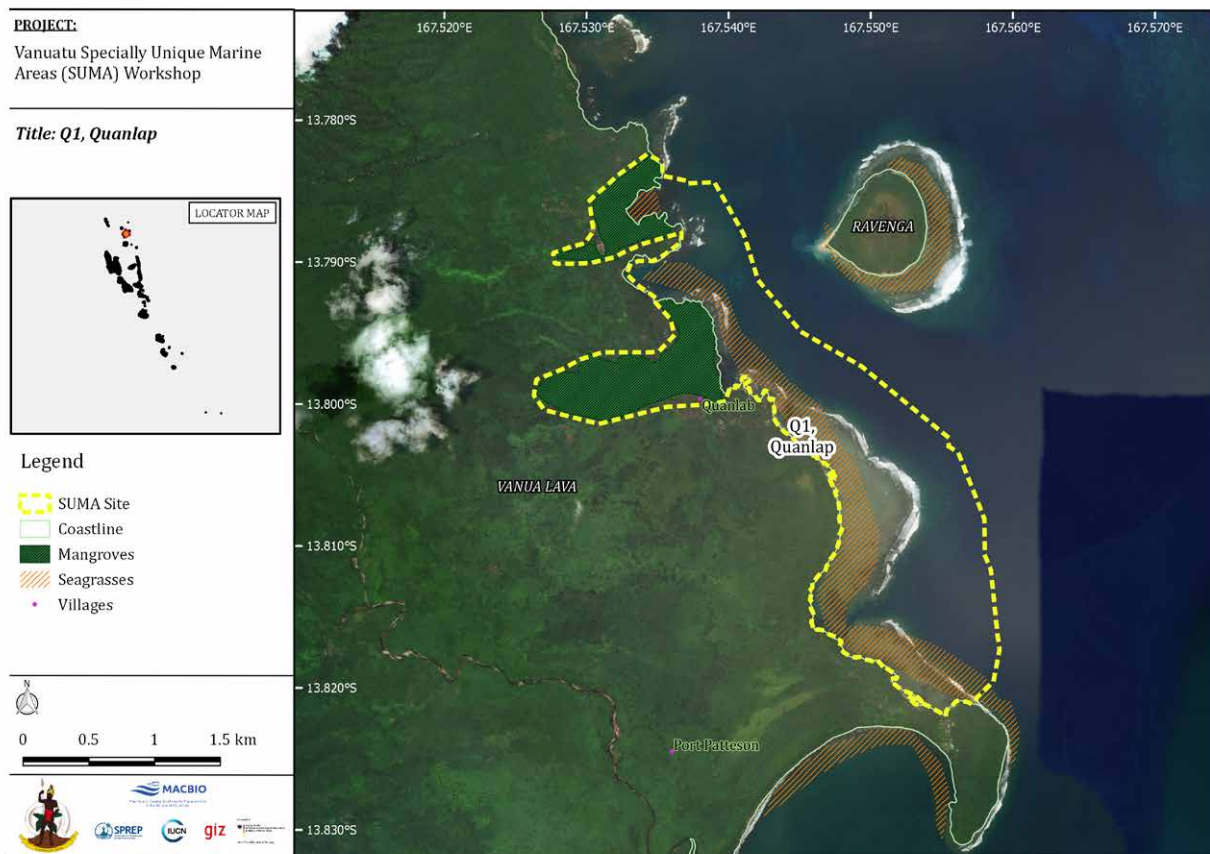


FIGURE 23. SITE Q1: Quanlap

TABLE 25. SITE Q1: Quanlap. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Torba Province	Quanlap	Q1	11

Geographic boundaries

13.7815°S 167.5353°E, 13.8279°S 167.5483°E

Geographic description (score = 3)

This SUMA lies on the northeastern coast of Vanua Lava Island, the second largest island in the Banks Islands. The site is characterised by a wide, shallow reef flat. The SUMA is the beach, mangroves and the reef area fringing approximately 3.5 km of coastline and just over 1 km out to sea.

Justification (score = 2)

This SUMA is an important area for turtles; the extensive seagrass bed is a feeding ground for approximately 100 – 200 green and hawksbill turtles, and nesting is known to take place here (two identified nests 2017 – workshop pers. comm.) (Siota 2015). Information collected at Wan Smolbag workshops in 2007 and 2008 by monitors of the Vanua-Tai network recorded evidence of nests for both species (Maison et al. 2010). The mangrove wetlands include seagrass beds and provide vital nursery habitat for fishes and crustaceans.

Five turtle species are found in Vanuatu, including (in order of declining abundance) hawksbill turtle (*Eretmochelys imbricata*), green turtle (*Chelonia mydas*), leatherback turtle (*Dermochelys coriacea*), loggerhead turtle (*Caretta caretta*) and olive ridley turtle (*Lepidochelys olivacea*). Vanuatu has at least three nesting beaches that are of regional importance for leatherback turtles (Dutton et al. 2007). Some of these turtles migrate long distances within and between Pacific

Island regions; records show movements of hawksbill turtles between Australia and Vanuatu of almost 2,500 km (Miller et al. 1998) and movement of green turtles among the western Pacific island groups (Read et al. 2015). Nesting sites in Vanuatu are therefore likely to be of importance to the wider region.

Vanua Lava has 35 ha of mangroves, most of which is concentrated within this SUMA (Amos 2007). The mangrove forest is 15–20 m high and has among the highest diversity of mangrove trees in Vanuatu (Kalfatak and Jaensch 2014). The mangrove wetlands provide vital nursery habitat for fishes and crustaceans, and possibly also juvenile crocodiles (see below); this is one of the few such habitats, and the largest, in Vanua Lava (Kalfatak and Jaensch 2014). The general distribution and status of mangrove and seagrass ecosystems in Vanuatu is reviewed in Site T4: Linua.

Vanuatu is the easternmost point of the distribution of estuarine crocodile, *Crocodylus porosus* (Kalfatak and Jaensch 2014). Vanua Lava is the only island in Vanuatu with a breeding population of crocodiles (Amos 2007), making this SUMA nationally unique. It is thought that the crocodile population on Vanua Lava is a natural extension of the range of crocodile populations of the Solomon Islands (Chambers and Esrom 1989; Messel and King 1992); crocodile populations on Nendo and Vanikoro islands in the Solomon Islands are only some 250 to 300 km to the northwest of Vanua Lava, which is within swimming distance (Amos 2007). Past surveys (1992) reported that Vanua Lava's crocodile population was close to extinction (Kalfatak and Jaensch 2014); the fact that at least two individuals were recently observed (workshop pers. comm.) suggests that this may be a resilient population.

The saltwater crocodile is considered the largest of the living crocodylians, with reported lengths of up to 6–7 m, and is one of the most widely distributed of all crocodylians (Webb et al. 2010). It is a versatile apex predator likely to remove prey from a variety of trophic levels and food webs (Hanson et al. 2015). This makes them an important keystone predator and an indicator species for ecosystem health both in estuarine waters and the adjacent marine environment (Evans et al. 2016).

Type and number of sources (score = 3)

One report describes attributes of the SUMA directly, and two reports provided information about Vanua Lava in general. Data and one report were available about activities of turtles in Vanuatu that may be relevant to the site. For further information about crocodiles, seagrass beds and turtles, two reports and six peer-reviewed papers were consulted. Sources reviewed for Site T4: Linua are also relevant here.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with mangroves within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. Turtles, crocodiles and some fishes and invertebrates associated with mangroves are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles and crocodiles are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. Quanlap SUMA site includes Quanlap marine tabu area which is included in the NBSAP (2018–2030) as an existing turtle nesting site as a national priority for formal protection through community management.

3.2.3 Inshore: Sanma Province: Espiritu Santo Island

These regions consist of Santo, Malo and outer islands (Sanma).

3.2.3.1 SITE S1: PALEKULA TO TURTLE BAY

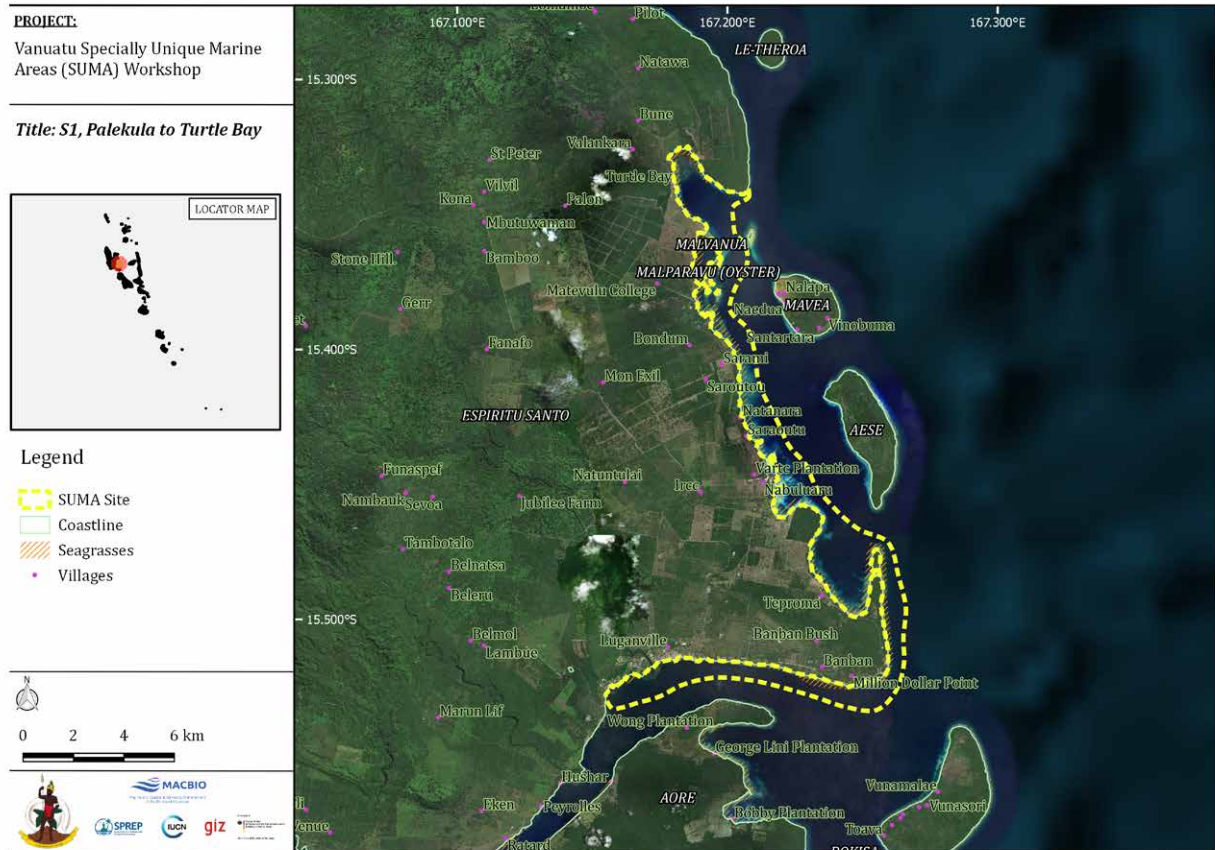


FIGURE 24. SITE S1: Palekula to Turtle Bay

TABLE 26. SITE S1: Palekula to Turtle Bay. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Sanma Province	Palekula to Turtle Bay	S1	12

Geographic boundaries

15.5327°S 167.1544°E, 15.3366°S 167.2864°E

Geographic description (score = 3)

Espiritu Santo Island, usually referred to as Santo, is the largest island in Vanuatu, covering 4,010 km². This SUMA extends along 34 km on the east coast of Santo Island, from the south-facing Turtle Bay in the north to Luganville in the south. It includes estuaries, mangroves and fringing reefs directly off the coast, but does not extend to the small islands offshore (Mavia and Aesi).

Justification (score = 3)

In 2006, a multidisciplinary group of over 150 expert scientists conducted an extensive expedition of Santo's terrestrial, freshwater and marine habitats, which resulted in a large body of work ranging from descriptions of new species to studies on interactions between human inhabitants and the environment (Bouchet et al. 2011). Most marine locations around the island received at least some sampling effort, making this perhaps Vanuatu's best-studied island.

The estuaries, mangroves, seagrass beds and fringing reefs in this SUMA form a rich, interconnected wetland system and have the potential to support high biodiversity. South-east Santo has the greatest mangrove development on the island, especially where small islands, just offshore, dissipate the ocean's energy and allow the accumulation of sediments on the mainland in their lee (Plaziat and Lozouet 2011). Small estuarine creeks and lagoon-like indentations in the coastline have also allowed for some mangrove development. The mangrove forest here is of intermediate diversity, dominated by the genera *Rhizophora*, *Sonneratia* and *Avicennia*, and to a lesser extent by *Bruguiera*, *Xylocarpus* and *Acanthus*. The highest biodiversity in the mangrove fauna is found at the boundaries between habitats; either between the mangroves and marine habitats, or between the mangroves and adjacent terrestrial habitats. For example, there is a diversity of Terebrid gastropods and associated sea stars around Belmoul lagoon. The mangroves of the Vanuatu archipelago provide a significant benchmark in the general gradient between the biodiversity core of the Coral Triangle and the more impoverished western Pacific flora and fauna (Plaziat and Lozouet 2011).

Seagrass and macroalgal surveys reported rich algal beds, with less seagrass development (Payri 2011). Generally, only the fringing sandy flats adjacent to estuarine and river catchments, sheltered embayments and inner reef sandy flats provide the necessary conditions for seagrass development around Santo. Deep sandy slopes, sandy channel slopes and bottoms support *Halophila* species. In a survey of the broader area that includes this SUMA (Turtle Bay to Urelapa, including the islands), eight species of seagrass were recorded (*Cymodocea rotundata*, *C. serrulata*, *Halodule uninervis*, *Enhalus acoroides*, *Halophila capricorni*, *H. decipiens*, *H. ovalis* and *Thalassia hemprichii*) growing in scattered patches rather than large meadows. Four were new records for Santo: *C. serrulata*, *E. acoroides*, *H. capricorni* and *H. decipiens*; the two species of *Halophila* were new records for the Vanuatu archipelago.

Coral reefs around Santo Island are thought to be more resistant to high water temperatures than reefs elsewhere in Vanuatu, suggesting that they may serve as refuges in future (Klint et al. 2017). Coral communities on the outer slopes tend to be typical of oceanic environments, due to the steep depth gradients (Done and Navin 1990). Marine areas where seagrass, mangrove and coral reef habitats exist in close proximity are especially valuable, as many species use more than one of these habitats during their life cycle (Mumby et al. 2004). For example, emperors (Lethrinidae) settle into seagrass beds as juveniles, and the move to coral reef habitats as they mature. Seascape connectivity is known to enhance the effectiveness of marine protected areas by protecting species' entire life cycles and the transition zones between critical habitats (Olds et al. 2016). The value of this SUMA is greatly enhanced by the proximity of these three important ecosystems.

Dugongs have been recorded in the SUMA, in various groups of between three and 10 (Chambers et al. 1989), and habitat mapping suggests that this area is of medium to high priority for dugongs (VESS 2017). For more information about dugongs in Vanuatu, see Site T7: Divers' Bay

Workshop participants also suggested that this area may be suitable for a shark sanctuary, but no additional information was found about the presence of sharks in this area. Twenty-one species of sharks and rays (Table 27) are known (albeit through inshore fisheries catch data) to reside in Vanuatu's waters; also cat sharks (*Scyliorhinus torazame*) and shortspine spurdogs (*Squalus mitsukurii*) (Amos 2007).

TABLE 27. Shark species caught in Vanuatu by fisheries.

Listed in order of decreasing incidence in catch or bycatch data. Classification for the IUCN Red List of Threatened Species: LC: Least Concern; NT: Near Threatened; VU: Vulnerable; EN: Endangered. Presence of the species in CITES Appendix given, and listing the CMS (y = yes). Vanuatu Fisheries Department (2015). See also Appendix 5: List of species known to occur in Vanuatu with international and national obligations.

Species	Common name	IUCN	CITES	CMS
<i>Carcharhinus falciformis</i>	Silky shark	NT		
<i>Prionace glauca</i>	Blue shark	NT		
<i>Carcharhinus longimanus</i>	Oceanic whitetip shark	VU	II	
<i>Pteroplatytrygon violacea</i>	Pelagic stingray	LC		
<i>Isurus oxyrinchus</i>	Short finned mako	VU		y
<i>Isurus paucus</i>	Long finned mako	VU		y
<i>Sphyrna mokarran</i>	Great hammerhead	EN	II	
<i>Sphyrna zygaena</i>	Smooth hammerhead	VU	II	
<i>Alopias superciliosus</i>	Bigeye thresher	VU		
<i>Alopias pelagicus</i>	Pelagic thresher	VU		
<i>Carcharhinus albimarginatus</i>	Silvertip shark	NT		
<i>Carcharhinus brachiurus</i>	Brone whaler shark	NT		
<i>Carcharhinus limbatus</i>	Blacktip shark	NT		
<i>Galeocerdo cuvier</i>	Tiger shark	NT		
<i>Carcharhinus galapagensis</i>	Galapagos shark	NT		
<i>Carcharhinus amblyrhynchos</i>	Grey reef shark	NT		
<i>Carcharhinus melanopterus</i>	Blacktip reef shark	NT		
<i>Carcharhinus plumbeus</i>	Sandbar shark	VU		
<i>Manta birostris</i>	Giant manta	VU	II	
<i>Manta spp.</i>	Manta rays (unid.)	VU	II	
<i>Carcharodon carcharias</i>	Great white shark	VU	II	y

High densities of sharks are considered a sign of a healthy marine ecosystem. Top predators are typically the first to disappear from marine ecosystems under any degree of fishing pressure, as they are preferentially targeted by most fisheries and/or killed by fishermen when caught as by-catch (Friedlander and DeMartini 2002; Sandin et al. 2008; Graham et al. 2010; Hisano et al. 2011). Their high commercial value combined with their K-selected life-history (slow growth, late maturity, low fecundity) reduces productivity of apex predators and inhibits recovery of exploited populations under continued fishing pressure (Pauly et al. 1998; Stevens et al. 2000; Collette et al. 2011). In some habitats, anthropogenic impacts have reduced the abundance of apex predators by 90 % or more (Myers and Worm 2003). The removal of apex predators may result in trophic cascades, with changes occurring throughout the food web, sometimes down to primary producers (Estes et al. 2011). Areas with high local abundance of sharks, such as potentially this SUMA, are becoming more valuable as sanctuaries where food webs remain intact.

Type and number of sources (score = 3)

Sources for this SUMA include The Natural History of Santo book resulting from the Santo 2006 expedition, and more specifically, two chapters from the book. One report and three peer-reviewed papers were used to describe the value of ecosystem connectivity. Information about sharks in Vanuatu was drawn from one fisheries report and the NPOA, and general information about sharks was reviewed from nine peer-reviewed papers.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with seagrass beds and mangroves within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. Dugongs, sharks and a large number of fishes and invertebrates associated with seagrass beds and mangroves are listed under CITES and on the IUCN Red List. Vanuatu has a National Plan of Action (NPOA) on Sharks (2015–2018). Palekula to Turtle Bay SUMA site includes Sarakata River, PB Wharf, college De Santo, Rotary Park and Samansin Wharf Marine area which is included in the NBSAP (2018–2030) as a proposed marine site as a national priority for formal protection.

3.2.3.2 SITE S2: HOG HARBOUR AND PORT ORLY CONSERVATION AREA

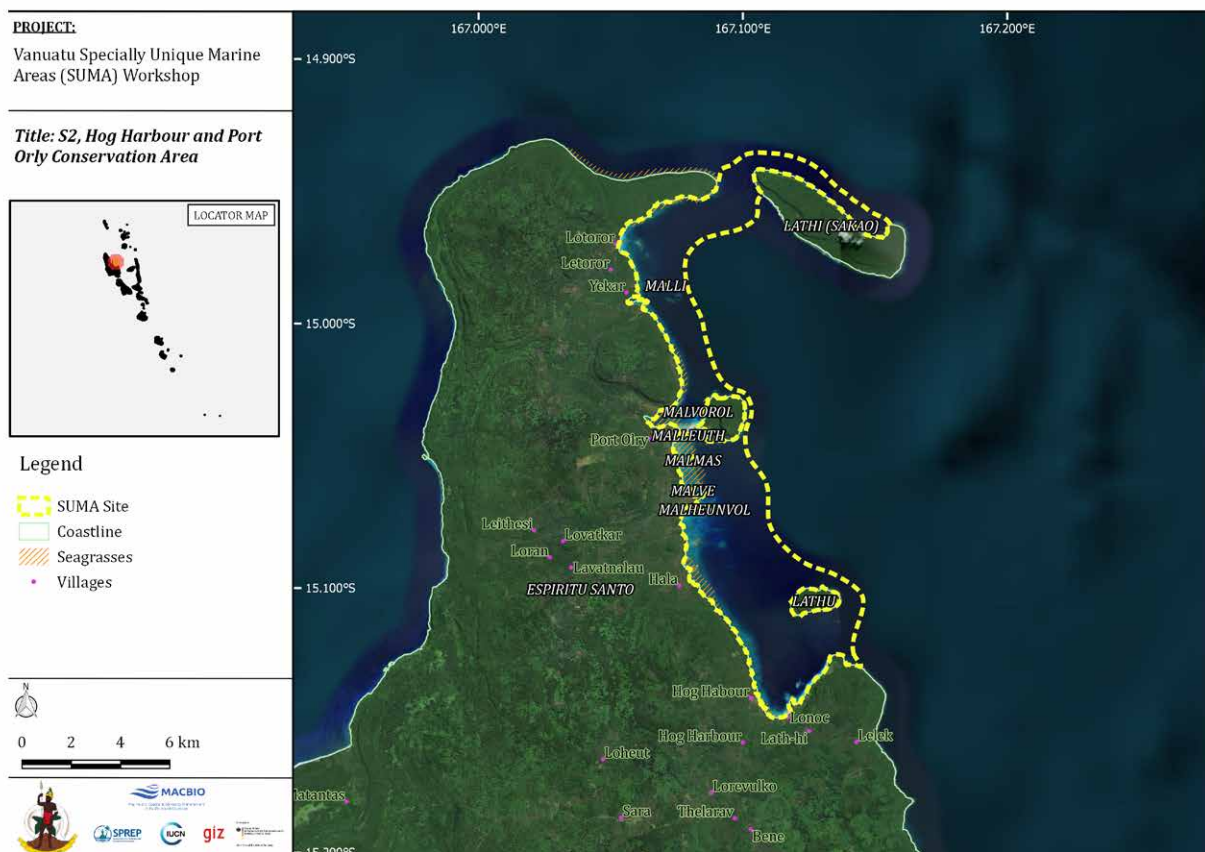


FIGURE 25. SITE S2: Hog Harbour and Port Orly Conservation Area

TABLE 28. SITE S2: Hog Harbour and Port Orly Conservation Area. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Sanma Province	Hog Harbour and Port Orly Conservation Area	S2	10

Geographic boundaries

15.1444°S 167.0414°E, 14.9387°S 167.1572°E

Geographic description (score = 3)

This SUMA lies on the eastern coast of Santo Island and stretches from the northern coast of Sakau Island to Hog Harbour, including all the shallow and intertidal marine habitats along the coast and around the islands just offshore.

Justification (score = 2)

Workshop participants determined this area to be of high conservation significance for its mangrove forests and a variety of marine species, including turtles, passing whales and breeding fish. The mangrove habitats of southeastern Santo were described in Site S1: Palekula to Turtle Bay; mangroves in this SUMA are likely to be similar. This part of the east coast of Santo has been recognised for its biodiversity and is included as one of the Key Biodiversity Areas of Vanuatu (USP 2012). An early survey reported a dense assemblage of coral thickets and mounds on a sandy slope on the western side of the island, and exceptional community of robust branching corals on the steep limestone southern face of the island (Done and Navin 1990).

Green turtles have been observed foraging in the waters off Orly Village and Hog Harbour, and leatherback turtles are known to nest in the SUMA (Siota 2015). Overall, Santo has records of nests from four species of turtles: green, hawksbill, leatherback and loggerhead (Wan Smolbag data), and is said to host at least 50 green turtle nests per year (Maison et al. 2010). Shallow mangrove habitats are known as important breeding and nursery areas for many species of fishes and invertebrates, and coconut crabs are known to occur here (Vanuatu Fisheries Department 2013a).

Very little information was available about whales in Vanuatu, making it difficult to confirm the importance of this SUMA to passing whales. Eight species of cetaceans are known to be present in Vanuatu, confirmed through strandings and sightings (Table 29). For example, Vanuatu's EEZ is thought to host 'noticeable concentrations' of Bryde's whales, large aggregations of sperm whales and humpback whales, and pantropical spotted dolphins (Miller 2007).

TABLE 29. Summary of cetacean species recorded in Vanuatu waters.

From Miller (2007). Classification for the IUCN Red List of Threatened Species: LC: Least Concern; DD: Data Deficient; VU: Vulnerable. CITES and CMS listing shown. See also Appendix 5: List of species known to occur in Vanuatu with international and national obligations.

Species	Common name	IUCN	CITES	CMS
<i>Megaptera novaeangliae</i>	Humpback whale	LC	I	I
<i>Globicephala macrorhynchus</i>	Short-finned pilot whale	DD	II	
<i>Orcinus orca</i>	Orca	DD	II	II
<i>Peponocephala electra</i>	Melon-headed whale	LC	II	
<i>Stenella attenuata</i>	Pantropical spotted dolphin	LC	II	II
<i>Stenella longirostris</i>	Spinner dolphin	DD	II	II
<i>Tursiops sp.</i>	Bottlenose dolphin	LC	II	I/II
<i>Physeter macrocephalus</i>	Sperm whale	VU	I	I/II
<i>Balaenoptera sp.*</i>	Bryde's whale	DD	I	II
<i>Stenella coeruleoalba*</i>	Striped dolphin	LC	II	II

*Unconfirmed in Vanuatu waters

Type and number of sources (score = 2)

One report provided information about turtles nesting and foraging in this SUMA, one report had general information on green turtle nests on Santo Island, and the Wan Smolbag database gave locations of nesting turtles throughout Santo Island. The coconut crab management plan lists this as one of the areas where they are harvested. One report provides information about cetaceans in Vanuatu, one described the coral reefs, and one lists this area as one of Vanuatu's Key Biodiversity Areas. Sources used for Site S1: Palekula to Turtle Bay are also relevant here.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with seagrass beds and mangroves within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. Coconut crabs are provided for under the Vanuatu National Coconut Crab Fishery Management Plan. Turtles and a large number of fishes and invertebrates associated with seagrass beds and mangroves are listed under CITES and on the IUCN Red List. Turtles and marine mammals are listed under CITES and on the IUCN Red List (green

turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles are Vulnerable; sea table for cetacean listings). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. Hog Harbour and Port Orly Conservation Area SUMA site includes Port Orly and Hog Harbor Marine conservation areas which is included in the NBSAP (2018–2030) as a proposed marine site as a national priority for formal protection.

3.2.3.3 SITE S3: VATHE-LOATHE URERURE



FIGURE 26. SITE S3: Vathe-loathe Urerure

TABLE 30. SITE S3: Vathe-loathe Urerure. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Sanma Province	Vathe-loathe Urerure	S3	9.5

Geographic boundaries

15.1662°S 166.8597°E, 15.0532°S 167.0359°E

Geographic description (score = 3)

This SUMA extends along approximately 22 km of the south-eastern corner of Big Bay on Santo Island, and includes marine habitats to 1 km out to sea. This area includes fringing coral reefs and the intertidal lower reaches of the Jordan River and associated floodplains.

Justification (score = 1.5)

The estuary and habitats associated with the Jordan River are considered wetlands of national significance in Vanuatu; it is already protected within the Vathe Conservation Area (Kalfatak and Jaensch 2014). This area has been recognised internationally for its biodiversity and is included as one of the Key Biodiversity Areas of Vanuatu (USP 2012). It is likely that mangrove and seagrass communities in this area are similar to those described for Site S1: Palekula to Turtle Bay. Additionally, bull sharks (*Carcharhinus leucas*) are known to reside in the estuary (Kalfatak and Jaensch 2014).

Green, hawksbill, loggerhead and leatherback turtles nest throughout Santo Island beaches (Wan Smolbag data); the nests on the black sand beaches of this SUMA are most probably from leatherback turtles (Amos 2007). More information on turtles in Vanuatu is reviewed in Site Q1: Quanlap.

Coconut crabs have been recorded in the SUMA (Kalfatak and Jaensch 2014). More information about coconut crabs is available at Site T1: Metoma Island.

The coral reef of Santo Island in general are considered among those most at risk from various human pressures (Chin et al. 2011); workshop participants highlighted the presence of healthy coral reefs in this area, typical of a sheltered embayment (Corbara 2009). Coral surveys in 1990 reported sheltered coral reefs with relatively low diversity (Veron 1990). There is no further direct information about coral reefs in this SUMA, but coral reefs in Vanuatu generally were reviewed in Site NO3: Vagtande Island.

Type and number of sources (score = 2)

Four reports and two peer-reviewed papers contained information about this SUMA. The Wan Smolbag database gave locations of nesting turtles throughout Santo Island, and one report classified the degree of risk from human impacts to coral reefs in Santo generally. Sources used for Site NO3: Vagtande Island, Site Q1: Quanlap and Site S1: Palekula to Turtle Bay are also relevant here.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with coral reefs and mangroves within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. Coconut crabs are provided for under the Vanuatu National Coconut Crab Fishery Management Plan. Turtles and a large number of fishes and invertebrates associated with coral reefs and mangroves are listed under CITES and on the IUCN Red List. Turtles are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Vathe-loathe Urerure SUMA includes the nationally registered Vathe CCA, which is a nationally registered CCA. The CCA protected marine area boundary extends to the edge of the reef.

3.2.3.4 SITE S4: KEVIN ANDERSON



FIGURE 27. SITE S4: Kevin Anderson

TABLE 31. SITE S4: Kevin Anderson. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Sanma Province	Kevin Anderson	S4	8

Geographic boundaries

15.577°S 167.021°E, 15.6153°S 167.1146°E

Geographic description (score = 2)

The name of this SUMA refers to the Kevin Anderson Plantation, but the area of interest is a ~10 km stretch of inshore marine habitats on the southern coast of Santo Island. It includes mangroves and fringing reefs from Tangisi Island to just west of Rata Village.

Justification (score = 1.5)

This area was chosen for its mangroves, seagrass beds and associated breeding and nursery areas for fishes and invertebrates, and especially high densities of coconut crabs, green snails, trochus and sea cucumbers, which have all been depleted throughout the western Pacific.

The mangroves in this SUMA have developed on rocky tidal flats, where the uplifted holocene reefs have been eroded (Cabioch et al. 2003), resulting in sand pockets where the stilt roots of *Rhizophora* spp. can take hold (Plaziat and Lozouet 2011). More information about mangroves in Vanuatu in general, and Santo in particular, is available for Site T4: Linua and Site S1: Palekula to Turtle Bay; general information about coconut crabs, green snails and trochus can be found in Site T1: Metoma Island and Site T7: Divers' Bay.

Santo Island is one of the few areas in Vanuatu that hosts significant coconut crab populations; green snails and sea cucumbers are also considered to be overexploited elsewhere in Vanuatu and also elsewhere in Santo (Amos 2007). Sea cucumber stocks on the eastern coast of Santo were considered depleted even 5 years after a moratorium, with some species suspected to be locally extinct (Vanuatu Fisheries Department 2013b). This makes locations such as this SUMA, where they are protected or well-managed, valuable as potential sources of larvae for exploited areas nearby.

Type and number of sources (score = 1.5)

Two reports referred to the SUMA directly, and two reports had information about Santo Island in general that could be used to infer the values of the SUMA. Sources used for Site T1: Metoma Island, Site T4: Linua, Site T7: Divers' Bay and Site S1: Palekula to Turtle Bay are also relevant here.

Obligations (score = 3)

Management regulations exist for coconut crabs on Santo Island, including a catch quota and a closed season; sea cucumbers have been subject to a moratorium. "Kevin Anderson Plantation" is listed as a marine area under private protection in Vanuatu's NBSAP (2018–2030) it is in the process to becoming a formally registered CCA. Trochus is subject to size and quota restrictions. There are obligations to protect and sustainably manage species associated with mangroves and seagrass beds within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. A large number of fishes and invertebrates associated with mangroves, including some sea cucumbers, are listed under CITES and on the IUCN Red List.

3.2.3.5 SITE S5: LOLITZ – PELMOL CONSERVATION

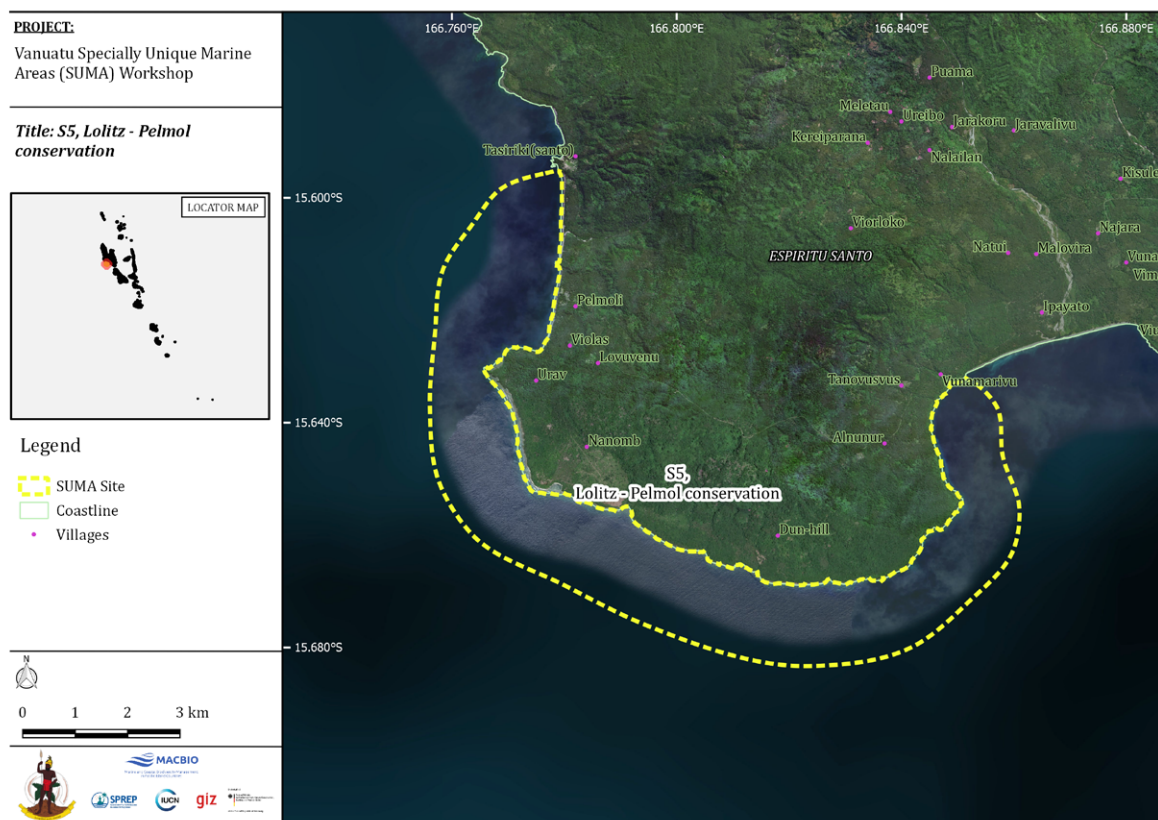


FIGURE 28. SITE S5: Lolitz – Pelmol Conservation

TABLE 32. SITE S5: Lolitz – Pelmol Conservation. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Sanma Province	Lolitz – Pelmol Conservation	S5	6

Geographic boundaries

15.5904°S 166.7697°E, 15.7004°S 166.8407°E

Geographic description (score = 2)

This SUMA includes the marine habitats surrounding a large headland at the southwestern corner of Santo Island, and extends from Pelmol Village at the western end to Lolitz at the eastern end. It is highly exposed to the prevailing southeasterly wind and swell. The underwater topography descends abruptly into deep water.

Justification (score = 1)

Workshop participants indicated that this SUMA is likely to be rich in pelagic fishes. The abrupt topography of the coral reef drop-off around the headland attracts aggregations of pelagic fishes that seek out such areas to feed or spawn, and deep-water fishes aggregate relatively close to shore. The interaction between hydrodynamics and topography creates patches of high productivity that attracts pelagic species from all trophic levels. The coral reef itself is likely to be productive and diverse in this high-energy environment. The main species of pelagic predators likely to be present in deep coastal waters include dolphinfish (*Coryphaena hippurus*), rainbow runner (*Elegatis bipinnulata*), wahoo (*Acanthocybium solandri*), and barracuda (*Sphyraena* spp.) (Amos 2007). These active predators regulate the food web and influence the distribution and behaviour of their prey. Fisheries data show that catch per unit effort for deepwater fish species is intermediate around the headland (Cillauren et al. 2002), but there is no direct information about pelagic species in these waters.

Type and number of sources (score = 1)

Only one report was found that provided information about fisheries in this area, but it focused on deepwater species, rather than pelagic species. No further information was found about the coral reefs or pelagic fish populations.

Obligations (score = 2)

There are obligations to protect and sustainably manage deep-water and pelagic fish stocks within the Fisheries Management Act 2014. There are obligations to protect and sustainably manage species associated with coral reefs within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. A large number of fishes and invertebrates associated with coral reefs are listed under CITES and on the IUCN Red List.

3.2.4 Inshore: Sanma Province: Malo Island

3.2.4.1 SITE S6: MALO PASS

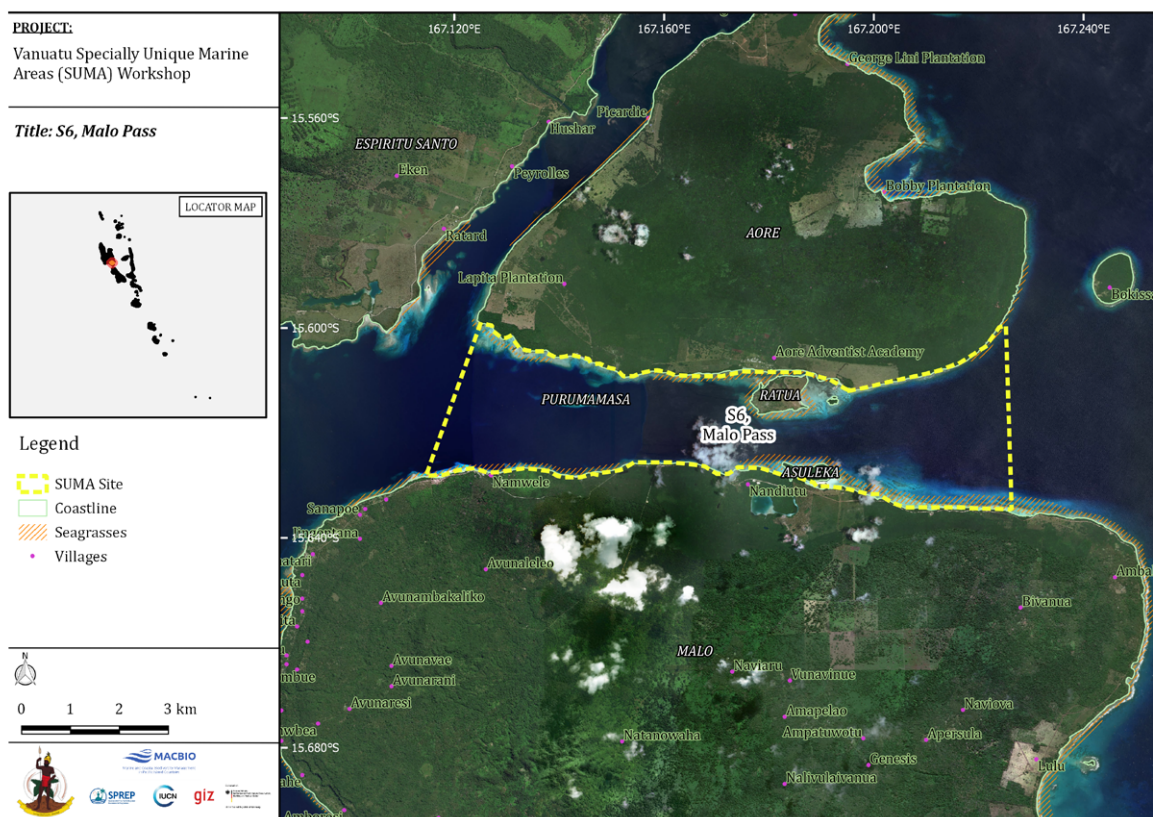


FIGURE 29. SITE S6: Malo Pass

TABLE 33. SITE S6: Malo Pass. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Sanma Province	Malo Pass	S6	8.5

Geographic boundaries

15.5991°S 167.1147°E, 15.6346°S 167.2263°E

Geographic description (score = 2)

Malo Pass is a narrow passage of just under 2 km across, approximately 14 km long, between Malo and Aore Islands. It is oriented east-west and fringed with mangroves, funnelling strong currents through the deeper areas between fringing reefs to the north and south. The SUMA includes the marine and intertidal areas in the pass on the northern coast of Malo Island, running along the length of the channel and 1 km out to sea.

Justification (score = 2)

The northern coast of Malo Island, at the Malo Pass, has mangrove habitats that provide breeding and nursery grounds for fishes, and habitat for sea cucumbers, dugongs and turtles. It is also an existing protected area (Government of Vanuatu 2016), indicating that sea cucumbers and other marine organisms, despite being depleted throughout other parts of Santo Island (Vanuatu Fisheries Department 2013b), may still occur in high density here. The qualities of mangrove ecosystems in Vanuatu are described more generally in Site T4: Linua.

The mangrove stand around the shallow intertidal inlet of Asuleka island, which lies within this SUMA, was considered to have special properties during the Santo 2006 Expedition (Plaziat and Lozouet 2011). *Rhizophora*, *Sonneratia* and *Bruguiera* spp. have formed a well-developed forest, but the gastropod fauna is poor. On sandbanks that emerge at low tide, a dense coral carpet, dominated by *Porites* spp. and *Montipora* spp., is mixed with patches of seagrass and the calcareous algae *Halimeda* spp. This assemblage extends to the *Rhizophora* spp. belt, so that the mangrove roots are anchored between living corals; mobile organisms (sea cucumbers, chitons, fish) form a unique link between these two very different habitats (Plaziat and Lozouet 2011). Mangroves and seagrasses also occur in close proximity to coral reefs, forming an interconnected mosaic of habitats described in Site S1: Palekula to Turtle Bay.

Type and number of sources (score = 1.5)

Three reports highlighted values directly associated with this SUMA, and one report described the attributes of the site for the Santo / Malo area more generally. Sources used for Site T4: Linua and Site S1: Palekula to Turtle Bay are also relevant here.

Obligations (score = 3)

This marine area is listed as having private protection in Vanuatu's NBSAP (2018–2030). There are obligations to protect and sustainably manage species associated with mangroves, seagrass beds and coral reefs within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. A large number of fishes and invertebrates associated with coral reefs, seagrass beds and mangroves, including some sea cucumbers, are listed under CITES and on the IUCN Red List. The Malo Pass SUMA includes Malo Pass marine conservation site, which is included in the NBSAP (2018–2030) as a proposed marine site as a national priority for formal protection.

3.2.4.2 SITE S7: MALO KILIKILI



FIGURE 30. SITE S7: Malo Kilikili

TABLE 34. SITE S7: Malo Kilikili. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Sanma Province	Malo Kilikili	S7	10

Geographic boundaries

15.694°S 167.2615°E, 15.7357°S 167.2462°E

Geographic description (score = 3)

Malokilikili is an island off the eastern coast of Malo Island, 1.4 km by 700 m, connected to Malo Island by an extensive reef flat and coral reef lagoon. The SUMA incorporates marine areas surrounding Malokilikili Island and Malotina Island just to the north, and all coral reef habitat between these two islands and the coast of Malo Island.

Justification (score = 2)

This SUMA holds the largest lagoon area on Malo Island, intact mangrove stands, extensive coral reefs, dugong habitat, and white sand beaches with turtle nesting areas.

Coral reefs in this SUMA were the site of some of the studies conducted by the Santo 2006 expedition and subsequent research programs, which yielded new species of invertebrates (Komatsu and Ng 2011; ter Poorten 2015; Galindo et al. 2017). These findings, as well as the diverse reef topography and large reef area, suggest a reef with potentially high biodiversity and productivity.

Mangrove habitats are described for other parts of Malo Island in Site S6: Malo Pass; mangrove values are likely to be similar here. Turtle monitoring has reported 22 turtle nests, but also that poaching is an issue in this area (Wan Smolbag Theatre 2010); from information about Malo Island in general (Siota 2015), these are likely to be green and hawksbill turtles. No information was found about dugongs in this area, but the presence and distribution of dugongs around Santo Island just to the north is described in Site S1: Palekula to Turtle Bay. Habitats and species in this SUMA (coral reefs, mangroves, turtles, dugongs) are described in more detail for all of Vanuatu in Site NO3: Vagtande Island, Site T4: Linua, and Site Q1: Quanlap.

Type and number of sources (score = 2)

Three peer-reviewed papers and one report mention this SUMA directly, but only in the context of listing sites for collecting organisms to study, rather than to provide descriptive information. One report revealed the number of turtle nests, and a more general report was used to infer the turtle species present. Sources used to describe Site NO3: Vagtande Island, Site T4: Linua, Site Q1: Quanlap, Site S1: Palekula to Turtle Bay and Site S6: Malo Pass are also relevant here.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with coral reefs and mangroves within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. Turtles, dugongs and a large number of fishes and invertebrates associated with coral reefs and mangroves are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles and dugongs are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles.

3.2.5 Inshore: Penama Province, Maewo Island

3.2.5.1 SITE P1: MAEWO MOON CAVE

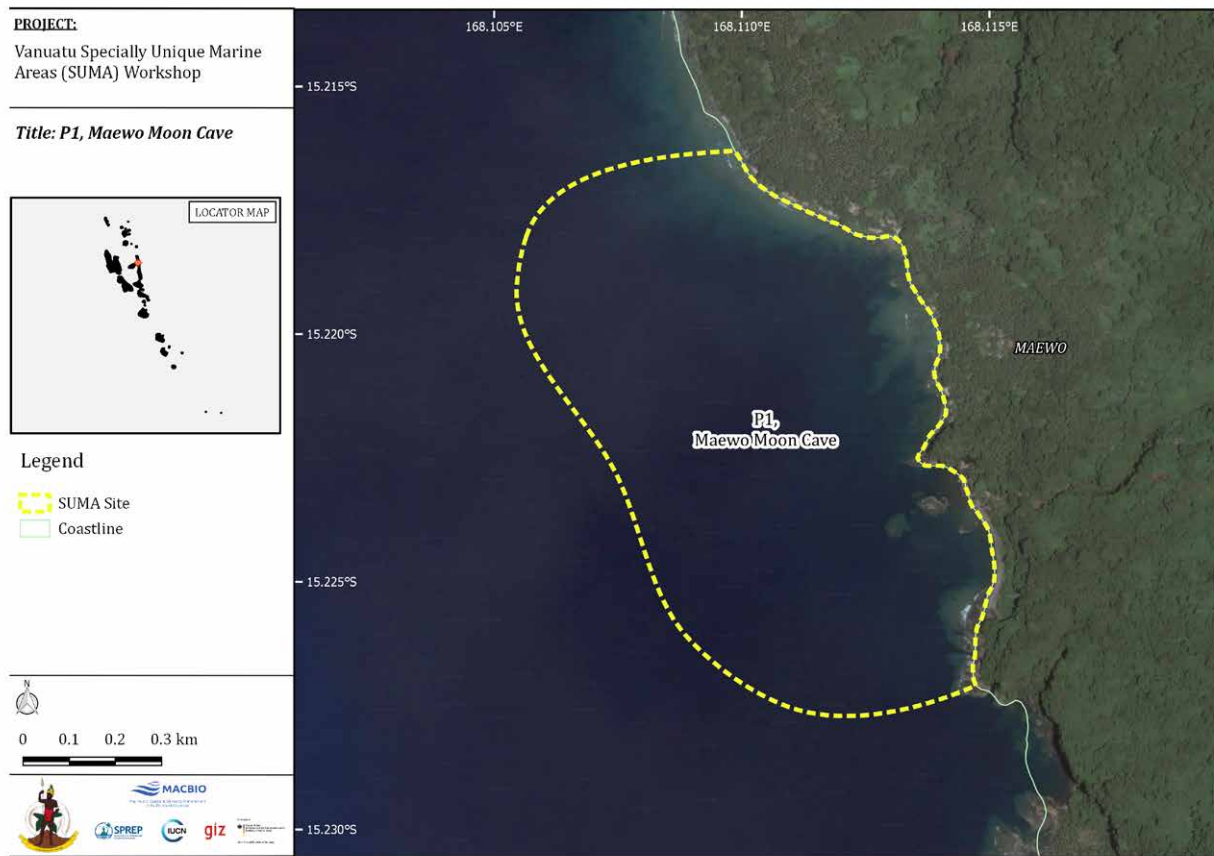


FIGURE 31. SITE P1: Maewo moon cave

TABLE 35. SITE P1: Maewo moon cave. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Penama Province	Maewo moon cave	P1	2.5

Geographic boundaries

15.2148°S 168.1118°E, 15.2293°S 168.1095°E

Geographic description (score = 1)

This SUMA lies on the western coast of Maewo Island. It extends for a little less than 1 km along the coastline and approximately 500 m out to sea.

Justification (score = 1)

This SUMA was chosen for its remarkable geological formations along the shoreline, which includes a large cave known as the Moon Cave (Tourism Department 2010). The cave is large enough for boats to enter (SV Fluenta 2017), and is characterised by the aquamarine colour of its waters and is said to have a “coral-lined” entrance (S/V Helios 2016a).

Type and number of sources (score = 0.5)

Two websites and one report mentioned this SUMA, but offered no description. Given the unique geophysical nature of this area, it is unlikely that sources used to describe other shallow marine SUMAs will apply here.

Obligations (score = 0)

Marine communities present in this SUMA are uncertain, as are the obligations to protect them.

3.2.5.2 SITE P2: SOUTH MAEWO

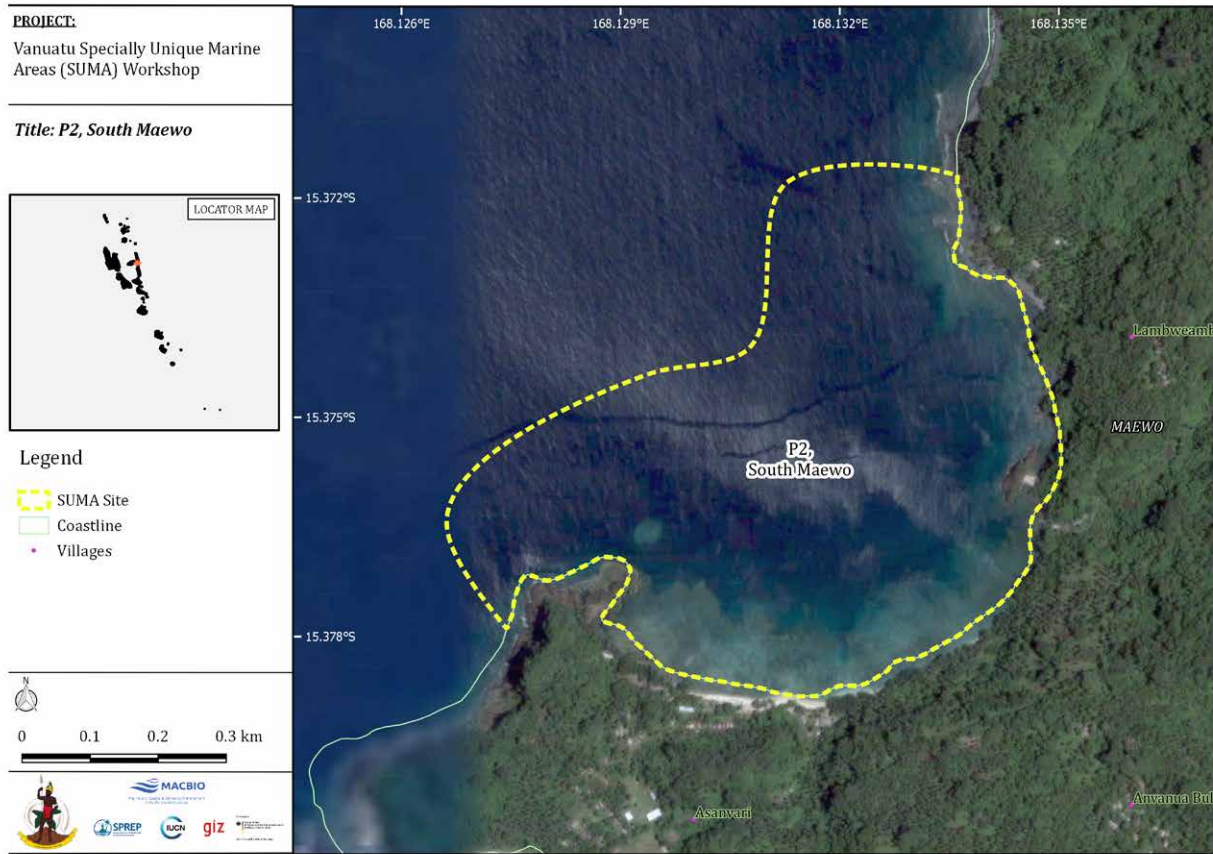


FIGURE 32. SITE P2: South Maewo

TABLE 36. SITE P2: South Maewo. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Penama Province	South Maewo	P2	6

Geographic boundaries

15.3765°S 168.1261°E, 15.3752°S 168.1368°E

Geographic description (score = 3)

One the southwestern coast of Maewo Island there is a slightly north-facing bay, next to Asanvari Village. The SUMA includes the entire bay out to approximately 800 m off the coast.

Justification (score = 1)

The sheltered bay off Asanvari village is known for its calm waters, which shelter shallow fringing coral reefs. Anecdotal reports from yachting websites suggest that the reefs are vibrant and diverse, including iconic anemonefishes, humphead wrasse and seasnakes (SV Bravo 2017). Reef topography varies from low-relief fringing reef within the bay, to steep drop-offs with gorgonian fans, that may attract pelagic species, towards the points (Vanuatu Cruising 2014a).

Further information about Vanuatu’s coral reefs generally is found in Site NO3: Vagtande Island.

Type and number of sources (score = 1)

Two websites had information about this SUMA's biophysical attributes. More generally, sources used to describe Vanuatu's coral reefs in Site NO3: Vagtande Island are also relevant here.

Obligations (score = 1)

There are obligations to protect and sustainably manage species associated with coral reefs within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. A large number of fishes and invertebrates associated with coral reefs are listed under CITES and on the IUCN Red. The South Maewo SUMA includes Asanvari marine conservation site, which is included in the NBSAP (2018–2030) as a proposed marine site as a national priority for formal protection.

3.2.5.3 SITE P3: NORTHEAST MAEWO

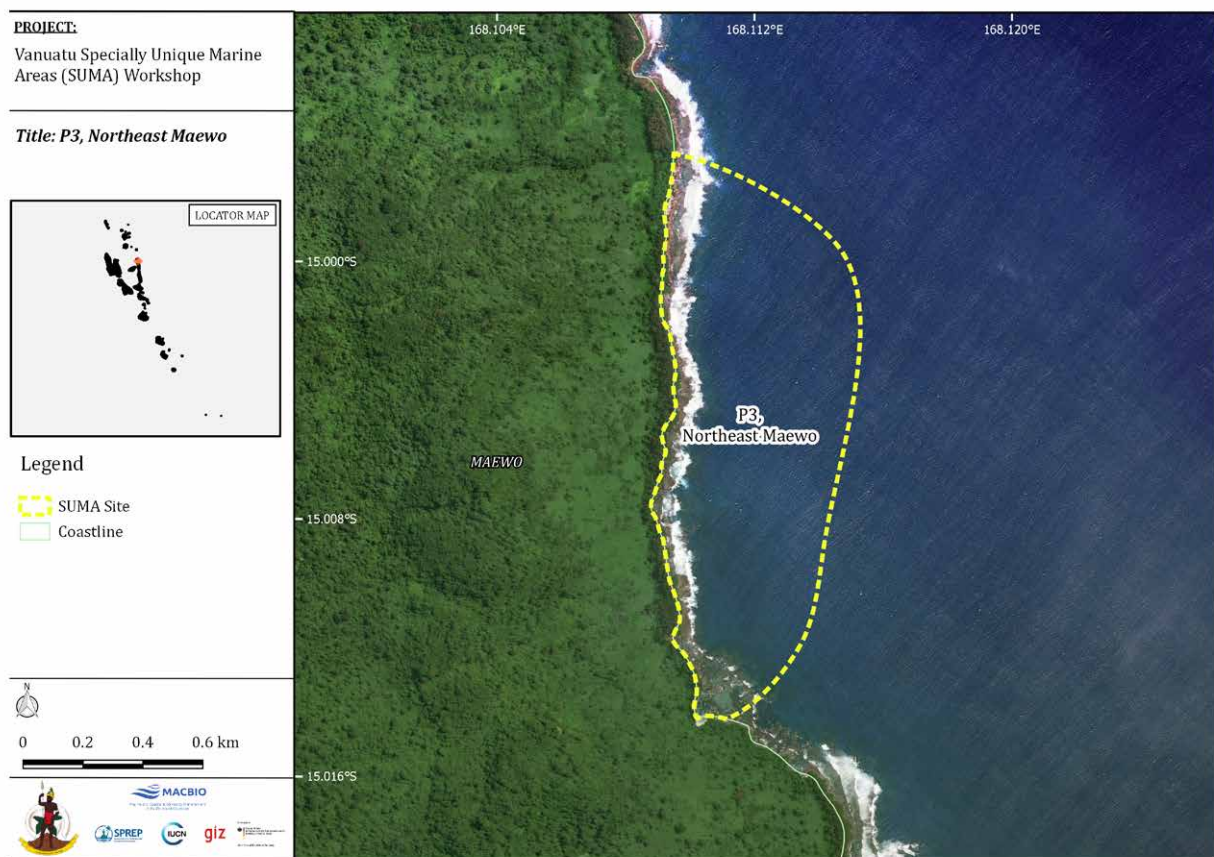


FIGURE 33. SITE P3: Northeast Maewo

TABLE 37. SITE P3: Northeast Maewo. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Penama Province	Northeast Maewo	P3	4

Geographic boundaries

15.0141°S 168.1085°E, 14.9969°S 168.1155°E

Geographic description (score = 2)

This SUMA includes the exposed, narrow reef flat off the east coast of Maewo Island. It extends along approximately 3 km of coastline and 1.5 km out to sea.

Justification (score = 0.5)

This SUMA was identified for its importance to nesting turtles, but no information was available about turtles in this area other than expertise provided by workshop participants. General knowledge about turtles in Vanuatu was reviewed for Site Q1: Quanlap.

Type and number of sources (score = 0.5)

No sources were found to justify this SUMA, other than the expert knowledge of workshop participants and sources reviewed for Site Q1: Quanlap.

Obligations (score = 1)

There are obligations to protect and sustainably manage marine turtles within the Environmental Protection and Conservation Act 2002 and the Fisheries Management Act 2014. Turtles are listed under CITES and on the IUCN Red Environmental Protection and Conservation Act [CAP 283]List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles.

3.2.6 Inshore: Penama Province, Ambae Island

3.2.6.1 SITE P4: WALURIGI

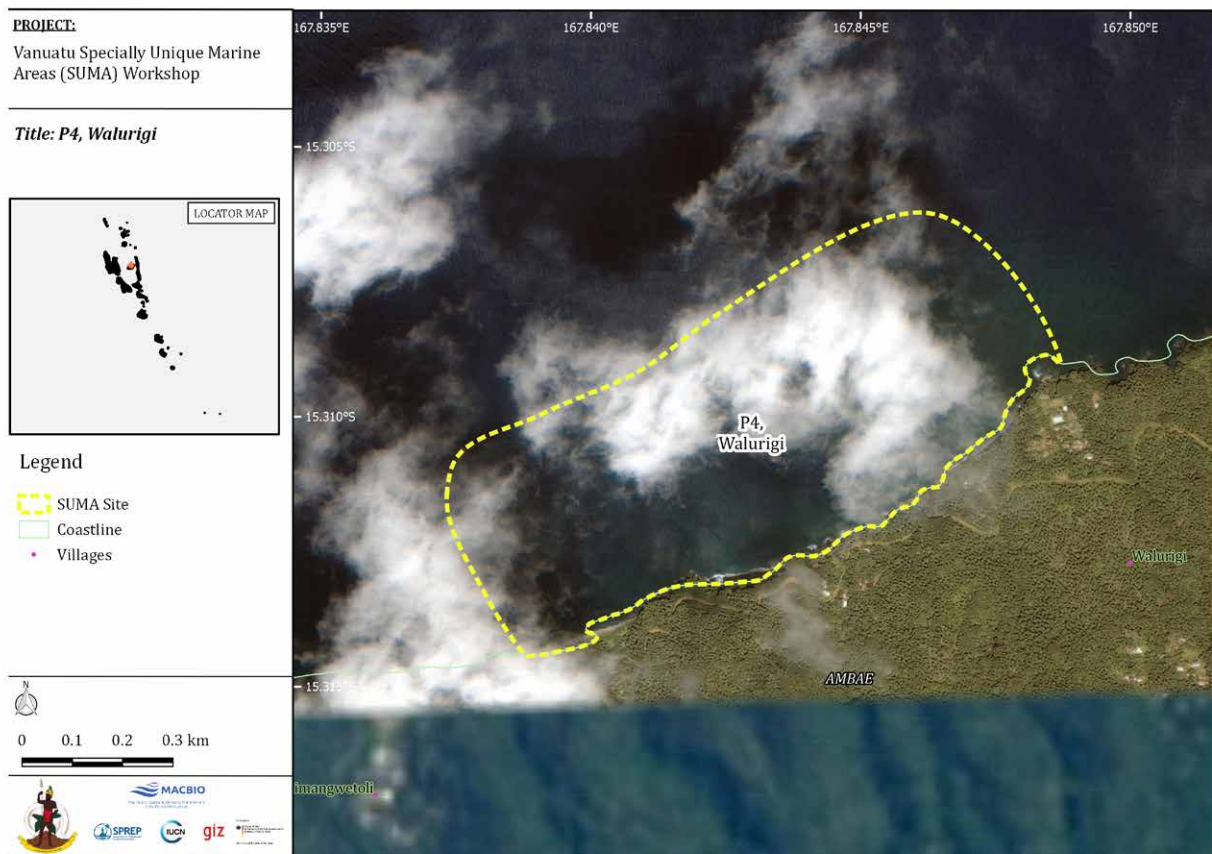


FIGURE 34. SITE P4: Walurigi

TABLE 38. SITE P4: Walurigi. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Penama Province	Walurigi	P4	4.5

Geographic boundaries

15.3111°S 167.8368°E, 15.3098°S 167.8493°E

Geographic description (score = 2)

This SUMA includes the broad, shallow reef flat off the north coast of Ambae Island. It extends along approximately 1.5 km of coastline and 1 km out to sea.

Justification (score = 1)

The wide reef flat supports seagrass beds upon which dugongs feed (Chambers et al. 1989). There was no further information about this SUMA, but seagrass beds and dugongs in Vanuatu are reviewed more generally in Site T4: Linua and Site T8: Reef Islands. The northern part of Ambae Island area has been recognised for its biodiversity and is included as one of the Key Biodiversity Areas of Vanuatu (USP 2012).

Type and number of sources (score = 0.5)

One report contained some information about the SUMA, and it is included in the Key Biodiversity Areas report, albeit without description. Sources used for Site T4: Linua and Site T8: Reef Islands are also relevant here.

Obligations (score = 1)

There are obligations to protect and sustainably manage dugongs within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Dugongs are listed under CITES, and classified as Vulnerable and on the IUCN Red List of Threatened Species.

3.2.6.2 SITE P5: DEVIL'S ROCK



FIGURE 35. SITE P5: Devil's Rock

TABLE 39. SITE P5: Devil’s Rock. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Penama Province	Devil’s Rock	P5	6

Geographic boundaries

15.4485°S 167.6769°E, 15.4609°S 167.6868°E

Geographic description (score = 3)

Devil’s Rock is an outcrop of reef that just out from the southwestern tip of Ambae Island. The SUMA includes the outcrop and adjacent areas of shallow reef and deep water.

Justification (score = 1)

The abrupt topography of Devil’s Rock creates an upwelling of nutrients that attracts aggregations of pelagic fishes that seek out such areas to feed or spawn (Government of Vanuatu 2016). The interaction between hydrodynamics and topography creates patches of high productivity that attracts pelagic species from all trophic levels. The main species of pelagic predators likely to be present in deep coastal waters include dolphinfish (*Coryphaena hippurus*), rainbow runner (*Elegatis bipinnulata*), wahoo (*Acanthocybium solandri*), and barracuda (*Sphyraena* spp.) (Amos 2007). These active predators regulate the food web and influence the distribution and behaviour of their prey. Smaller pelagics which may use habitat like Devil’s Rock include herrings *Spratelloides delicatulus*, *Herklotsichthys punctatus*; anchovies *Stolephorus indicus*, *S. devisi*; silversides *Hypoatherina ovalaua*; cardinalfish *Apogon (Rhabdamia) cypselurus*, *Archamia lineolata*; fusiliers *Pterocaesio pisang*, *P. diagramma*, *Pterocaesio* spp.; lanternfish *Benthoosema fibulatum*; trevallies *Selar crumenphthalmus*, *Decapterus macrosoma*; bigeyes *Priacanthus* spp. and blennies *Xiphasia setifer* (Amos 2007). There are no data on which species tend to frequent Devil’s Rock in particular.

Type and number of sources (score = 1)

The NBSAP provided some information about this SUMA, and one fisheries resource report had information about likely pelagic species that may aggregate in this SUMA.

Obligations (score = 1)

There are obligations to protect and sustainably manage pelagic fish stocks within the Fisheries Management Act 2014. The Devil’s Rock SUMA includes the Devil’s Rock marine conservation site, which is included in the NBSAP (2018–2030) as a proposed marine site as a national priority for formal protection.

3.2.7 Inshore: Penama Province, Pentecost Island

This inshore region consists of Pentecost, Ambae and Maewo Islands (Penama).

3.2.7.1 SITE P6: LOLTONG BAY

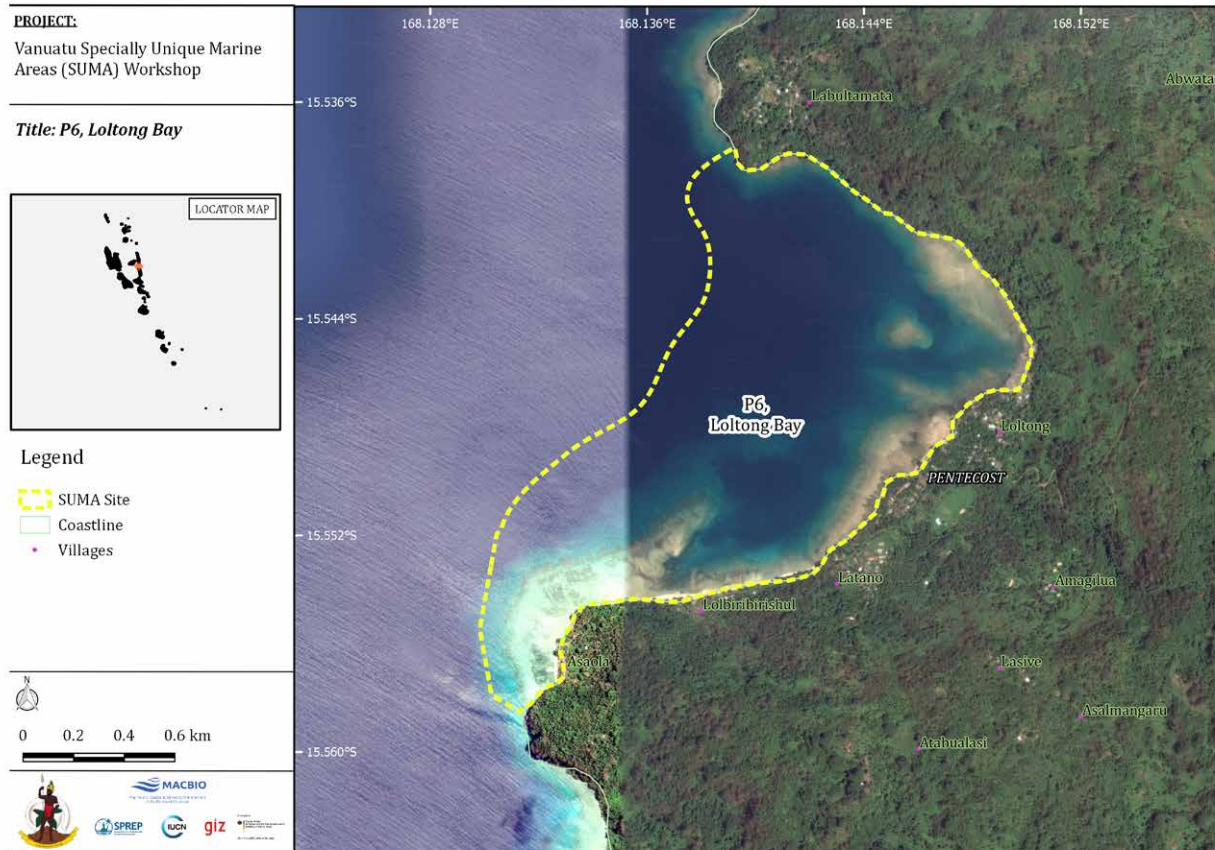


FIGURE 36. SITE P6: Loltong Bay

TABLE 40. SITE P6: Loltong Bay. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Penama Province	Loltong Bay	P6	9

Geographic boundaries

15.5566°S 168.1279°E, 15.5433°S 168.1516°E

Geographic description (score = 3)

Loltong Bay is a sheltered, west-facing embayment on the northwestern coast of Pentecost Island. The coast is lined with mangroves and marine habitats are shallow, with seagrass beds and fringing coral reefs. The SUMA includes the marine habitats throughout the bay.

Justification (score = 2)

Mangrove habitat is rare, not just on Pentecost Island, but throughout the Penama Province (Government of Vanuatu 2016). Loltong Bay also supports dugongs (Chambers et al. 1989; VESS 2017), green and hawksbill turtles (Siota 2015) and a breeding / nursery site for mangrove associated fauna (Government of Vanuatu 2016). Historically, seagrass cover has been high in the bay (between 50 and 75%), but there are no recent estimates (Chambers et al. 1990). It is likely that the bay represents a refuge for seagrasses in the region. There are sheltered coral reefs in the SUMA; anecdotal

evidence suggests that coral cover may be low, but there are healthy populations of giant clams and reef fishes (Done and Navin 1990; S/V Helios 2016b). The north Pentecost area has been recognised for its biodiversity and is included as one of the Key Biodiversity Areas of Vanuatu (USP 2012).

Mangroves, seagrass beds, coral reefs, turtles and dugongs are described for Vanuatu more generally, and for nearby Malekula, in Site T4: Linua, Site Q1: Quanlap, Site T8: Reef Islands and Site M6: Crab Bay.

Type and number of sources (score = 2)

Seven reports, including Vanuatu’s NBSAP, and one website contain some information about the SUMA. Sources used for Site T4: Linua, Site Q1: Quanlap, Site T8: Reef Islands and Site M6: Crab Bay are also relevant here.

Obligations (score = 2)

There are obligations to protect and sustainably manage species associated with coral reefs, seagrass beds and mangroves within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. Dugongs, turtles and a large number of fishes and invertebrates associated with coral reefs, seagrass beds and mangroves are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Lolong Bay SUMA includes Lolong Bay marine conservation site, which is included in the NBSAP (2018–2030) as a proposed marine site as a national priority for formal protection.

3.2.7.2 SITE P7: BAY HOMO

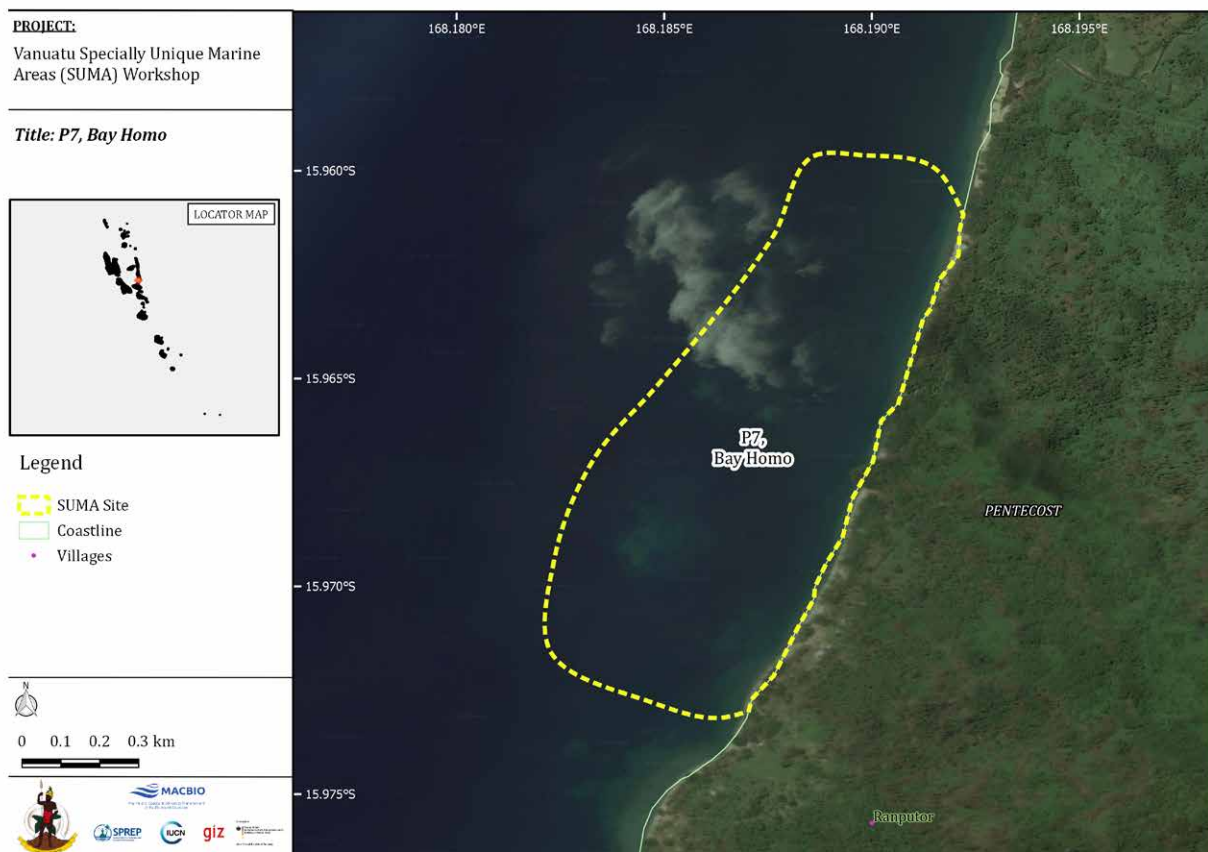


FIGURE 37. SITE P7: Bay Homo

TABLE 41. SITE P7: Bay Homo. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Penama Province	Bay Homo	P7	7.5

Geographic boundaries

15.9713°S 168.1812°E, 15.9607°S 168.1931°E

Geographic description (score = 2)

Bay Homo is a straight stretch of coastline on southwestern Pentecost Island. The SUMA includes roughly 2 km of coastline and inshore marine habitats just under 1 km out to sea, which includes two patch reefs off the edge of the fringing reef.

Justification (score = 1)

Experts present at the workshop noted the presence of dugongs in this SUMA; this was one of only two areas of Pentecost Island with favourable dugong habitat (VESS 2017) and a population of 3–10 dugongs (Chambers et al. 1989). The terrestrial and freshwater values of this area suggest that human impacts on the bay might be light (Kalfatak and Jaensch 2014; Government of Vanuatu 2016). Very little information exists about the seagrass beds and coral reefs in this SUMA, but the efforts to protect terrestrial environments that are underway will benefit these nearshore marine habitats by limiting run-off, sedimentation and pollution (FAO 2018). In the past, coral communities in the SUMA have been recognised as being relatively resistant to disturbance, and quick to recover after storm damage (Done and Navin 1990). Bay Homo has been recognised for its biodiversity and is included as one of the Key Biodiversity Areas of Vanuatu (USP 2012). General information about coral reefs, seagrass beds and dugongs in general, and their distribution in Vanuatu, is reviewed for Site NO3: Vagtande Island, Site T4: Linua and Site T8: Reef Islands.

Type and number of sources (score = 1.5)

Six reports, including Vanuatu's NBSAP (2018–2030), and one website contain some information about the SUMA. Sources used for Site NO3: Vagtande Island, Site T4: Linua and Site T8: Reef Islands are also relevant here.

Obligations (score = 3)

There are obligations to protect and sustainably manage dugongs within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Dugongs are listed under CITES, and classified as Vulnerable and on the IUCN Red List of Threatened Species. There are also obligations to protect and sustainably manage species associated with coral reefs and seagrass beds within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. A large number of fishes and invertebrates associated with coral reefs and seagrass beds are listed under CITES and on the IUCN Red List. The Bay Homo SUMA includes Bay Homo marine conservation site, which is included in the NBSAP (2018–2030) as a proposed marine site as a national priority for formal protection.

3.2.7.3 SITE P8: HOT WOTA

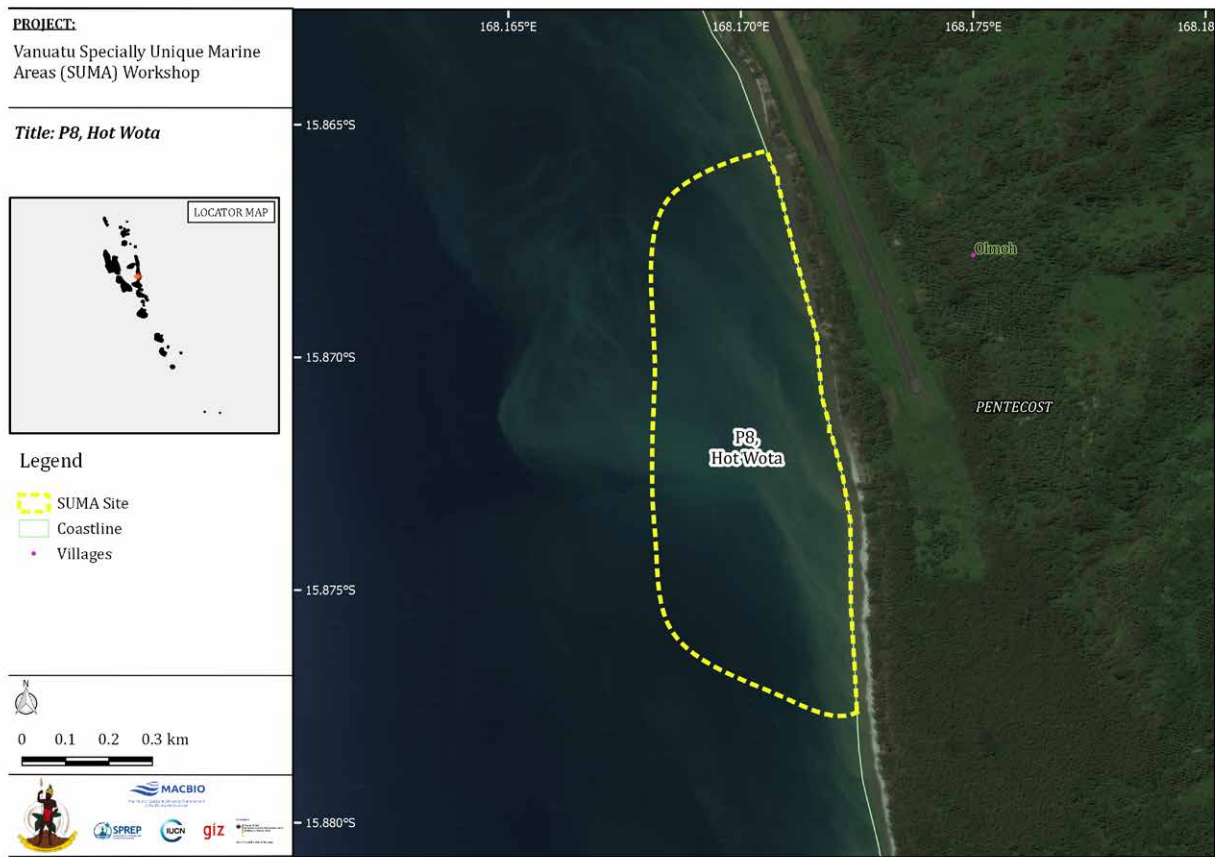


FIGURE 38. SITE P8: Hot Wota

TABLE 42. SITE P8: Hot Wota. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Penama Province	Hot Wota	P8	2.5

Geographic boundaries

15.8655°S 168.1718°E, 15.878°S 168.1684°E

Geographic description (score = 1)

Along the southwestern coast of Pentecost Island, geothermal springs extend from the foreshore into the sea. This SUMA includes just over 1 km of coastline and covers the marine area affected by the springs.

Justification (score = 1)

This SUMA, with its hot springs extending into the sea, has unique geophysical attributes. Hot water is described as “bubbling out of fissures in the ocean floor, forming hot curtains of air and creating unique micro environments” (Vanuatu Cruising 2014b). Water clarity is reportedly high, which can be unusual in coastal marine waters (Vanuatu Cruising 2014b). The effect of the heated water on marine communities in this SUMA is unknown.

Type and number of sources (score = 0.5)

One website offered some information about this SUMA. Given the unique geophysical nature of this area, it is unlikely that sources used to describe other shallow marine SUMAs will apply here.

Obligations (score = 0)

Marine communities present in this SUMA are uncertain, as are the obligations to protect them.

3.2.8 Inshore: Malampa Province, Malekula Island

This inshore region consists of Malekula, Ambrym, Pamma and Lopevi Islands (Malampa).

3.2.8.1 SITE M1: VULAI ISLAND

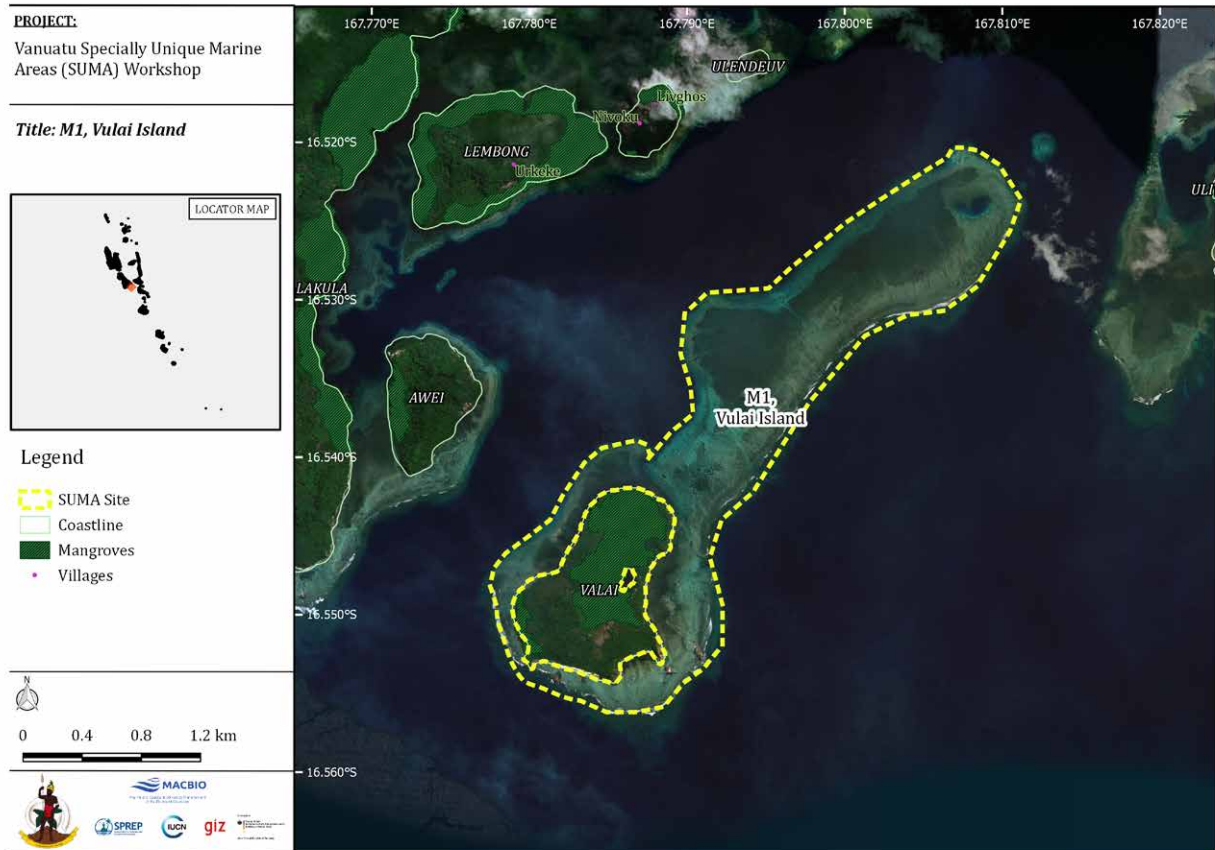


FIGURE 39. SITE M1: Vulai Island

TABLE 43. SITE M1: Vulai Island. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Malampa Province	Vulai Island	M1	9

Geographic boundaries

16.5507°S 167.775°E, 16.524°S 167.8132°E

Geographic description (score = 3)

Malekula Island is the second largest island in Vanuatu, with a land area of 2,069 km². Vulai Island is one of the Maskelynes Islands, a group of low-lying islands with extensive mangrove and coral reef habitats, located at the southeastern end of Malekula Island. Vulai Island measures approximately 1.5 km by 700 m. The SUMA includes the coastal habitats immediately surrounding the island, and the barrier reef (Sughulamp Reef) tailing off to the northeast from Vulai Island towards Malekula Island.

Justification (score = 2)

This SUMA was chosen for its importance as turtle nesting and foraging habitat, and as a productive area for fish. Overall, around 200 green and hawksbill turtles are thought to nest throughout Malekula Island each year (Maison et al. 2010). Foraging green and hawksbill turtles have been recorded off Vulai Island (Siota 2015), and are known to nest in

the Maskelyne Islands area (Amos 2007). Malekula Island is also known to host nesting leatherback turtles (Petro et al. 2007), but it is unknown whether they nest on Vulai Island as well. The Maskelyne Islands are known as one of the key areas for the fishing of turtles (Amos 2007), which indicates both their local abundance. Further information about turtles in Vanuatu can be found at Site Q1: Quanlap.

Marine habitats around Vulai Island include sheltered coastal reef and outer reef environments (Friedman et al. 2008); the reefs around the Maskelyne Islands in general are considered to be subject to a low proportion of stressors (Chin et al. 2011) by virtue of their remoteness and existing traditional management (Friedman et al. 2008). Sughulamp Reef hosts different coral reef communities from most other reefs in the area, because of its different structure as a barrier reef, rather than a fringing reef (Planetary Coral Reef Foundation 2004). Vulai Island is one of very few areas in Vanuatu where the endangered golden sandfish, *Holothuria lessoni*, can be found; shallow reefs around the island offer favourable recruitment habitat for this species (Pakoa et al. 2013). In fact, Vulai Island has been proposed as a conservation area specifically for invertebrates (Pakoa et al. 2013; Government of Vanuatu 2016).

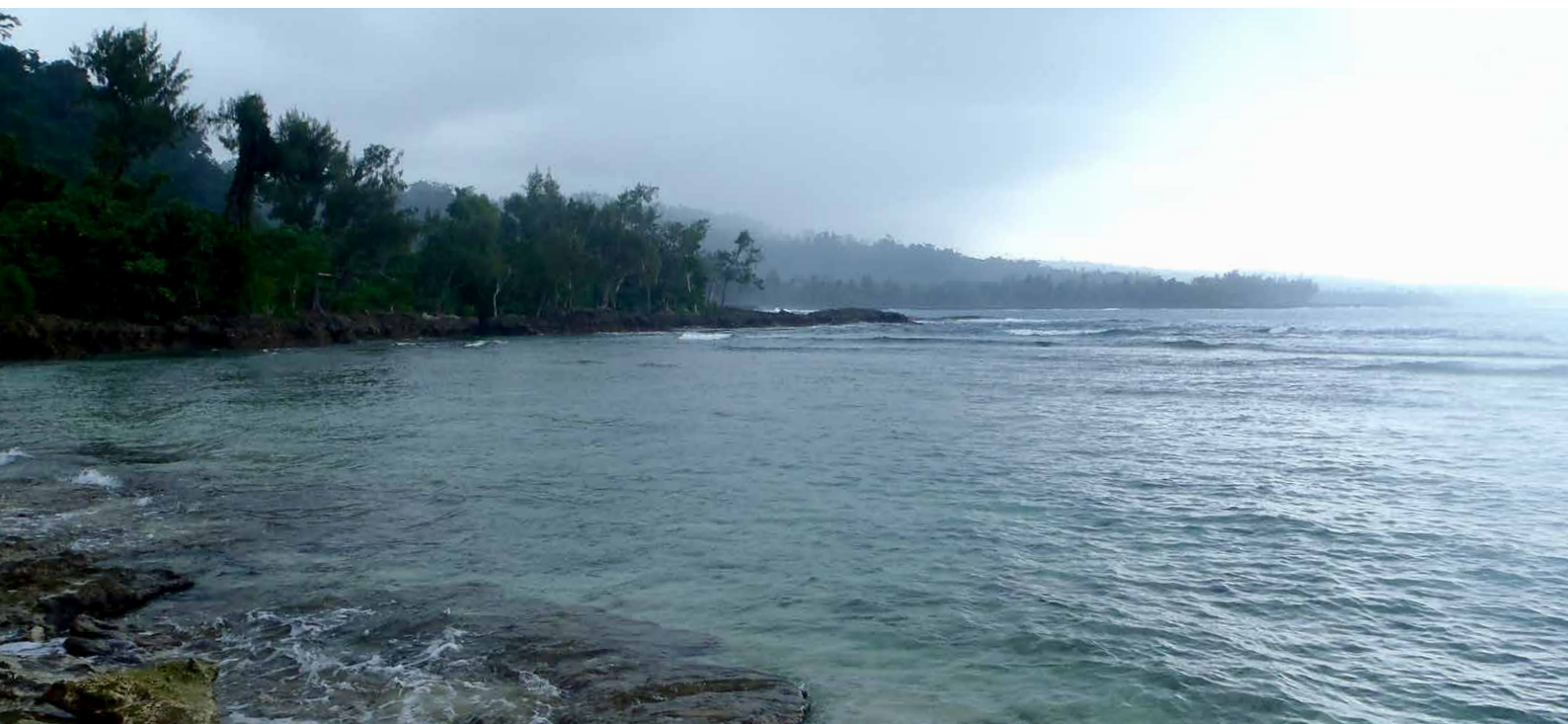
The Maskelyne Islands and Malekula Island make up part of the North Vanuatu-Santa Cruz Islandscape, because of their joint importance, with the rest of the area, for sustaining seabird populations, and for enhancing the resilience of the broader marine ecosystems to climate change by preserving a latitudinal continuum of corals (USP 2012).

Type and number of sources (score = 2)

Four reports and one website were used as sources of information about the site itself, and two reports described aspects of the broader Maskelyne Archipelago. One peer-reviewed paper and one report contained information about turtles in the Malekula Island area, and one report indicated the broader regional importance of the area. Sources used to describe the attributes of Site Q1: Quanlap are also relevant here.

Obligations (score = 2)

There are obligations to protect and sustainably manage species associated with coral reefs within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. *Holothuria lessoni*, the golden sandfish, is listed as Endangered on the IUCN Red List of Threatened Species. The traditional structure of customary marine tenure is strong in the Maskelyne Archipelago. Turtles are listed under CITES and on the IUCN Red List of Threatened Species (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Vulai Island SUMA includes the Vulai Island marine tabu site, which is included in the NBSAP (2018–2030) as an existing marine conservation site.



3.2.8.2 SITE M2: RINGI TE SUH GIANT CLAMS

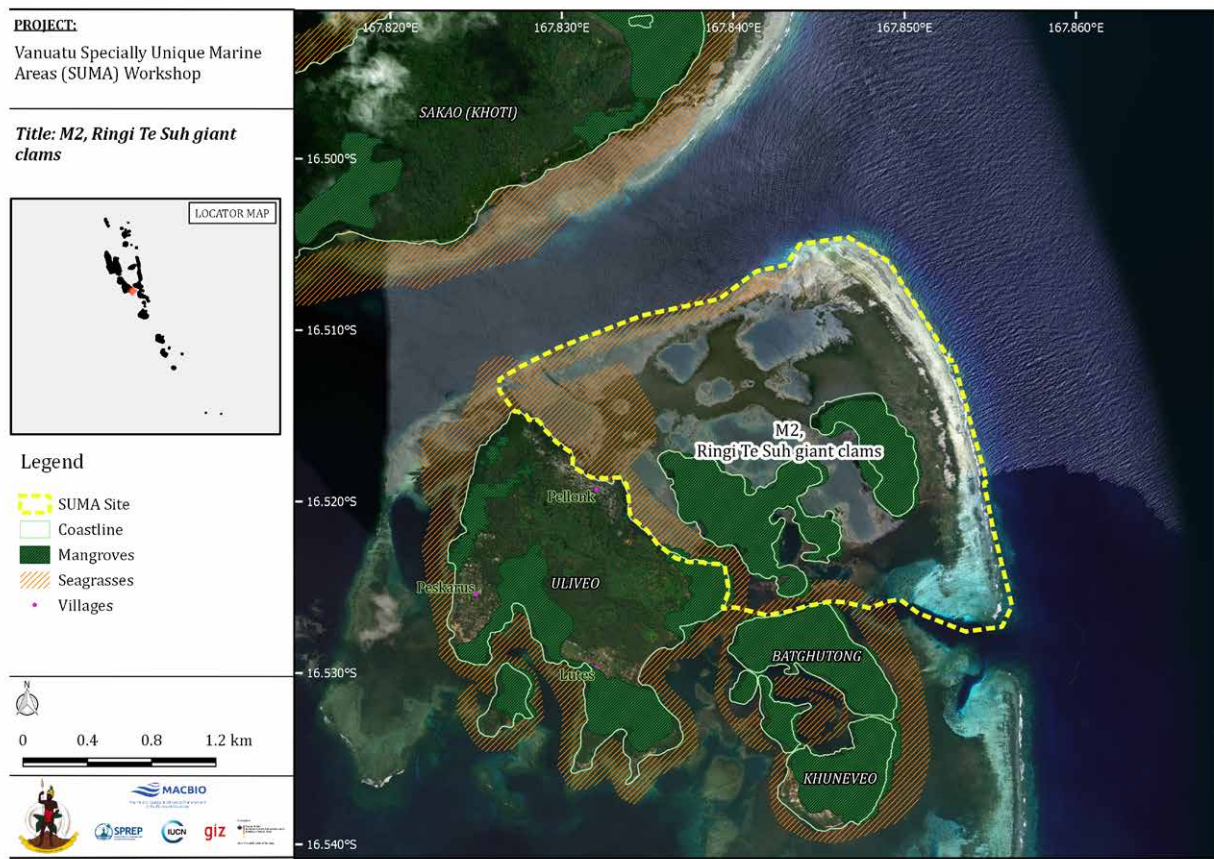


FIGURE 40. SITE M2: Ringi Te Suh giant clams

TABLE 44. SITE M2: Ringi Te Suh giant clams. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Malampa Province	Ringi Te Suh giant clams	M2	7

Geographic boundaries

16.5028°S 167.849°E, 16.5358°S 167.8359°E

Geographic description (score = 2)

Metai Island is one of the Maskelyne Islands, a group of low-lying islands with extensive mangrove and coral reef habitats, located at the southeastern end of Malekula Island. The island measures approximately 750 by 300 m, and the SUMA includes a narrow band of the shallow reef flat and reef habitats immediately surrounding the island, where a giant clam sanctuary has been established.

Justification (score = 2)

Five species of tridacnid clams have been recorded in Vanuatu, including *Tridacna maxima*, *T. squamosa*, *T. crocea*, *T. derasa* and *Hippopus hippopus*. The giant clam *T. gigas* is thought to be locally extinct. A 1988 survey showed that *T. maxima* is the most common species in Vanuatu, followed by *H. hippopus*, which is absent in populated areas. The other species are reported more rarely (Amos 2007).

The Clam Sanctuary of Ringi Te Suh (“Let Alone” or “Let Multiply” in the Maskelyne language) was established in 1991 as a community initiative to preserve marine life for future generations (Pakoa et al. 2013; Vanuatu Cruising 2014c). The core of the sanctuary is a marked area of about 1 km², which was restocked with *Hippopus hippopus* and *Tridacna squamosa*. The sanctuary was successful, and clam populations doubled to 1,100 clams in 1998 (Friedman et al.

2011). The protection, which automatically includes all coral reef species within its boundaries, has been of benefit to the entire coral reef environment, which is said to host abundant corals and fishes (Vanuatu Cruising 2014c). Ringi Te Suh has been recognised for its biodiversity and is included as one of the Key Biodiversity Areas of Vanuatu (USP 2012). Tridacnid clams have been depleted throughout their Vanuatu (Amos 2007), making sanctuaries such as this one important repositories for remaining populations, and sources of larvae to depleted reefs (Johannes and Hickey 2004).

Type and number of sources (score = 2)

One website and four reports contained information about this SUMA. Additionally, one fisheries report highlighted knowledge about tridacnid clams in Vanuatu more generally.

Obligations (score = 1)

There are obligations to protect and sustainably manage tridacnid clams within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Both clam species present in the sanctuary, *Hippopus hippopus* and *Tridacna squamosa*, are listed as “Lower risk / conservation dependent” on the IUCN Red List of Threatened Species. The traditional structure of customary marine tenure is strong in the Maskelyne Archipelago. The Ringi Te Suh SUMA includes Ringi Te Suh marine tabu/conservation site, which is included in the NBSAP (2018–2030) as a proposed marine site as a national priority for formal protection.

3.2.8.3 SITE M3: GASPARD BAY DUGONG GARDEN

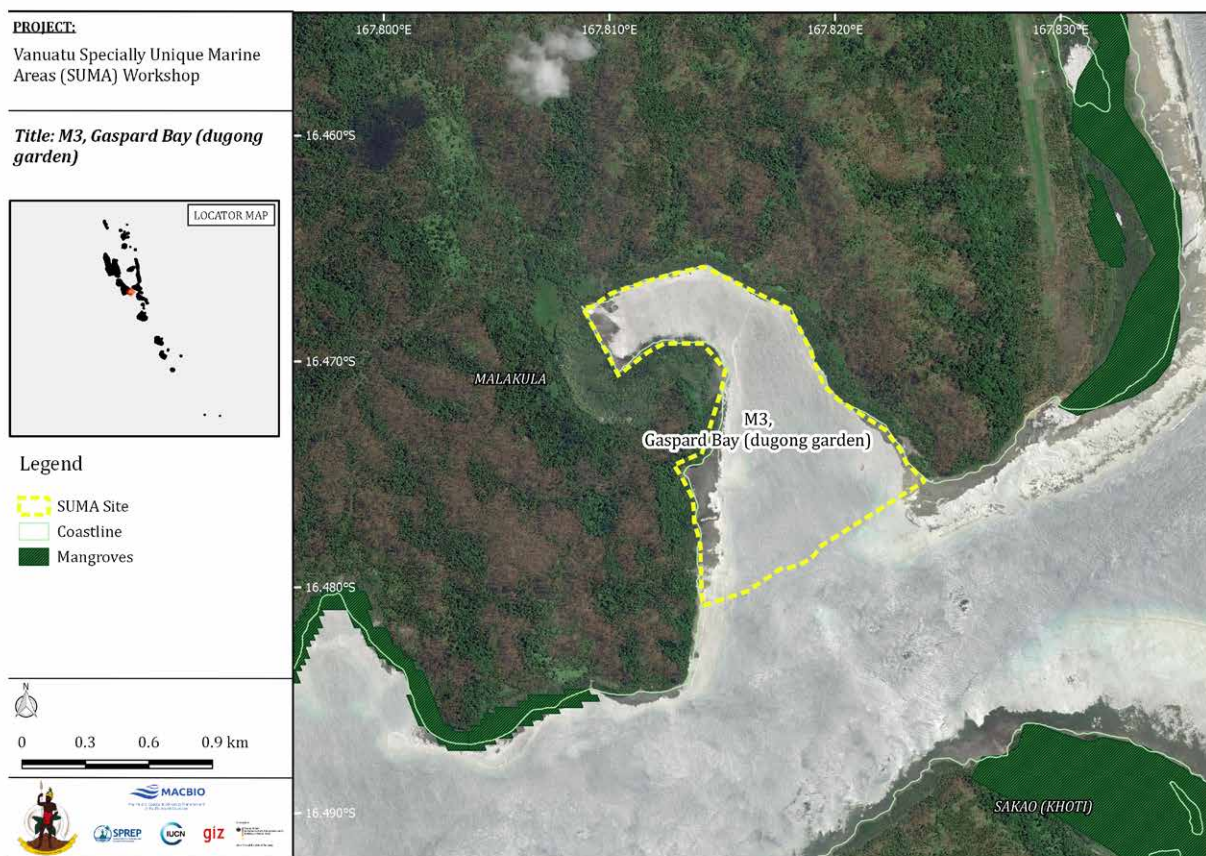


FIGURE 41. SITE M3: Gaspard Bay dugong garden

TABLE 45. SITE M3: Gaspard Bay dugong garden. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Malampa Province	Gaspard Bay dugong garden	M3	10

Geographic boundaries

16.4633°S 167.8192°E, 16.481°S 167.8142°E

Geographic description (score = 2)

Gaspard Bay is located at the southeastern end of Malekula Island. The waters of the bay separate Malekula from Sakao Island. The SUMA encompasses the shallow waters of the bay, including a wide reef flat and the waters just beyond the reef edge.

Justification (score = 3)

This SUMA was identified as being rich in mangroves and seagrasses, and important for dugongs and turtles.

Malekula Island has the largest area of mangroves (1,915 ha) in Vanuatu (Kalfatak and Jaensch 2014). There are three main areas of mangrove: Port Sandwich (175 ha), the coast south of Lamap (262 ha) and the Maskelyne Islands (420 ha). Mangroves in the Maskelyne Islands are extensive and highly productive, yielding at least 66 species of fish and valued invertebrates such as mangrove crabs (Amos 2007). Of the fish fauna, 32 families are regularly caught in the mangrove areas, and 29 of these are found exclusively within the mangroves. Common species include mullets (Mugilidae), rabbitfish (Siganidae) and goatfish (Mullidae) (Kalfatak and Jaensch 2014).

The intertidal zones around the Maskelyne Islands host some of the largest seagrass beds in Vanuatu (Kalfatak and Jaensch 2014). Seagrass beds around the Maskelyne Islands and southeast Malekula grow in mosaic patterns due to the pronounced hummock-hollow configuration of the beach caused by burrowing animals (Chambers et al. 1990). The dark green *Thalassia hemprichii* tends to dominate on the hummocks, while the lighter green *Cymodocea rotundata* and *Enhalus acoroides* are dominant in the hollows. Large amounts of algae, especially dense growths of green filamentous algae and *Caulerpa* spp., are mixed with the seagrasses in the intertidal areas of the Maskelynes and southeast Malekula. Such areas have very high biomass and primary productivity.

Gaspard Bay is well-known for its relatively large populations of dugongs (VESS 2017), which indicates that the seagrass beds, upon which they rely, remain healthy (Chambers et al. 1989; Kalfatak and Jaensch 2014; Malampa Travel 2017). Green and hawksbill turtles have been recorded foraging off Sakao Island (Siota 2015). More information about turtles and dugongs in Vanuatu is presented at Site Q1: Quanlap and Site T8: Reef Islands.

The seagrass beds in Gaspard Bay also support several tridacnid clam and sea cucumber species, including *Holothuria atra*, *H. edulis*, *H. scabra* and *Stichopus chloronotus*. The sandfish *H. scabra* has been overexploited worldwide, making remnant populations of this species more valuable (Amos 2007).

Type and number of sources (score = 2)

Five reports and one website, which contains a video about dugongs at the site, provided information directly about attributes of this SUMA. A peer-reviewed article supplied information about the Maskelyne Island area in general. Sources used to describe the attributes of Site Q1: Quanlap and Site T8: Reef Islands are also relevant here.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with seagrass beds and mangroves within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. The traditional structure of customary marine tenure is strong in the Maskelyne Archipelago. Turtles, dugongs and a large number of fishes and invertebrates associated with seagrass beds and mangroves are listed under CITES and on the IUCN Red List (sandfish are Endangered, green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles and dugongs are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles.

3.2.8.4 SITE M4: ARAB BRIDGE



FIGURE 42. SITE M4: Arab Bridge

TABLE 46. SITE M4: Arab Bridge. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Malampa Province	Arab Bridge	M4	6

Geographic boundaries

16.4595°S 167.7833°E, 16.4863°S 167.7694°E

Geographic description (score = 2)

This SUMA is the last 2 km of a mangrove-lined inlet on southeastern Malekula Island. Lamap, Port Sandwich and Barias are prominent towns east of the SUMA.

Justification (score = 1)

Expert workshop participants identified this area as being important for mangroves, seagrass, mud crabs and fishes. The inlet, sometimes also referred to as Port Sandwich Bay, has some of the richest mangrove stands in Vanuatu (Kalfatak and Jaensch 2014). Seagrasses are not specifically described for this SUMA, but are expected to be similar to those in Site M3: Gaspard Bay dugong garden. Mangroves in the general area are highly productive, yielding at least 66 species of fish and valued invertebrates such as mangrove crabs (Amos 2007). Of the fish fauna, 32 families are regularly caught in the mangrove areas, and 29 of these are found exclusively within the mangroves. Common species include mullets (Mugilidae), rabbitfish (Siganidae) and goatfish (Mullidae); and there are abundant populations of the crabs *Cardiosoma hirtipes* and the mud crab *Scylla serrata* (Kalfatak and Jaensch 2014).

Type and number of sources (score = 1)

One report provided information directly about the attributes of the SUMA, and one report added knowledge about the general area. Sources used for Site M3: Gaspard Bay dugong garden are also relevant here.

Obligations (score = 2)

There are obligations to protect and sustainably manage species associated with mangroves and seagrass beds within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. A large number of fishes and invertebrates associated with mangroves and seagrass beds are listed under CITES and on the IUCN Red List.

3.2.8.5 SITE M5: BAMBOO BAY AND DICKSON REEF

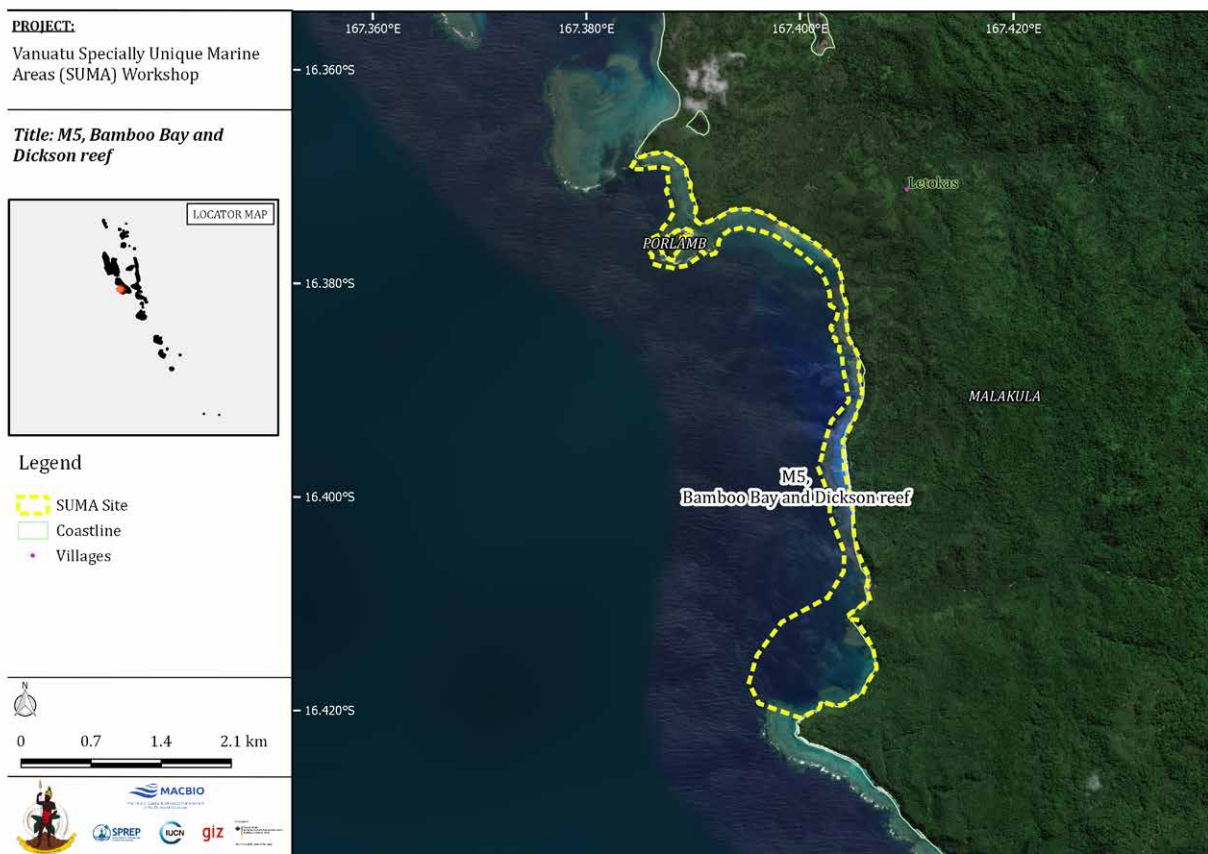


FIGURE 43. SITE M5: Bamboo Bay and Dickson Reef

TABLE 47. SITE M5: Bamboo Bay and Dickson Reef. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Malampa Province	Bamboo Bay and Dickson Reef	M5	8

Geographic boundaries

16.3644°S 167.4003°E, 16.4217°S 167.3962°E

Geographic description (score = 2)

This SUMA includes a small island on the western side of Malekula Island, which is surrounded by an extensive reef flat. The island measures 120 by 300 m, and the SUMA extends from the high-water mark to marine areas beyond the reef flat.

Justification (score = 2)

This SUMA was identified for its coral reef and seagrass habitat, and for its importance to hawksbill turtles; Bamboo Bay is already highlighted as a conservation area (Government of Vanuatu 2016). Direct information on coral reefs in Malekula is scarce; island-wide coral cover excluding the Maskelyne Islands (see above) was estimated at ~37% in 2007 (Raubani 2009). This area part of Malekula Island has been recognised for its biodiversity and is included as one of the Key Biodiversity Areas of Vanuatu (USP 2012).

Further south, surveys conducted in Southwest Bay have shown high reef fish densities in response to community-managed protected areas (Coward et al. 2014). There were high densities herbivorous taxa, which increases the resilience of the reefs in the face of climate change (Cheal et al. 2010a; Holbrook et al. 2016b); the high herbivore densities also correspond with low cover of nutrient indicator algae at all sites. Predatory fish density was low, probably due to subsistence fishing that preferentially targets predators. Structural complexity of habitat was low in Southwest Bay, but it is uncertain whether this would be the case in this SUMA. For further information about coral reefs in Vanuatu, see Site NO3: Vagtande Island.

Hawksbill and green turtles are regularly recorded foraging around Bamboo Bay Village, and between 2007 and 2015, a dozen individuals of each species, on average, have been observed nesting here each year (Siota 2015). Hawksbill turtles have also been known to migrate between Vanuatu and Australia, including one individual tagged at Bamboo Bay Village (The Daily Examiner 2010), suggesting that this may be a beach of regional importance (Maison et al. 2010).

Type and number of sources (score = 2)

Four reports and one website provided information directly about the site. Two reports were consulted for information about coral reefs and seagrasses in Malekula in general, and two general peer-reviewed articles provided information about the importance of herbivory. Sources used to describe the attributes of Site NO3: Vagtande Island and Site T4: Linua are also relevant here.

Obligations (score = 2)

There are obligations to protect and sustainably manage species associated with coral reefs and seagrass beds within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Turtles are listed under CITES and on the IUCN Red List of Threatened Species (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Bamboo Bay and Dickson Reef SUMA includes the Dickson Reef marine tabu/conservation site, which is included in the NBSAP (2018–2030) as a proposed marine site as a national priority for formal protection.



3.2.8.6 SITE M6: CRAB BAY

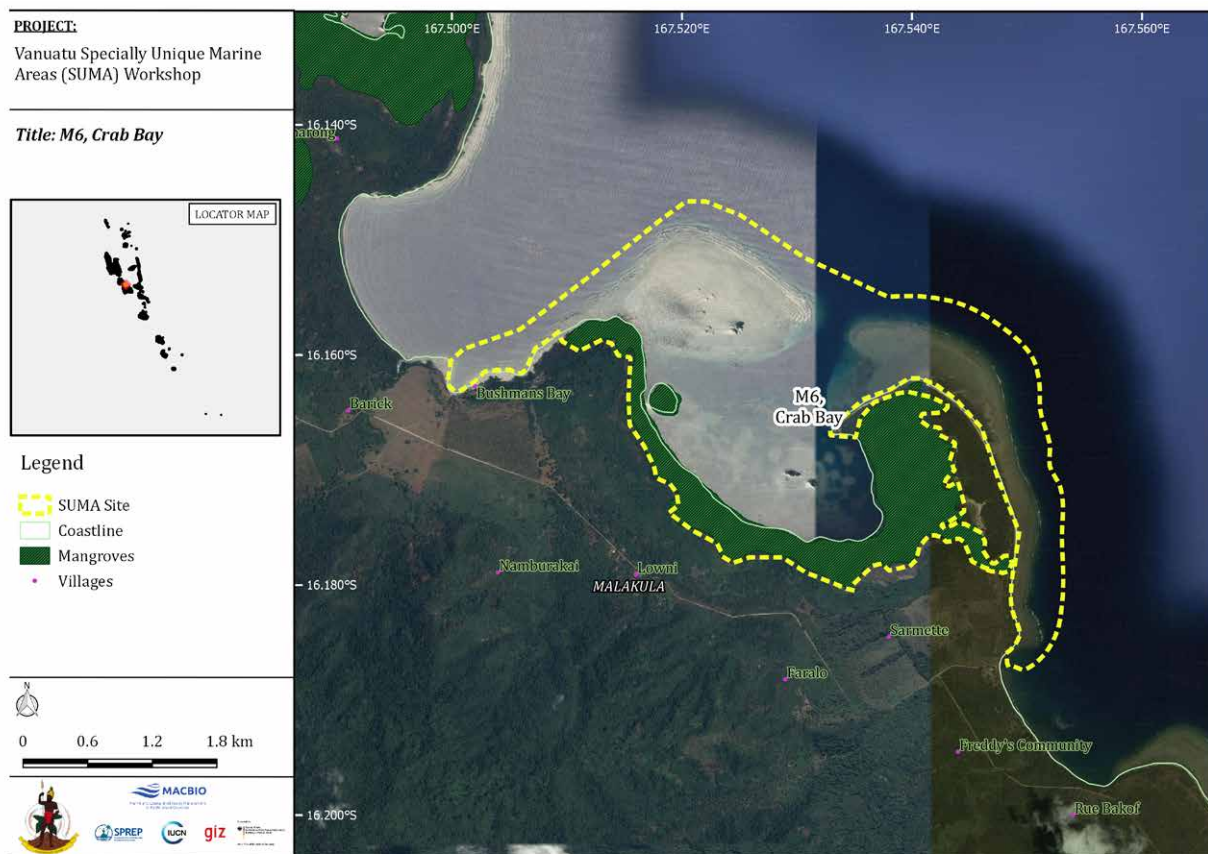


FIGURE 44. SITE M6: Crab Bay

TABLE 48. SITE M6: Crab Bay. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Malampa Province	Crab Bay	M6	12

Geographic boundaries

16.1409°S 167.5078°E, 16.1887°S 167.5508°E

Geographic description (score = 3)

Crab Bay is located in the central part of eastern Malekula Island, and consists of a large, mangrove-lined embayment protected to the east by a headland. The SUMA consists of the coastal and coral reef habitats in the bay and around this headland.

Justification (score = 3)

Crab Bay is an existing conservation area (Government of Vanuatu 2016) due to its relatively intact habitats, the fact that mangroves, seagrass beds and coral reefs lie in close proximity to one another, and because it provides habitat for protected species (turtles, dugongs) and invertebrates that have been depleted elsewhere (trochus, land crabs). Crab Bay has been subject to biophysical and socioeconomic studies, making it one of the best understood areas in Vanuatu; the general area along this coastline contains the second largest stand of mangroves in Vanuatu (Kalfatak and Jaensch 2014). Crab Bay has been recognised for its biodiversity and is included as one of the Key Biodiversity Areas of Vanuatu (USP 2012).

Areas around Crab Bay and Amal have been extensively mapped, making it possible to understand the spatial relationship of the different habitats present (Baereleo et al. 2013). Over the entire Amal/Crab Bay area, there are 250 ha of mangroves (Kalfatak and Jaensch 2014), which are considered in good or very good health; they line an estimated

88.2% of the shoreline, with moderate to high biomass (86%), especially further from populated areas (Baereleo et al. 2013). The forest is thought to be expanding; this is extremely rare during a time when most mangrove forests face reduction from a variety of impacts. Crab Bay itself had approximately 113 ha of mangrove cover, including 11 mangrove species and 5 major vegetation types. The dominant species near the shoreline is *Rhizophora stylosa* (96%), followed by *R. apiculata*. Six species of mangrove associates were recorded; these provide habitat for many species of finfish that were found on the reefs, both sheltered and exposed (Hickey 2007). Terrestrial surveys revealed abundant birds, invertebrates and reptiles, showing how mangroves can provide both a filter and a connectivity pathway between marine and terrestrial ecosystems (Baereleo et al. 2013).

The sheltered waters within the bay act as a highly productive lagoon habitat, with soft corals, hard corals and seagrasses typical of muddy coastal environments (Done and Navin 1990), while the outer reef flat have a more diverse coral community with ~20% cover of hard corals (Dumas and Jayven 2015). The fish community varies by reef type, but the larger taxa are dominated by mullet (Mullids), rabbitfish (Siganids), scads (Carangids), mackerel (*Rastrelliger* spp. and Scombrids) and sardines (*Sardinella* spp.). The bay is surrounded by two large fringing reefs with steep drop-offs (Hickey 2006), and their coral assemblages are dominated by submassive, digitate and encrusting corals (Dumas and Jayven 2015). Further information about the value of these habitats in close proximity is available at Site S1: Palekula to Turtle Bay.

Ecological surveys of Crab Bay focussed upon coastal land crabs (*Cardisoma carnifex* and *C. hirtipes*), but also included other species (Hickey 2007). Burrow density indicated a high density of these crabs, suggesting successful protection. Trochus densities were high following a restocking program, which also led to increased recruitment. Approximately 50 species of shellfish were recorded within the various habitats, along with over 30 species of avifauna (Table 49).

TABLE 49. Key species recorded in Crab Bay during ecological surveys. From Hickey (2007)

Taxa	Family	Species	Common name
Mangroves	Rhizophoraceae	<i>Rhizophora stylosa</i>	
		<i>R. mucronata</i>	
		<i>R. apiculata</i>	
		<i>Ceriops tagal</i>	
	Sonneratiaceae	<i>Sonneratia caseolaris/alba</i>	
	Verbanaceae	<i>Avicennia marina</i>	
	Euphorbiaceae	<i>Excoecaria agallocha</i>	
	Sterculiaceae	<i>Heritiera littoralis</i>	
	Meliaceae	<i>Xylocarpus granatum</i>	
	Naelaslas	<i>X. molucensis</i>	
	Pteridaceae	<i>Acrostichum aureum</i>	
Leguminosae	<i>Derris trifoliata</i>		
Birds	Ardeidae	<i>Egretta sacra</i>	Eastern reef egret
		<i>Butorides striatus</i>	Striated heron
	Acanthizidae	<i>Gerygone flavolateralis</i>	Fan-tailed Gerygone
	Accipitridae	<i>Circus aeruginosus</i>	Swamp harrier
	Alcedinidae	<i>Todiramphus chloris</i>	Collared kingfisher
	Artamidae	<i>Artamus leucorhynchus</i>	White-breasted woodswallow
	Campephagidae	<i>Lalage leucopyga</i>	Long-tailed triller
		<i>Coracina caledonica</i>	South Melanesian cockooshrike
	Charadriidae	<i>Pluvialis dominica</i>	Pacific golden plover
	Columbidae	<i>Ptilinopus greyii</i>	Red bellied fruit dove
		<i>Chalcophaps indica</i>	Grey-capped emerald dove
	Hirundinidae	<i>Hirundo tahitica</i>	Tahiti swallow
	Laridae	<i>Thalasseus bergii</i>	Greater crested tern
	Meliphagidae	<i>Gliciphila notabilis</i>	Vanuatu flycatcher
		<i>Lichmera incana</i>	Grey-eared honeyeater
	Monarchidae	<i>Myiagra caledonica</i>	Melanesian flycatcher
Rallidae	<i>Hypotaenidia philippensis</i>	Buff-banded rail	
Rhipiduridae	<i>Rhipidura spilodera</i>	Vanuatu streaked fantail	

Taxa	Family	Species	Common name
Birds	Scolopacidae	<i>Numenius phaeopus</i>	Whimbrel
		<i>Tringa incana</i>	Wandering tattler
	Zosteropidae	<i>Zosterops lateralis</i>	Silvereye
Finfish	Acanthuridae	<i>Acanthurus lineatus</i>	Blue-lined surgeonfish
		<i>A. triostegus</i>	Convict tang
		<i>A. xanopterus</i>	Yellowfin surgeonfish
		<i>Naso spp.</i>	Unicornfish
	Apogonidae	<i>Sphaeramia orbicularis</i>	Orbiculate cardinalfish
	Balistidae	<i>Balistoides viridescens</i>	Titan triggerfish
		<i>Rhinecanthus spp.</i>	Triggerfish
	Caesionidae	<i>Caesio spp.</i>	Fusilier
	Carangidae	<i>Caranx melampygus</i>	Bluefin trevally
		<i>Caranx sexfasciatus</i>	Bigeye trevally
	Chaetodontidae	<i>Chaetodon spp.</i>	Butterflyfish
	Clupeiformes	<i>Spratelloides spp.</i>	Herring
	Dasyatidae	<i>Taeniura meyeri</i>	Black-blotched stingray
	Gerreidae	<i>Gerres oyena</i>	Common silver-biddy
		<i>G. acinaces</i>	Longtail silver-biddy
	Haemulidae	<i>Plectorhinchus chaetodontoides</i>	Harlequin sweetlips
		<i>P. lineatus</i>	Yellowbanded sweetlips
	Holocentridae	<i>Sargocentron spp.</i>	Squirrelfish
	Kyphosidae	<i>Kyphosus spp.</i>	Chub
	Labridae	<i>Cheilinus undulatus</i>	Humpheaded Maori wrasse
		<i>Choerodon anchorago</i>	Orange-dotted tuskfish
		<i>Epibulus insidiator</i>	Slingjaw wrasse
		<i>Gomphosus varius</i>	Bird wrasse
	Lethrinidae	<i>Lethrinus harak</i>	Thumbprint emperor
		<i>Monotaxis grandoculis</i>	Humpnose big-eye bream
	Lutjanidae	<i>Lutjanus argentimaculatus</i>	Mangrove jack
		<i>L. bohar</i>	Red snapper
		<i>L. fulvus</i>	Blacktail snapper
		<i>L. ehrenbergi</i>	Blackspot snapper
		<i>L. gibbus</i>	Humpback red snapper
		<i>L. semicinctus</i>	Black-banded snapper
		<i>L. monostigma</i>	One-spot snapper
	Mugillidae	<i>Macolor niger</i>	Black and white snapper
		<i>Crenimugil crenilabis</i>	Fringelip mullet
		<i>Ellochelon vagiensis</i>	Squaretail mullet
	Mullidae	<i>Mulloidichthys vanicolensis</i>	Yellowfin goatfish
		<i>Parupeneus spp.</i>	Goatfish
	Muraenidae	<i>Gymnothorax polyurandon</i>	Freshwater moray
	Nemipteridae	<i>Scolopsis lineatus</i>	Striped monocle bream
	Plotosidae	<i>Plotosus lineatus</i>	Striped eel catfish
	Pomacentridae	<i>Abudefduf septemfasciatus</i>	Banded sergeant
		<i>Abudefduf spp.</i>	Sergeant-major
	Scaridae	<i>Scarus spp.</i>	Parrotfish
	Serranidae	<i>Epinephelus maculatus</i>	Highfin grouper
		<i>Epinephelus spp.</i>	Grouper
		<i>Plectropomus leopardus</i>	Common coral trout
	Siganidae	<i>Siganus spp.</i>	Rabbitfish
	Sphyraenidae	<i>Sphyraena sp.</i>	Barracuda
	Teraponidae	<i>Terapon jarbua</i>	Crescent grunter

An early seagrass survey in Crab Bay recorded only *Thalassia hemprichii* (Chambers et al. 1990). However, more recent assessments also recorded at least *Enhalus acoroides* and *Halophila* spp., covering, altogether, an average of ~10% and partitioned according to habitat characteristics (Hickey 2007).

At least six to ten dugongs have historically been recorded in Crab Bay (Chambers et al. 1989; VESS 2017). There are records of nesting or foraging green and hawksbill turtles, and potentially leatherback turtles further north (Hickey 2007).

Type and number of sources (score = 3)

Ten reports contained information about this SUMA. Another report gave details about a similar area further north, and was also consulted. Sources used to describe the attributes of Site NO3: Vagtande Island, Site T4: Linua, Site Q1: Quanlap and Site S1: Palekula to Turtle Bay, especially dugongs, turtles and the primary marine habitats occurring in the SUMA, are also relevant here.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with coral reefs, seagrass beds and mangroves within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. Customary Marine Tenure has been implemented successfully in this area including through the Amal-Crab Bay Ecological Reserve. Trochus is subject to size and quota restrictions. Turtles, dugongs and a large number of fishes and invertebrates associated with coral reefs, seagrass beds and mangroves are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles and dugongs are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Crab Bay SUMA includes the Crab Bay CCA, which is included in the NBSAP (2018–2030) as an existing nationally registered CCA

3.2.8.7 SITE M7: WIAWI



FIGURE 45. SITE M7: Wiawi

TABLE 50. SITE M7: Wiawi. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Malampa Province	Wiawi	M7	6.5

Geographic boundaries

16.1138°S 167.1755°E, 16.1496°S 167.1922°E

Geographic description (score = 2)

Wiawi is located on the southwestern coast of Malekula Island, and has a broad reef flat and significant beaches. The SUMA extends 4 km along the coastline and 500 m out to sea. A turtle nesting beach extends 100 m inland from the shoreline, including the surrounding distinct beach forest vegetation found parallel to the coast, from the village of Wiawi to Wiliekh.

Justification (score = 1)

Wiawi has been designated as a significant wetland (Government of Vanuatu 2016), known as Nagha Mo Pineia. There is a wide reef flat with seagrasses and the adjoining beaches and beach forest, which provide important nesting and foraging habitats for green and loggerhead turtles (Giesen and King 1997). Wiawi has been recognised for its biodiversity and is included as one of the Key Biodiversity Areas of Vanuatu (USP 2012). This may be the only significant loggerhead turtle habitat in Vanuatu, and there have also been reports of Olive Ridley and hawksbill turtles (Giesen and King 1997). Wiawi is considered regionally important for nesting green turtles (Conant et al. 2009). More information about habitats, including coral reefs and seagrass beds, on the west coast on Malekula is given in Site M5: Bamboo Bay and Dickson Reef, and about turtles in Vanuatu and on Malekula Island, respectively, in Site Q1: Quanlap and Site M1: Vulai Island.

Type and number of sources (score = 2.5)

Because of its unique status as Vanuatu’s only loggerhead turtle nesting beach, five reports provided information directly about the site, and it is mentioned in the NBSAP. Relevant sources were also reviewed for Site M5: Bamboo Bay and Dickson Reef, Site Q1: Quanlap and Site M1: Vulai Island.

Obligations (score = 1)

Obligations to protect turtles exist under the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Turtles are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Wiawi SUMA includes the Wiawi marine tabu/conservation site, which is included in the NBSAP (2018–2030) as a proposed marine site as a national priority for formal protection.

3.2.8.8 SITE M8: PORT STANLEY



FIGURE 46. SITE M8: Port Stanley

TABLE 51. SITE M8: Port Stanley. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Malampa Province	Port Stanley	M8	10.5

Geographic boundaries

16.0683°S 167.4539°E, 16.1608°S 167.4893°E

Geographic description (score = 3)

The eastern side of Malekula is a complex coastline of large headlands sheltering shallow embayments, including Crab Bay, Bushman’s Bay and Port Stanley. The SUMA includes marine areas surrounding the entire northern headland, including the small islands of Tetaka and Staro.

Justification (score = 2)

Malekula’s eastern coastline is fringed with mangroves, soft sediments host seagrass meadows and inshore reefs, and the east facing sides of the headlands have high-energy fringing reefs that drop steeply into deep, oceanic waters (Done and Navin 1990). All the values and attributes associated with Site M6: Crab Bay also apply here, with the difference that customary tenure may be weaker here, and therefore marine resources may be more depleted. The mangroves, seagrass beds, coral reefs and protected species of Crab Bay and the “mainland” side of the bay are also found in this adjacent area.

The entire area of Port Stanley / Bushmans Bay / Crab Bay, designated as a single National wetland site, has 963 ha of mangrove forest; this includes the largest contiguous stand of mangroves in Vanuatu found in Port Stanley (Kalfatak and Jaensch 2014). The most extensive seagrass beds of this coastline have also been recorded around the SUMA (Kalfatak and Jaensch 2014), and 3–10 dugongs are known to frequent the area (Chambers et al. 1989, 1990; VESS 2017).

An ecological survey conducted in this area mapped the extent of exposed, sheltered and intermediate reefs, and found coral cover to range from around 20% on the exposed reefs to less than 10% on the inshore reefs (Friedman et al. 2008). The outer reef supported more species, more fish, larger fish and a larger biomass than the sheltered coastal reef, but herbivores and carnivores were dominant throughout the different habitats. Invertebrates were dominated by mangrove snails, crabs (albeit mostly in Crab Bay), *Tridacna maxima* and the sea cucumber *Stichopus chloronotus*. The large amount of favourable habitat in good condition, and the close proximity of mangroves, seagrass beds and coral reefs, makes this a highly productive and biodiverse area (see Site NO3: Vagtande Island, Site T4: Linua, and Site S1: Palekula to Turtle Bay).

Type and number of sources (score = 2.5)

Six reports contained information about this SUMA. Sources used to describe the attributes of Site NO3: Vagtande Island, Site T4: Linua, Site M6: Crab Bay and Site S1: Palekula to Turtle Bay are also relevant here.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with coral reefs, seagrass beds and mangroves within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. Dugongs and a large number of fishes and invertebrates associated with coral reefs, seagrass beds and mangroves are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles and dugongs are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Port Stanley SUMA includes the Aop PRV marine tabu/conservation site, which is included in the NBSAP (2018–2030) as a proposed marine site as a national priority for formal protection.

3.2.8.9 SITE M9: LAMANGO (LIMBENWEN)

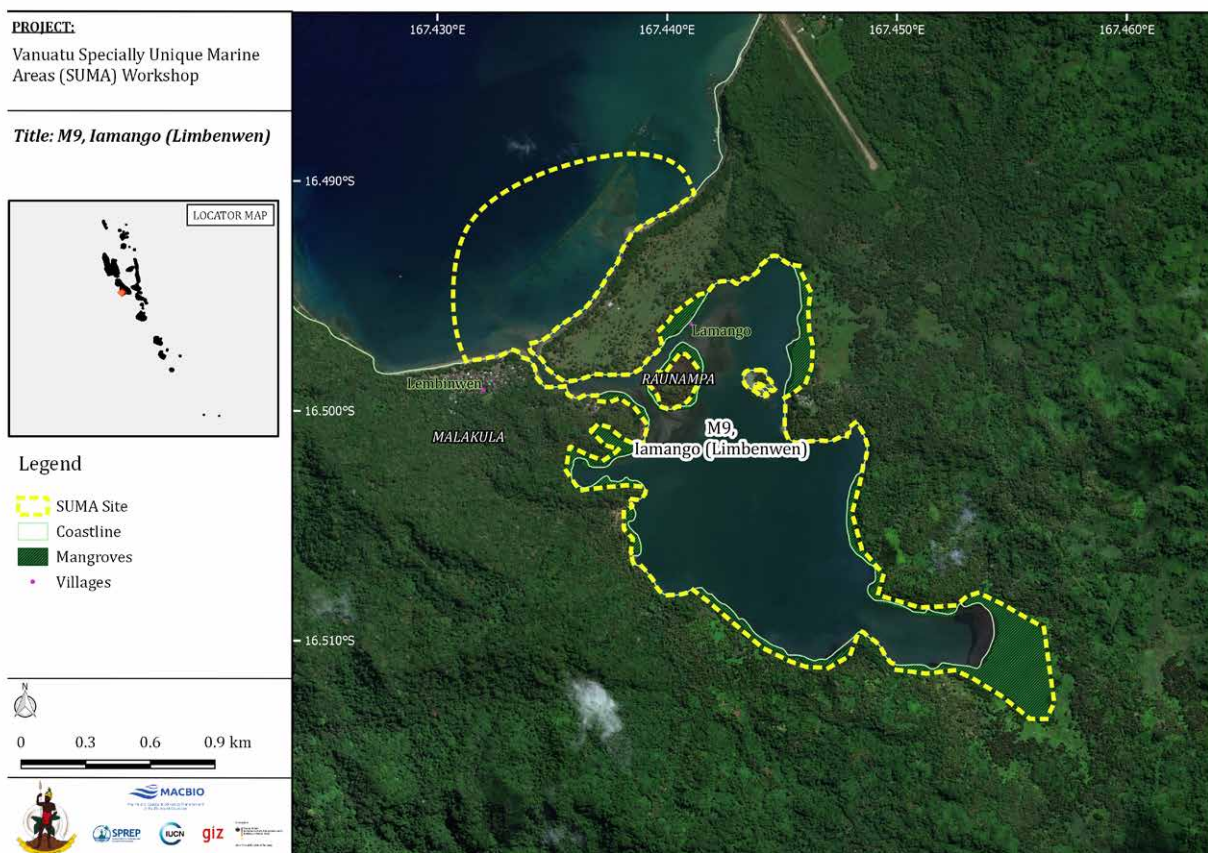


FIGURE 47. SITE M9: Lamango (Limbenwen)

TABLE 52. SITE M9: Lamango (Limbenwen). Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Malampa Province	Lamango (Limbenwen)	M9	9

Geographic boundaries

16.4854°S 167.4389°E, 16.5195°S 167.4492°E

Geographic description (score = 3)

This SUMA, also known as Tisri Lagoon, includes a large tidal lagoon which is almost enclosed, except for a narrow passage to the sea at the northern end. The lagoon measures 194 ha and is ringed with mangroves. The lagoon includes three islands, one near the start of the channel and two others supporting mangroves. The SUMA also includes a small area of inshore marine habitats at the entrance of the lagoon.

Justification (score = 1.5)

Tisri Lagoon and the surrounding mangroves and adjacent inshore marine habitats are recognised as having physically and biologically outstanding wetland attributes; it is among the wetlands in Vanuatu being considered for protection as a Ramsar site (Kalfatak and Jaensch 2014). The water in the lagoon is between saline and brackish, depending on tidal flushing from South West Bay and rainwater input (Kalfatak and Jaensch 2014). The mangrove forest that surrounds the shores is dominated by *Rhizophora seilala*, *R. stylosa*, *R. apiculata*, *R. lamarcki*, *R. samoensis*, *Ceriops tagal* and *Avicennia marina*. The mangroves support a rich invertebrate fauna dominated by molluscs, crustaceans and polychaetes, as well as abundant mullets. This type of wetland is considered rare in Vanuatu, and is known as a nursery area for fishes and crustaceans, safeguarded by an effective tabu area (Kalfatak and Jaensch 2014). Reef herons (*Egretta sacra*), wild ducks and pelicans are known to visit the site, and dugongs and hawksbill turtles occur in South West Bay, which is the bay just outside the channel leading to the lagoon (Chambers et al. 1989; Siota 2015). Coral reefs in South West Bay are the same as described in Site M5: Bamboo Bay and Dickson Reef; the sheltered back reef habitats are considered important for juvenile fishes (Coward et al. 2014).

Type and number of sources (score = 1.5)

Four reports provided information directly about the wetlands in this SUMA. A further report studied habitats adjacent to the SUMA, and this and other sources used for Site M5: Bamboo Bay and Dickson Reef are also relevant here.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with coral reefs, seagrass beds and mangroves within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. An existing traditional tabu area is active in this SUMA. Turtles, dugongs and a large number of fishes and invertebrates associated with coral reefs, seagrass beds and mangroves are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles and dugongs are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Lamango (Limbenwen) SUMA includes the Limbenwen marine tabu/conservation site, which is included in the NBSAP (2018–2030) as a proposed marine site as a national priority for formal protection.

3.2.8.10 SITE M10: SOUTHEAST MALEKULA

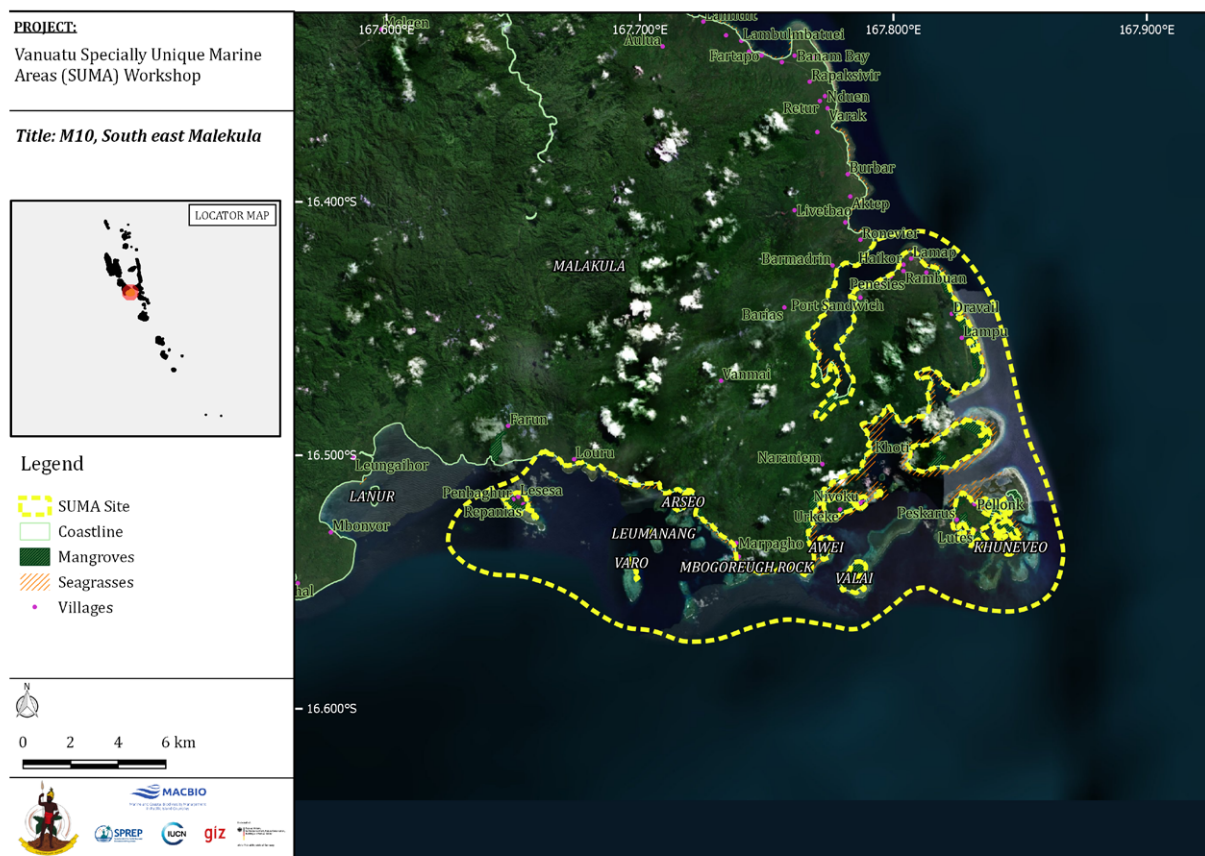


FIGURE 48. SITE M10: Southeast Malekula

TABLE 53. SITE M10: Southeast Malekula. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Malampa Province	Southeast Malekula	M10	11

Geographic boundaries

16.5258°S 167.6183°E, 16.532°S 167.8989°E

Geographic description (score = 2)

The southeast Malekula SUMA includes waters from Farun to the northern side of Port Sandwich Bay, and encompasses all the islands, including all the Maskelyne Islands. It extends between 2 and 5 km off the coast. This SUMA overlaps with M1–4.

Justification (score = 3)

Southeast Malekula was chosen by workshop participants because it provides ideal habitat for dugongs, but it also includes the Maskelynes Archipelago, which has been classified as a Key Biodiversity Area and contains a number of marine protected areas (USP 2012). It represents a complex seascape of coral reef, mangrove and seagrass habitats in different degrees of shelter and exposure, and the proximity of these habitats to each other are likely to lead to high connectivity and biodiversity overall (Olds et al. 2016).

Attributes that pertain to this entire SUMA have been described in Site M1: Vulai Island, Site M2: Ringi Te Suh giant clams, Site M3: Gaspard Bay dugong garden and Site M4: Arab Bridge. Descriptions of these SUMAs include biophysical characteristics that apply across the entire area; this SUMA therefore highlights the importance of the area as a whole, together with the special and unique nature of the attributes specific to the smaller SUMAs.

Type and number of sources (score = 3)

The attributes of this SUMA as a whole are described in four smaller SUMAs that overlap with it: Site M1: Vulai Island, Site M2: Ringi Te Suh giant clams, Site M3: Gaspard Bay dugong garden and Site M4: Arab Bridge. Sources used for these SUMAs also apply here.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with coral reefs, seagrass beds and mangroves within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. Turtles, dugongs and a large number of fishes and invertebrates associated with coral reefs, seagrass beds and mangroves are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles and dugongs are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Southeast Malekula SUMA includes the Lamap and Ringi Te Suh marine tabu/conservation sites which are included in the NBSAP (2018–2030) as proposed marine sites as a national priority for formal protection.

3.2.9 Inshore: Malampa Province, Ambrym Island

3.2.9.1 SITE M11: MARANATHA



FIGURE 49. SITE M11: Maranatha

TABLE 54. SITE M11: Maranatha. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Malampa Province	Maranatha	M11	5

TABLE 55. SITE M12: North Ambrym. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Malampa Province	North Ambrym	M12	5.5

Geographic boundaries

16.0911°S 168.1269°E, 16.1139°S 168.1877°E

Geographic description (score = 2)

This SUMA includes a ~10km stretch of the northern coast of Ambrym Island. It includes the shallow marine habitats out to approximately 1 km from the shore.

Justification (score = 1)

The extensive seagrass beds on the shallow coral reef flats are feeding grounds for a number of small groups of dugongs (Chambers et al. 1989). Due to the relatively low level of human habitation compared to larger islands, seagrass beds are likely to be less impacted by chronic pressures such as sedimentation. The northern part of Ambrym Island area has been recognised for its biodiversity and is included as one of the Key Biodiversity Areas of Vanuatu (USP 2012); it is also the only area around Ambrym Island that has been designated as having suitable habitat (medium priority) for dugongs (VESS 2017). General information about dugongs in general, and their distribution in Vanuatu, is reviewed for Site T8: Reef Islands.

Type and number of sources (score = 1.5)

Very little information exists about marine biophysical attributes of Ambrym Island. Two reports reported the presence of dugongs in this SUMA, and one listed it among Vanuatu’s Key Biodiversity Areas. Sources used for Site T8: Reef Islands are also relevant here.

Obligations (score = 1)

There are obligations to protect and sustainably manage dugongs within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Dugongs are listed under CITES, and classified as Vulnerable and on the IUCN Red List of Threatened Species.



3.2.9.3 SITE M13: NORTHWEST AMBRYM

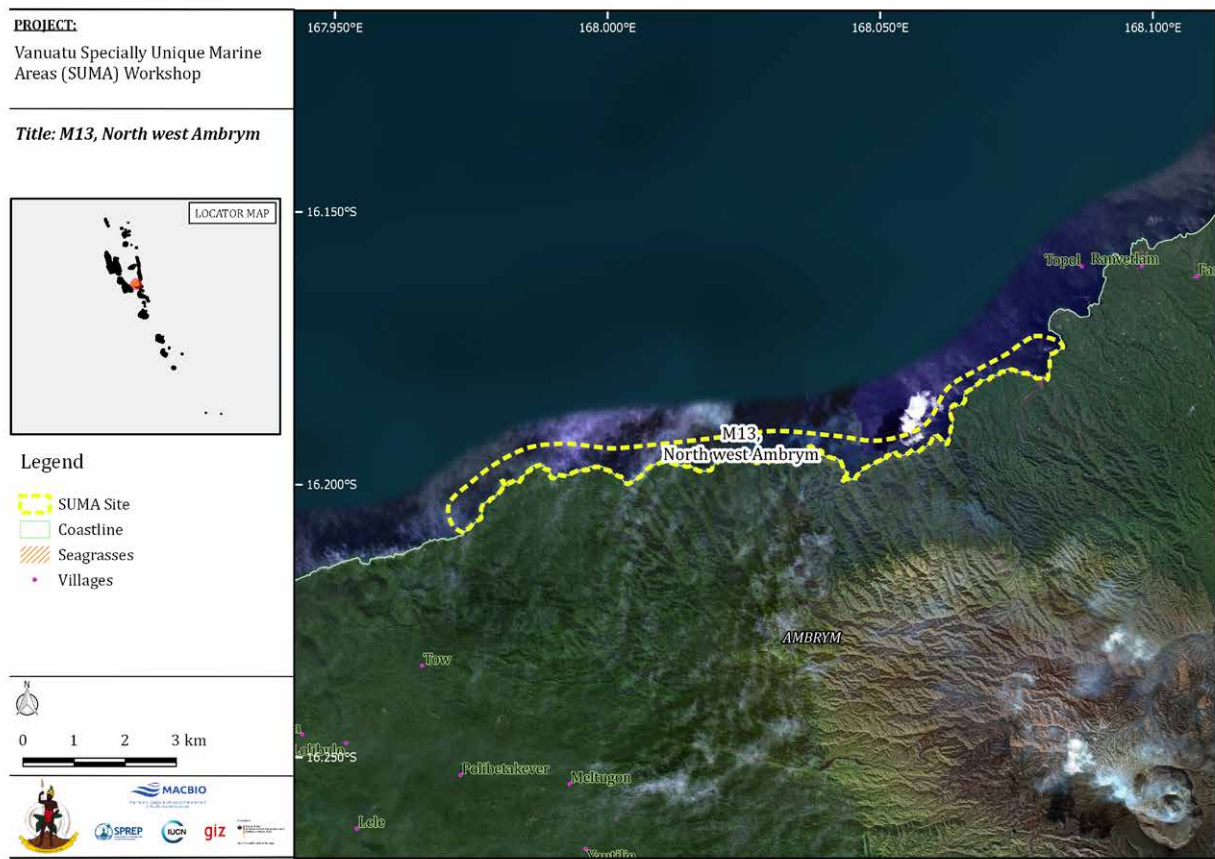


FIGURE 51. SITE M13: Northwest Ambrym

TABLE 56. SITE M13: Northwest Ambrym. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Malampa Province	Northwest Ambrym	M13	5

Geographic boundaries

16.1968°S 167.9689°E, 16.1899°S 168.0869°E

Geographic description (score = 2)

This SUMA includes a ~20km stretch of the northwestern coast of Ambrym Island. It includes the shallow marine habitats out to approximately 1 km from the shore.

Justification (score = 1)

Expert workshop participants identified this SUMA for its importance for foraging turtles. Green and hawksbill turtles have been recorded foraging in low numbers around the island (Siota 2015). The northern part of Ambrym Island area has been recognised for its biodiversity and is included as one of the Key Biodiversity Areas of Vanuatu (USP 2012). General information about turtles in general, and their distribution in Vanuatu, is reviewed for Site Q1: Quanlap.

Type and number of sources (score = 1)

Very little information exists about marine biophysical attributes of Ambrym Island. One report noted the presence of turtles around the island, and one listed it among Vanuatu’s Key Biodiversity Areas. Sources used for Site Q1: Quanlap are also relevant here.

Obligations (score = 1)

There are obligations to protect and sustainably manage marine turtles within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Turtles are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles.

3.2.10 Inshore: Malampa Province, Paama Island

3.2.10.1 SITE M14: WAILEP

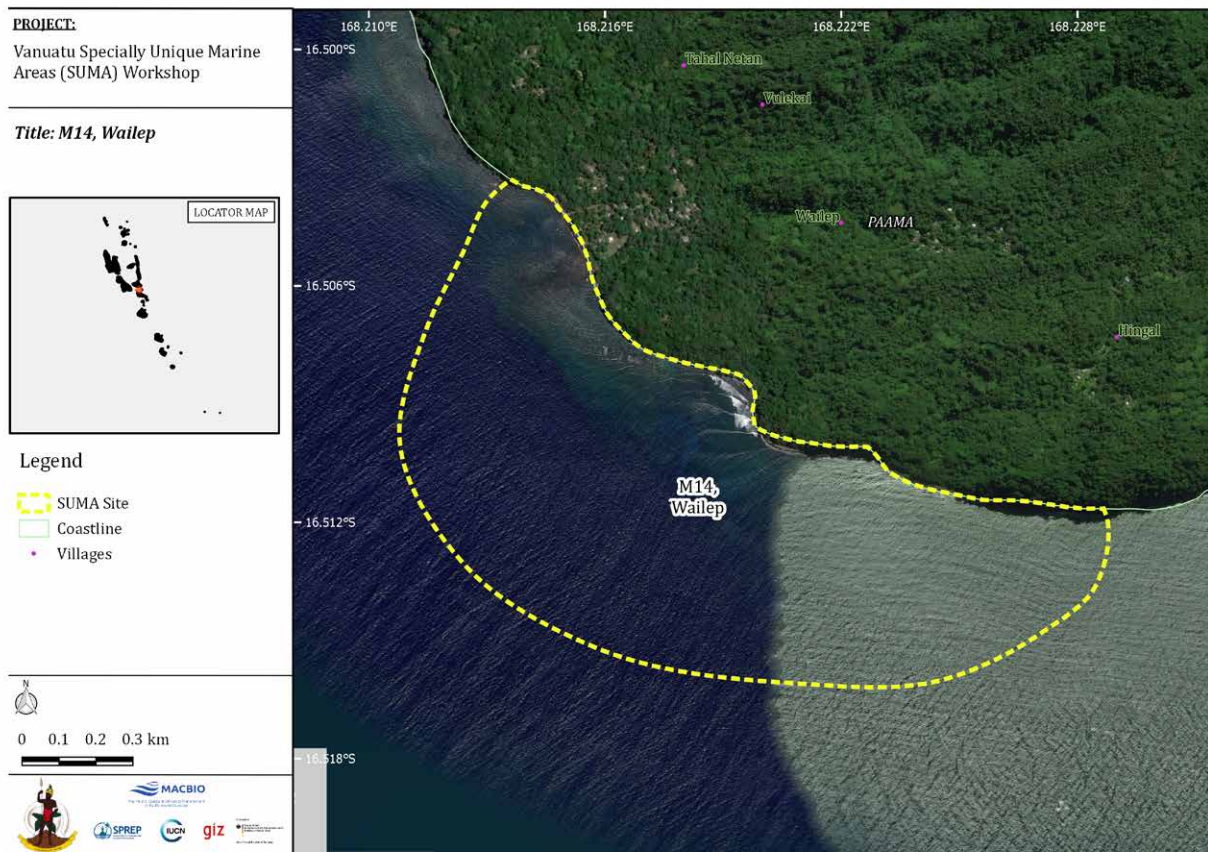


FIGURE 52. SITE M14: Wailep

TABLE 57. SITE M14: Wailep. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Malampa Province	Wailep	M14	4.5

Geographic boundaries

16.5031°S 168.2134°E, 16.5203°S 168.2247°E

Geographic description (score = 2)

Wailep is located on the southwestern coast of Paama Island. The SUMA includes marine habitats along just under 3 km of the coastline, and extends 1 km out to sea.

Justification (score = 1)

Expert workshop participants identified this SUMA for its importance for nesting turtles and wetland attributes. Very few records exist of turtles foraging around the island (Siota 2015). General information about turtles in general, and their distribution in Vanuatu, is reviewed for Site Q1: Quanlap.

Type and number of sources (score = 0.5)

Very little information exists about marine biophysical attributes of Paama Island. One report noted the presence of unidentified turtles around the island. Sources used for Site Q1: Quanlap are also relevant here.

Obligations (score = 1)

There are obligations to protect and sustainably manage marine turtles within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Turtles are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles.

3.2.11 Inshore: Shefa Province, Epi Island

This region includes the Shepherds outer islands, Epi, and Efate outer islands of Shefa.

3.2.11.1 SITE EP1: LAMEN AND ROVO BAYS

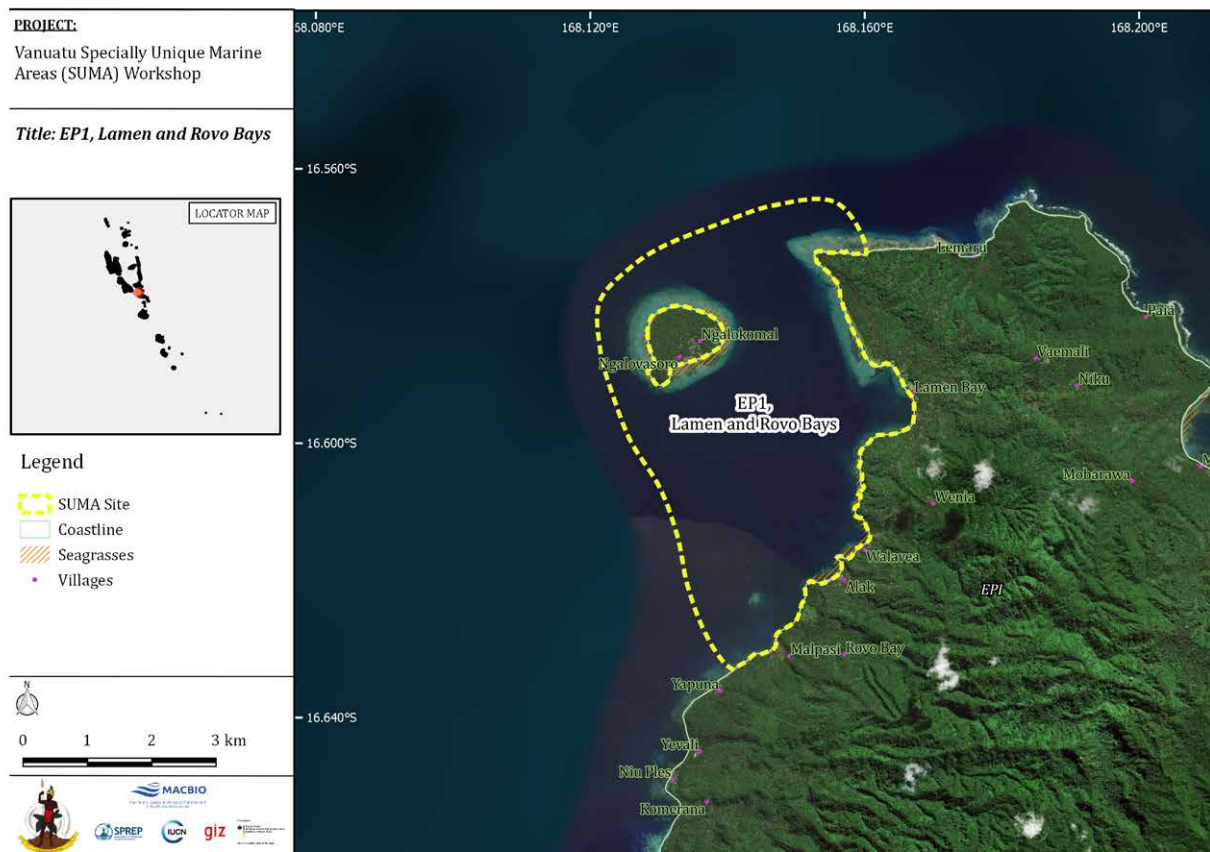


FIGURE 53. SITE EP1: Lamen and Rovo Bays

TABLE 58. SITE EP1: Lamen and Rovo Bays. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Lamen and Rovo Bays	EP1	12

Geographic boundaries

16.5613°S 168.1564°E, 16.6339°S 168.1387°E

Geographic description (score = 3)

Lamen and Rovo Bays are sheltered bays on the northwestern and western sides of Epi Island. The SUMA encompasses approximately 8 km of coastline and the adjacent marine area out to ~5 km. The SUMA includes the fringing reef around a small island (Lamen Island) just offshore. The coast of both Epi and Lamen islands is fringed with mangroves and coral reef.

Justification (score = 3)

This SUMA was identified by workshop participants as having coral reefs, abundant fishes, mangroves, seagrass beds, turtles and dugongs in close proximity. There are also human settlements within the SUMA, along the coastline. However, a 2011 assessment of threats to Vanuatu's coral reefs rated the threat index on Epi Island as low (Chin et al. 2011); among Pacific Island nations, fringing reefs of inhabited islands that remain healthy are rare and special.

The values of coral reefs in Vanuatu generally were described in Site NO3: Vagtande Island. However, while those reefs are isolated, with no nearby human settlements and subject to oceanic influences, the coral reefs in this SUMA are fringing reefs along an inhabited coastline. Reefs around Epi Island have also been affected by COTs (Houk and Raubani 2010), and cyclones (Johnson et al. 2017), and two monitoring sites were established between 2003 and 2004 (Chin et al. 2011). Surveys between 2006 and 2007 recorded 40% coral cover on Epi, which was relatively high compared with other surveyed islands (Raubani 2009; Chin et al. 2011). Epi Island reefs are reported to lack the full complement of habitats typical of island fringing reef systems; nevertheless, a total of 40 mobile invertebrate benthic species were recorded there, dominated by smaller gastropods (24 species), 9 species of sea cucumber, 2 of bivalve, 1 crustacean, 1 octopus, and 3 species each of starfish and urchins (Pakoa et al. 2009). The Lamen Bay portion of Epi's coastline was found to have less than 20% live coral cover; pavement and dead coral dominated the substrate composition (Pakoa et al. 2009).

Lamen Bay is under customary marine management, with initiatives involving a trochus closure and past finfish and turtle closures (Johannes and Hickey 2004); trochus populations are relatively healthy compared to other areas (Raubani 2009), although they remain low (Pakoa et al. 2009). Vanuatu has a strong heritage of customary marine resource management, including legally recognised customary marine tenure systems that allow village custodians to control activities in their fishing grounds using traditional seasonal and species closures, tabu areas, behavioural prohibitions, food avoidance, and refugia (Vierros et al. 2010).

Sea cucumbers surveys detected nine species of sea cucumbers in Lamen Bay (Pakoa et al. 2009). There is some information about fish abundance on Epi in general, and it suggests that although carnivores have probably been depleted, there are relatively high abundances of herbivorous fishes such as parrotfishes and surgeonfishes (Raubani 2009).

Aside from Malekula Island, mangroves in Vanuatu are distributed in small patches. Epi Island, with 60 ha, is one of the islands that have sizeable stands of mangroves (Kalfatak and Jaensch 2014), making it likely that this ecosystem is more functional and valuable than in other areas of Vanuatu. Mangroves in Vanuatu are described in more detail in Site T4: Linua. Marine areas where seagrass, mangrove and coral reef habitats exist in close proximity are especially valuable, as described in Site S1: Palekula to Turtle Bay.

Nesting and foraging green and hawksbill turtles have been tagged on Epi Island since the 1990s, with approximately 119 individuals of various species tagged annually (Siota 2010, 2012, 2014, 2015). In 2007, it was discovered that the black sand beaches of Epi Island host some of the highest densities of nesting leatherback turtles in Vanuatu (Petro et al. 2007). Information about seagrass beds and turtles in Vanuatu is reviewed in Site T4: Linua and Site Q1: Quanlap. Lamen Bay is one of nineteen identified hotspots for dugongs in Vanuatu, with at least 10 dugongs reported as residing in the bay (Chambers et al. 1989; Government of Vanuatu 2016; VESS 2017).

Type and number of sources (score = 3)

This SUMA had the benefit of some information sourced directly from the site. Six reports contained information about attributes of the SUMA selected by the workshop participants (reefs, reef invertebrates, dugongs and customary management). Two peer-reviewed papers and seven reports had information about the general Epi Island area. General and Vanuatu sources used for Site NO3: Vagtande Island, Site T4: Linua, Site Q1: Quanlap and Site S1: Palekula to Turtle Bay are also relevant here.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with coral reefs, seagrass beds and mangroves within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. Lamén Bay has been subject to customary management in the form of a trochus fishing closure and some families choosing to close their finfish grounds. Turtles, dugongs and a large number of fishes and invertebrates associated with coral reefs, seagrass beds and mangroves are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles and dugongs are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Lamén and Rovo Bays SUMA site includes Lamén Island marine tabu/conservation site, which is included in the NBSAP (2018–2030) as a proposed marine site as a national priority for formal protection.

3.2.11.2 SITE EP2: POKKOVIA



FIGURE 54. SITE EP2: Ponkovia

TABLE 59. SITE EP2: Ponkovia. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Ponkovia	EP2	9

Geographic boundaries

16.6735°S 168.1187°E, 16.6567°S 168.1319°E

Geographic description (score = 2)

Ponkovia is a village on the western side of Epi Island; the SUMA includes the coastline north and south of the village and the marine habitat directly off the coast. The SUMA extends for 2.2 km along the coastline and approximately 1 km out to sea.

Justification (score = 2)

The beach, coral reef and marine habitats just off the coast of Ponkovia were chosen for similar reasons as Lamén and Rovo Bays; there are coral reefs in good condition, dugongs and turtles. Country-wide surveys have identified this as a high priority area for dugongs (VESS 2017). This SUMA was also identified as having healthy trochus populations (see Site T7: Divers' Bay).

The fringing coral reefs appear more extensive to those in Lamén Bay further north, with a steep slope or wall into deep water, which is often favourable habitat for reef fishes. All the information gathered for the relevant habitats and species on Epi Island (see Site EP1: Lamén and Rovo Bays) are also relevant here; there was no further information available specifically about Ponkovia.

Type and number of sources (score = 2.5)

One report mentioned the tabu area off the village, established in the late 1980s to protect marine resources, and one map shows the level of priority for dugong populations. Two peer-reviewed papers and seven reports had information about the general Epi Island area. Three peer-reviewed papers, two reports and one website described the SUMA attributes for Vanuatu, a further ten peer-reviewed sources were used as general background information. General and Vanuatu sources used for Site NO3: Vagtande Island, Site T4: Linua, Site T7: Divers' Bay, Site Q1: Quanlap, Site S1: Palekula to Turtle Bay and Site EP1: Lamén and Rovo Bays are also relevant here.

Obligations (score = 2.5)

There are obligations to protect and sustainably manage species associated with coral reefs within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Turtles, dugongs and a large number of fishes and invertebrates associated with coral reefs are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles and dugongs are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles.



3.2.11.3 SITE EP3: TALIKO

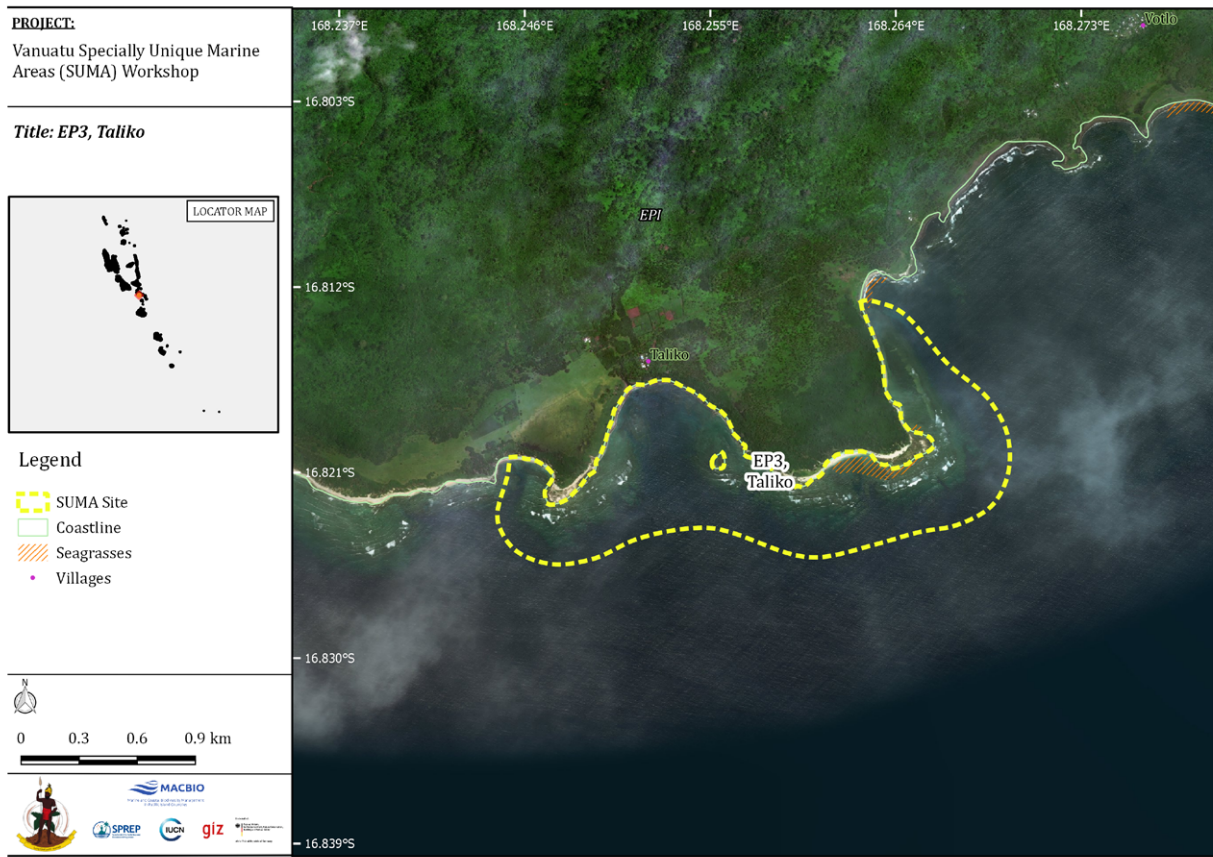


FIGURE 55. SITE EP3: Taliko

TABLE 60. SITE EP3: Taliko. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Taliko	EP3	5.5

Geographic boundaries

16.8197°S 168.2433°E, 16.8222°S 168.2706°E

Geographic description (score = 1)

Taliko is a large headland on the south-facing coast of Epi Island, with a coastline of black sand beaches and a narrow fringing coral reef. The SUMA extends approximately 6.5 km along the coastline around the headland, and slightly less than 1 km out to sea, including the shallow reef. Votlo village is located on the eastern side of the headland.

Justification (score = 1)

Taliko's beaches have special value for nesting hawksbill, green and leatherback turtles. For information about turtles in Vanuatu and on Epi Island in particular, see Site Q1: Quanlap and Site EP1: Lamén and Rovo Bays. The beach at Votlo Village, which lies within this SUMA, has been a site for research and tagging on nesting turtles (Siota 2015). Reports of nesting turtles include between 1 and 6 green turtles and 1–4 leatherback turtles annually from 2002 to 2013 (Siota 2015). There may be as many as 20–30 nesting hawksbill turtles, but the exact number is unknown (Amos 2007). In December 2002, a research team recorded 48 turtle nests; 31 were laid by leatherback turtles, 15 by green turtles and two by hawksbill turtles (Petro et al. 2007). Votlo Village is a protected area for leatherback turtles (Government of Vanuatu 2016).

The Votlo Village area is also thought to host aggregations of mangru, or small pelagic mackerel than tend to school close to the shore (workshop participants, pers. comm.).

Type and number of sources (score = 2.5)

There was direct information about turtles within this SUMA from three reports and one peer-reviewed paper. Sources used for turtles in Vanuatu and on Epi Island for Site Q1: Quanlap and Site EP1: Lamén and Rovo Bays are also relevant here.

Obligations (score = 1)

There are obligations to protect and sustainably turtles within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Turtles are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Taliko SUMA includes the Votlo and Wampi marine tabu/conservation sites, which are included in the NBSAP (2018–2030) as proposed marine sites as a national priority for formal protection.

3.2.11.4 SITE EP4: MAVILAO



FIGURE 56. SITE EP4: Mavilao

TABLE 61. SITE EP4: Mavilao. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Mavilao	EP4	8

Geographic boundaries

16.7355°S 168.1505°E, 16.7639°S 168.1469°E

Geographic description (score = 2)

This SUMA encompasses the coast and inshore marine area north and south of Mavilao Village, on the southeastern side of Epi Island. The SUMA extends approximately 3.5 km along the coastline, and around 1 km out to sea, including the shallow reef.

Justification (score = 2)

The beach, coral reef and marine habitats just off the coast of Mavilao were chosen for similar reasons as Lamén and Rovo Bays; there are coral reefs in good condition, good habitat for trochus, green snail and finfish, and nesting and foraging habitat for turtles. The fringing coral reefs appear similar to those of Ponkovia further north, with a steep slope or wall into deep water, which is often favourable habitat for reef fishes. Green snail (*Turbo marmoratus*) is highly prized in Melanesian subsistence fisheries; in Vanuatu it was fished nearly to extinction prior to a moratorium on its collection (UniQuest Pty Ltd 2010). Areas where it remains abundant indicate a healthy reef system that has retained at least some of its key invertebrate species. All the information gathered for the relevant habitats and species on Epi Island (see Site EP1: Lamén and Rovo Bays and Site T7: Divers' Bay) are also relevant here. No additional information was found for this SUMA.

Type and number of sources (score = 2)

Two peer-reviewed papers and seven reports had information about the general Epi Island area. Three peer-reviewed papers, three reports and one website described the SUMA attributes for Vanuatu, a further 10 peer-reviewed sources were used as general background information. General and Vanuatu sources used for Site NO3: Vagtande Island, Site Q1: Quanlap, Site EP1: Lamén and Rovo Bays and Site T7: Divers' Bay are also relevant here.

Obligations (score = 2)

There are obligations to protect and sustainably manage species associated with coral reefs within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Turtles and a large number of fishes and invertebrates associated with coral reefs are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Mavilao SUMA includes the Mavilao marine tabu/conservation site, which is included in the NBSAP (2018–2030) as an existing marine conservation site.



3.2.11.5 SITE EP5: MORIU TO NUVI

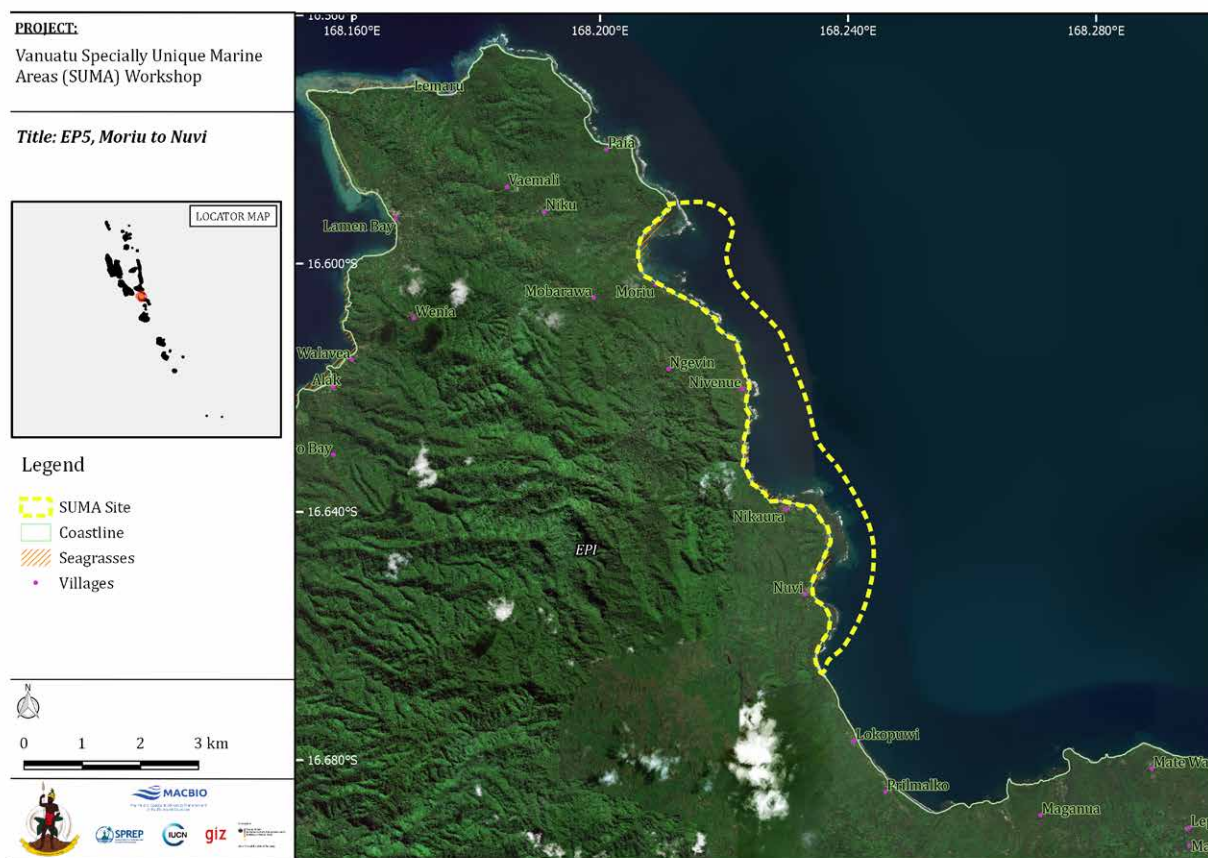


FIGURE 57. SITE EP5: Moriu to Nuvi

TABLE 62. SITE EP5: Moriu to Nuvi. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Moriu to Nuvi	EP5	9

Geographic boundaries

16.587°S 168.2189°E, 16.666°S 168.2355°E

Geographic description (score = 2)

This SUMA incorporates a stretch of coastline and associated shallow marine habitats on the northeastern side of Epi Island, extending roughly from Moriu Village at the northern end to Nuvi Village in the south. There is an extensive fringing reef along the entire SUMA, which includes approximately 11.5 km of coastline and marine habitats out to approximately 1 km.

Justification (score = 2)

The northern part of Epi Island is classified as a Key Biodiversity Area, which includes habitats fringing the coastline, and this SUMA is included in it. It also contains the Nikaura Marine Protected Area, established in 2000 to protect “dugongs and marine life” (USP 2012; Government of Vanuatu 2016) and to promote healthy coral reefs for tourism (Wantok Environment Centre 2009b). In the past, coral cover has been high at 63% (UniQuest Pty Ltd 2010). This is also one of the key fishing areas of the Deep-Bottom Fish Fishery (Vanuatu Fisheries Department 2016), suggesting a highly productive area just beyond the reef edge. The SUMA has been a site for research and tagging on nesting turtles (Siota 2015). Tagged turtles between 2002 and 2015 include between 1 and 5 hawksbill turtles annually (Siota 2015), suggesting that turtles also forage near this nesting beach. The northern part of the SUMA is classified as a high priority dugong habitat (VESS 2017). Coconut crabs are also thought to be abundant here. For more information about coconut crabs in Vanuatu, see Site T1: Metoma Island.

All the information gathered for the relevant habitats and species on Epi Island (see Site EP1: Lamén and Rovo Bays and Site T7: Divers' Bay) are also relevant here as this SUMA also includes fringing reefs, mangroves and seagrass. No additional information was found for this SUMA.

Type and number of sources (score = 2)

Six reports and one website mention the attributes of this SUMA directly, but descriptions are vague and uninformative. Two reports were used to describe coconut crabs more generally, and for Vanuatu. General, Vanuatu and Epi Island sources used for Site NO3: Vagtande Island, Site T1: Metoma Island, Site T4: Linua, Site Q1: Quanlap and Site EP1: Lamén and Rovo Bays and Site T7: Divers' Bay are also relevant here.

Obligations (score = 3)

In 2000, the Nikaura Marine Protected Area was established to protect “dugongs and marine life”. There are obligations to protect and sustainably manage species associated with coral reefs within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Turtles, dugongs and a large number of fishes and invertebrates associated with coral reefs are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles and dugongs are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Moriu to Nuvi SUMA includes the Moriu, Nuvi and Nikaura marine tabu/conservation sites, which are included in the NBSAP (2018–2030) as existing marine conservation sites.

3.2.12 Inshore: Shefa Province, Tongoa Island

3.2.12.1 SITE TON1: LAIKA ISLAND

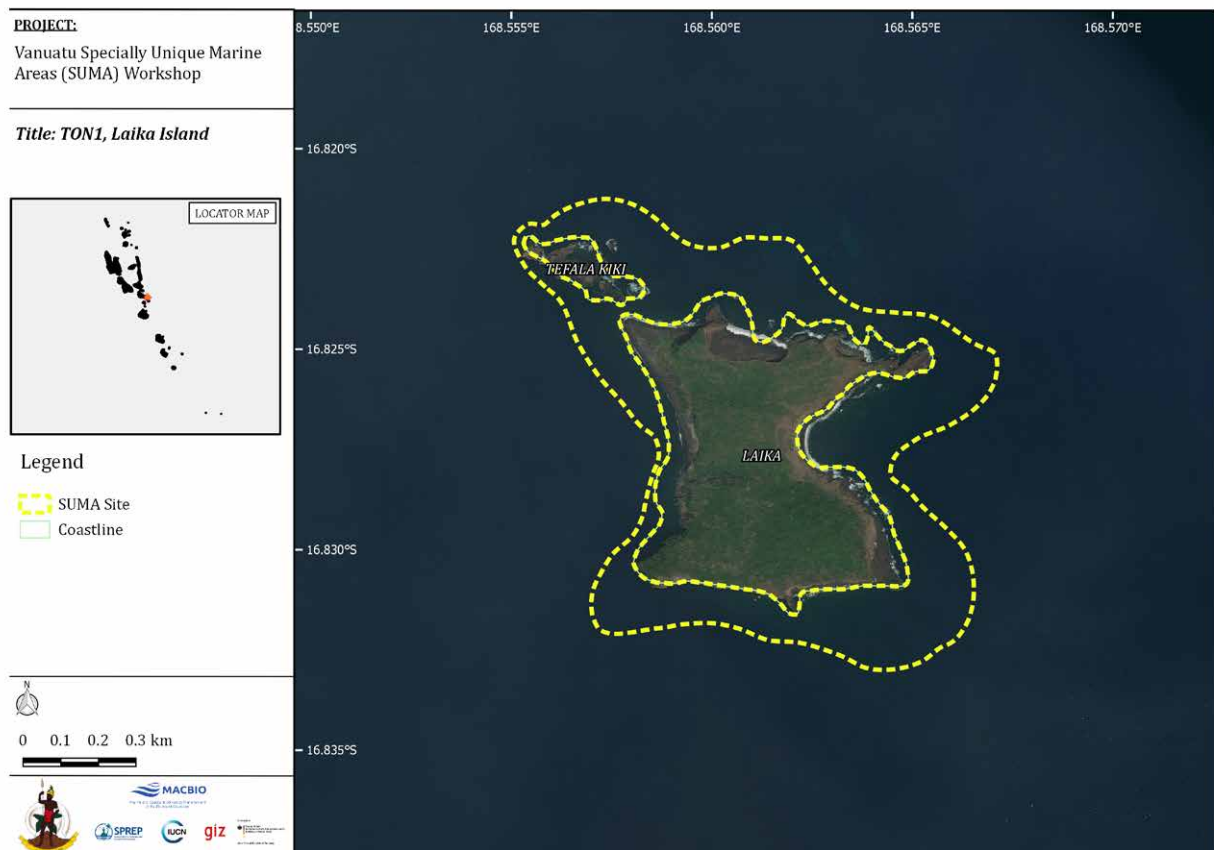


FIGURE 58. SITE TON1: Laika Island

TABLE 63. SITE TON1: Laika Island. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Laika Island	TON1	7.5

Geographic boundaries

16.821°S 168.5552°E, 16.8333°S 168.5662°E

Geographic description (score = 3)

Laika Island is a small, uninhabited island approximately 3.5 km north of Tongoa Island. It is 700 m long and 500 m wide, with a large embayment facing east, and is fringed by coral reefs. It is located at the eastern edge of the Vanuatu shelf, facing deep oceanic waters to the east. The SUMA includes the marine habitats surrounding the island, out to the edge of the coral reef.

Justification (score = 1.5)

Laika Island is considered one of Vanuatu’s national conservation and biodiversity hotspots (Government of Vanuatu 2016); it provides nesting habitat for sea birds and black crabs, and surrounding waters support pelagic fish aggregations. Laika Island has been recognised for its biodiversity and is included as one of the Key Biodiversity Areas of Vanuatu (USP 2012). A bird checklist for the SUMA has identified at least two species, wedge-tailed shearwaters and red-tailed tropicbirds, on Laika Island. Several hundred wedge-tailed shearwaters breed on the island between late October and June each year, and red-tailed tropicbirds have at least attempted to breed there (Tarburton 2012; Phillips 2016). See Site NO3: Vagtande Island for more information about seabirds in Vanuatu.

No information was available for pelagic fishes around this area, but catch reconstruction data show that tuna, billfish and shark catches are highest in the offshore waters east of these islands (Sea Around Us Project 2016a). Since many pelagic species periodically aggregate in areas of high productivity, often where topography changes abruptly around seamounts or islands, this indicates a likely aggregation area around Laika Island (see Site NO1: Northwest part of Santo).

Type and number of sources (score = 1)

Two websites and three reports mentioned Laika Island, with very little detail provided. Sources used for Site NO1: Northwest part of Santo and Site NO3: Vagtande Island also apply here to help infer the special, unique attributes of the site.

Obligations (score = 2)

Corals, fish and invertebrates found on coral reefs are subject to regulations under the Fisheries Management Act 2014, and many are listed under the IUCN Red List of Threatened Species, the Vanuatu International Trade (Flora and Fauna) Act 1962, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Many of Vanuatu’s seabirds are also listed under the acts above. Vanuatu also has a National Plan of Action (NPOA) to reduce incidental catches of seabirds in longline fisheries. Birds are further protected under Vanuatu’s Wild Bird (Protection) Act Cap 30, but this applies mostly to land-based birds. The Fisheries Management Act 2014 outlines obligations for the protection and sustainable use of fish stocks, including pelagic, demersal and deep-water species. The IUCN Red list includes the four species of tuna that aggregate at the site, skipjack tuna are listed as Least Concern, yellowfin and albacore tuna are Near Threatened and bigeye tuna are Vulnerable. The Laika SUMA includes the Laika terrestrial and marine tabu/conservation site, which is included in the NBSAP (2018–2030) as a proposed conservation site as a national priority for formal protection.

3.2.12.2 SITE TON2: LUPALEA (TONGOA WALL)

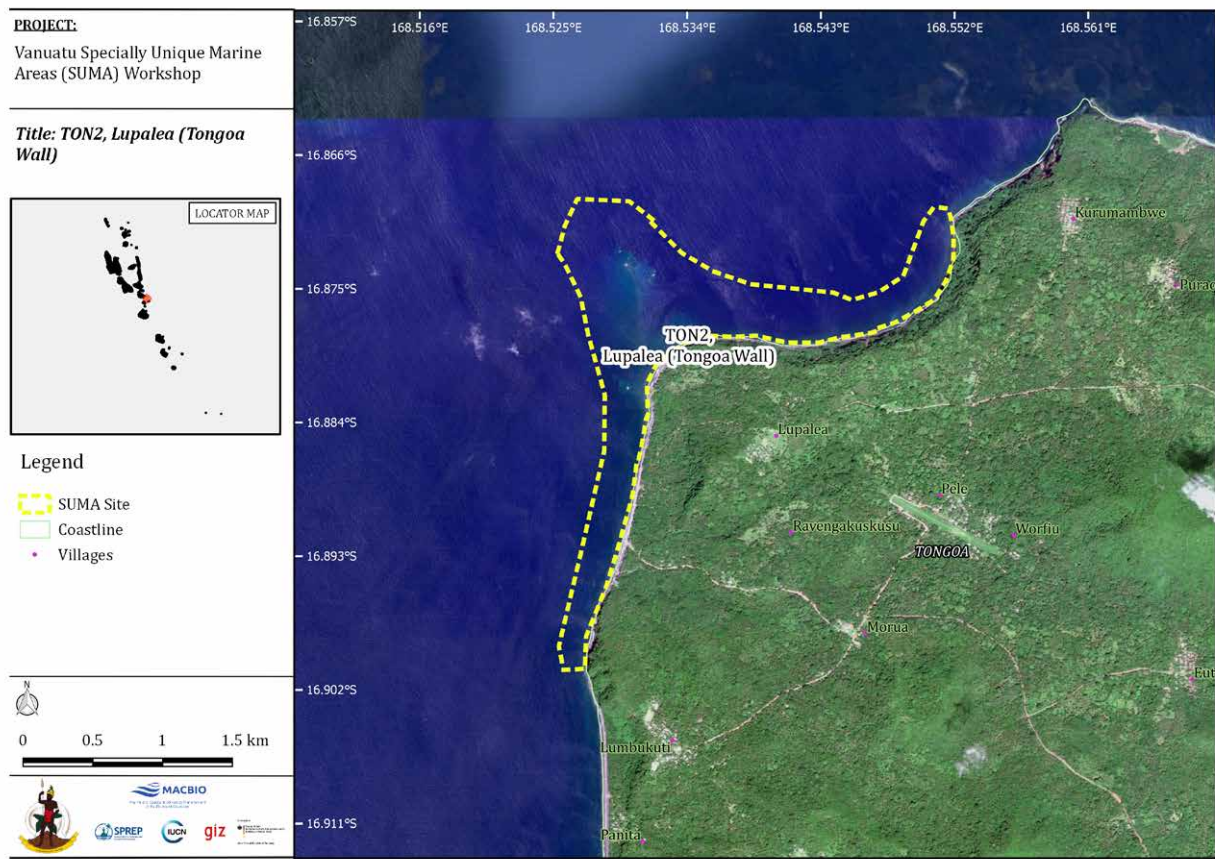


FIGURE 59. SITE TON2: Lupalea (Tongoa wall)

TABLE 64. SITE TON2: Lupalea (Tongoa wall). Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Lupalea (Tongoa wall)	TON2	8.5

Geographic boundaries

16.9007°S 168.5253°E, 16.869°S 168.5519°E

Geographic description (score = 3)

Tongoa Island (also known as Kuwae) is 9 by 6 km in size, and is surrounded by black sand beaches and fringing coral reef. The SUMA encompasses a submarine caldera supporting a coral reef that extends north from the northwest-facing side of the island, known as the Tongoa Wall, and deep waters adjacent to the reef.

Justification (score = 2)

The Tongoa Wall is a well-known and popular dive site due to its striking coral reef topography and vibrant coral communities into deep waters; it is also considered one of Vanuatu’s conservation and biodiversity hotspots (Government of Vanuatu 2016). The reef structure is characterised by walls, overhangs and canyons (EnezGreen 2016). Divers report abundant soft corals, gorgonian fans (Yachts in Transit 2014) and frequent encounters with predators, such as dogtooth tuna and whitetip reef sharks (EnezGreen 2016). The abrupt topography of this area, and proximity to deepwater habitats, increases the likelihood that this area is highly productive, attracting aggregations of pelagic species (see Site NO1: Northwest part of Santo).

Workshop participants also identified this coral reef as hosting deepwater corals, suggesting the potential for mesophotic coral reef development. Advances in technology have recently allowed the beginnings of scientific research

on mesophotic coral reef ecosystems, which typically develop at depths greater than 130 m. These reefs are thought to be extensions of shallow coral ecosystems, and share common species (Turner et al. 2017). They may serve as potential sources to reseed or replenish degraded shallow-water reef species, as they are less susceptible to the impacts typical in shallow waters, such as temperature stress and storm damage (Laverick and Rogers 2018). Mesophotic coral ecosystems also provide essential spawning, breeding, feeding and growing habitat for some economically and ecologically important fish species (Sih et al. 2017). Coral reefs that drop steeply into deep waters, such as those within this SUMA, are likely to have significant mesophotic reef development. The Tongoa-Laika area has been recognised for its biodiversity and is included as one of the Key Biodiversity Areas of Vanuatu (USP 2012).

Type and number of sources (score = 1.5)

Two websites and two reports had information directly about this SUMA, but neither provided detailed descriptions. General information on mesophotic reefs was found in 3 peer-reviewed articles. Sources used to describe the attributes of Site NO1: Northwest part of Santo are also relevant here.

Obligations (score = 2)

Corals, fish and invertebrates found on coral reefs are subject to regulations under the Fisheries Management Act 2014, and many are listed under the IUCN Red List of Threatened Species, the Vanuatu International Trade (Flora and Fauna) Act 1962, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Whitetip reefs sharks (*Triaenodon obesus*) are listed as Near Threatened on the IUCN Red List of Threatened Species. Pelagic species that may frequent coral reefs, and those attracted to seamount-like structures, are also subject to those obligations. The Tongoa Wall SUMA includes the Tongoa wall marine tabu/conservation site which is included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for formal protection.

3.2.12.3 SITE TON3: KURUMAMBE



FIGURE 60. SITE TON3: Kurumambe

TABLE 65. SITE TON3: Kurumambe. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Kurumambe	TON3	4.5

Geographic boundaries

16.8382°S 168.5752°E, 16.8697°S 168.561°E

Geographic description (score = 1)

This SUMA includes shallow and deep waters out to approximately 2.5 km from the coast on the northern side of Tongoa Island, north of Kurumambe Village. The northern end of the SUMA is adjacent to the southern underwater caldera in the offshore SUMA Site NO2: East Epi, and contains the deep slope descending from the caldera. It also contains the shallow habitats near the coast and the associated slope.

Justification (score = 1.5)

This SUMA contains shallow coral reef habitats and deep slope habitats, it is distinguished by high geothermal activity occurring both on land and in the sea. Geothermal vents or springs occur on the coastline and continue into shallow water, influencing shallow reef habitats. In the deeper waters, volcanic activity and hydrothermal vents affect marine ecosystems. This interaction between steep depth gradients and geothermal activity have resulted in a highly productive environment valued by local fishers (V. Molisa, pers. comm.). Detailed descriptions exist of the area's geology (Monzier et al. 1994), but little direct information is available about the biophysical values of the SUMA.

Hydrothermal and volcanic activity in this SUMA is likely to have created deep-water environments similar to those of Site NO2: East Epi. As well as pelagic fishes attracted by the SUMA's steep topography (see also Site P5: Devil's Rock), there are likely to be deep-water fish species in the deeper areas (see Site CO3: Eastern Vanuatu canyons). Coral reefs are likely to share attributes described in Site TON2: Lupalea (Tongoa wall).

Type and number of sources (score = 1)

The only source with a direct description of this SUMA was a peer-reviewed geological paper. Attributes of the SUMA must otherwise be inferred from sources reviewed in Site NO2: East Epi, Site CO3: Eastern Vanuatu canyons, Site P5: Devil's Rock and Site TON2: Lupalea (Tongoa wall).

Obligations (score = 1)

Corals, fish and invertebrates found on coral reefs and deep-water species are subject to regulations under the Fisheries Management Act 2014, and many are listed under the IUCN Red List of Threatened Species, the Vanuatu International Trade (Flora and Fauna) Act 1962, CMS and CITES.

3.2.12.4 SITE TON4: LUPALEA - PANITA

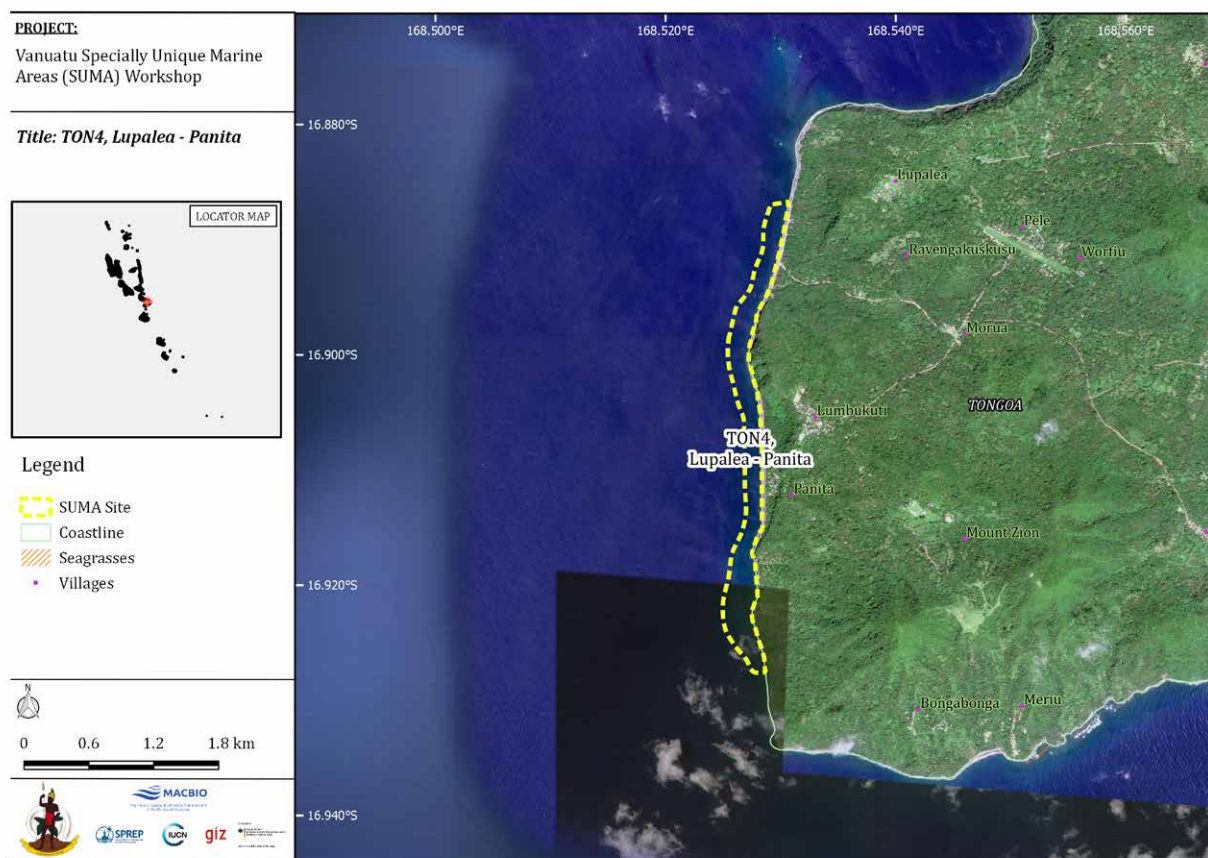


FIGURE 61. SITE TON4: Lupalea - Panita

TABLE 66. SITE TON4: Lupalea - Panita. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Lupalea – Panita	TON4	4.5

Geographic boundaries

16.9274°S 168.524°E, 16.8867°S 168.5307°E

Geographic description (score = 2)

This SUMA is the coral reef on the western side of Tongoa Island, just south of the Tongoa wall SUMA. It encompasses approximately 5 km of coral reef between the villages of Lupalea and Panita.

Justification (score = 1)

The coral reefs in this SUMA are likely to have attributes and species similar to Site TON2: Lupalea (Tongoa wall), due to its proximity and similar wall-like steepness. The reefs here are likely to be subject to strong currents that potentially attract pelagic species due to their complex structure (workshop participants, pers. comm.). Not further direct information was available about this SUMA. General knowledge about coral reefs in Vanuatu were reviewed for Site NO3: Vagtande Island.

Type and number of sources (score = 0.5)

There were no direct sources describing the attributes of this SUMA. Aside from expert knowledge provided by workshop participants, sources used for Site NO3: Vagtande Island and Site TON2: Lupalea (Tongoa wall) are also relevant here.

Obligations (score = 1)

Corals, fish and invertebrates found on coral reefs are subject to regulations under the Fisheries Management Act 2014, and many are listed under the IUCN Red List of Threatened Species, the Vanuatu International Trade (Flora and Fauna) Act 1962, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Pelagic species that may frequent coral reefs, and those attracted to seamount-like structures, are also subject to those obligations.

3.2.13 Inshore: Shefa Province, Emae Island

3.2.13.1 SITE EM1: COOK REEF

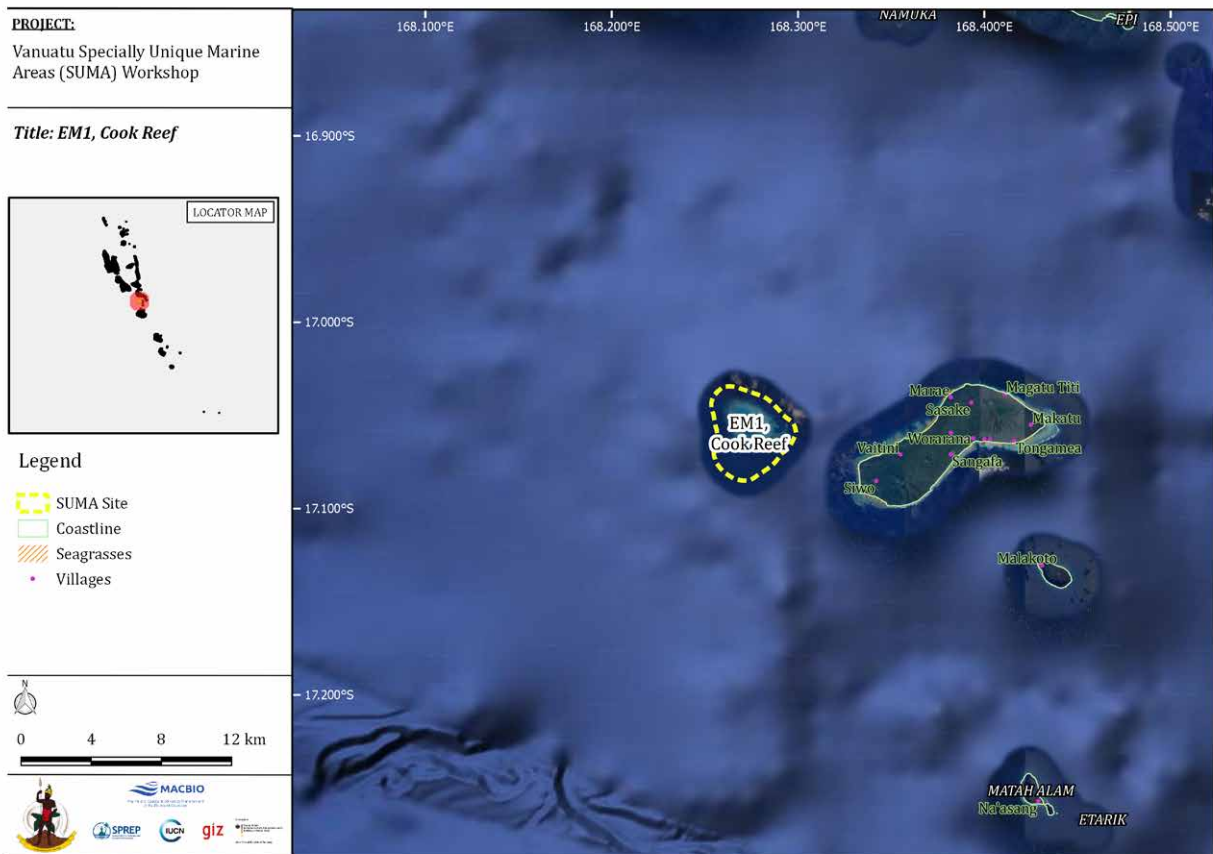


FIGURE 62. SITE EM1: Cook Reef

TABLE 67. SITE EM1: Cook Reef. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Cook Reef	EM1	9

Geographic boundaries

17.0258°S 168.2678°E, 17.0916°S 168.272°E

Geographic description (score = 3)

Cook Reef, located approximately 6 km west of Emae Island, is a large (~ 2.5 by 2 km) platform reef with a lagoon covered in patch reefs and a small opening to the south. The SUMA covers the entire reef and a small stretch of surrounding deep waters.

Justification (score = 2)

Expert workshop participants chose this SUMA because of its high coral reef biodiversity values. The position of this reef in deep waters and its relative distance from human settlements makes it possible that some of its assemblages are relatively intact (see Site NO3: Vagtande Island). Cook Reef has been noted for its complex topography, a variety of reef habitat types, diversity of community zonation across depths (Naviti and Aston 2000), the presence of lobsters (Amos 2007), its high species richness and density of sea cucumbers, which have been heavily exploited elsewhere, and its general productivity (Pakoa et al. 2013). Populations of the tridacnid clams *Tridacna maxima* and *Hippopus hippopus*, overfished in many other areas, were found to be abundant here (Bell and Amos 1993; Amos 2007). Reef fish communities have also been historically rich, especially on the southeastern side, and similar to the Great Barrier Reef (Bell and Amos 1993; Naviti and Aston 2000; Friedman et al. 2008). Deep-water snappers are known to be abundant on the outer slopes of Cook Reef (Blanc 1988; Cillauren et al. 2002), and the reef flats host small patches of seagrass (Chambers et al. 1990).

The references to this reef's high aesthetic value point to a relatively vibrant, intact ecosystem. As reefs around the world become increasingly degraded, such areas become increasingly valuable as repositories of biodiversity and sources of propagules for the recovery of damaged reefs downstream. Further information about Vanuatu's coral reefs can be found in Site NO3: Vagtande Island.

Type and number of sources (score = 3)

Nine reports provided information directly about this SUMA, although in many cases information was repeated across multiple sources. Further sources with useful information, reviewed for Site NO3: Vagtande Island are also relevant here.

Obligations (score = 1)

Corals, fish and invertebrates found on coral reefs are subject to regulations under the Fisheries Management Act 2014, and many are listed under the IUCN Red List of Threatened Species, the Vanuatu International Trade (Flora and Fauna) Act 1962, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The Cook Reef SUMA includes the Cook Reef marine tabu/conservation site, which is included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for formal protection.



3.2.13.2 SITE EM2: SULUA VAITINI SIWO

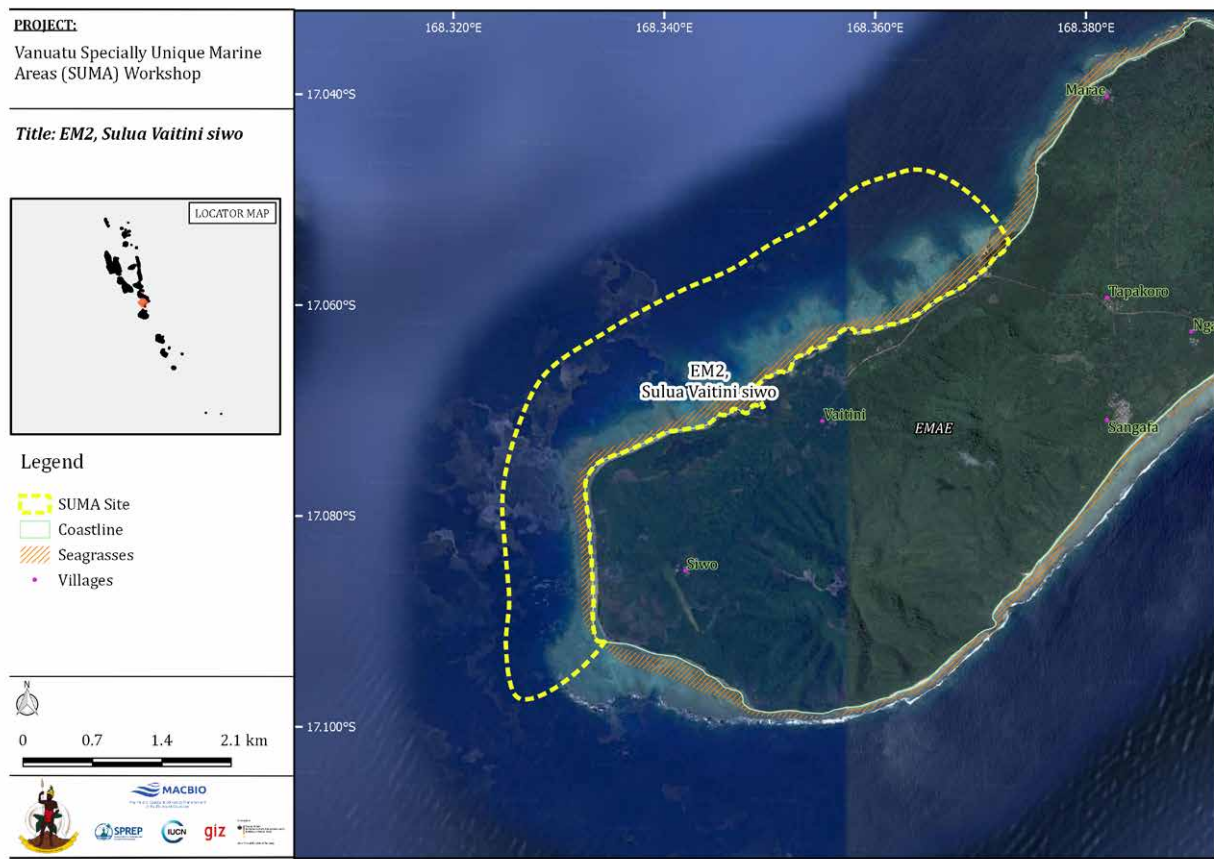


FIGURE 63. SITE EM2: Sulua Vaitini Siwo

TABLE 68. SITE EM2: Sulua Vaitini Siwo. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Sulua Vaitini Siwo	EM2	9.5

Geographic boundaries

17.083°S 168.312°E, 17.0538°S 168.3734°E

Geographic description (score = 2)

Emae Island is part of the Shepherd Islands in the Shefa Province of Vanuatu. This SUMA includes the marine environment of the island's southwestern side. It extends approximately 6.5 km along the coast and 1.5 km out to sea.

Justification (score = 2.5)

This SUMA includes coral reefs, mangroves and seagrass beds in close proximity, and provides habitat for turtles, dugongs and fishes. It is also reported to be a fish spawning site.

37,500 ha of coral reefs surround Emae Island (Naviti 2005). Coral reefs around Emae Island are considered highly productive, both for invertebrates and finfish (Pakoa et al. 2013). A COTS survey in 2014 recorded medium to low numbers of COTS; this SUMA in particular appeared to be free of COTS (Dumas et al. 2014), suggesting that the reefs around southern Emae island may have escaped the damage from larger outbreaks recorded elsewhere in the Province (Johnson et al. 2017). Green snails, sea cucumbers and trochus are considered plentiful (Government of Vanuatu 2016).

Emae Island has 70 hectares of mangroves; almost all is contained within this SUMA (Kalfatak and Jaensch 2014). The mangrove habitat in this SUMA is especially important for the rare sandfish, *Holothuria scabra* (Pakoa et al. 2013). No direct information exists on Emae's seagrass beds.

Dugongs have been recorded in this SUMA, and may move between Emae and Cook Reef (Chambers et al. 1989). The waters surrounding the whole island are known to be high priority dugong habitat (VESS 2017). Few turtles have been recorded foraging around Emae Island in general (Siota 2015), but the island's beaches are considered important for nesting green and hawksbill turtles (Bell and Amos 1993; Amos 2007). For general information about the status and value of the attributes of this SUMA in Vanuatu, see Site NO3: Vagtande Island, Site T4: Linua, Site Q1: Quanlap and Site T8: Reef Islands.

Reef fishes breed by spawning, or releasing gametes into the water for external fertilization; most species form aggregations to maximize the likelihood of success (Russell et al. 2014). Individuals often travel long distances to a particular site to spawn in high densities. This critical event can involve multiple species, and occurs in conjunction with certain phases of the moon or tidal cycles, to further maximize the likelihood of fertilization (Domeier and Colin 1997). Spawning aggregations are both essential for the future of fish populations and especially vulnerable to fishing, as the high density is an artificial and temporary phenomenon that aggregates individuals from a wide area. Targeting them for fishing rapidly depletes fish populations from a broad catchment (Abesamis et al. 2014). On the other hand, protecting multi-species spawning aggregation sites can help protect spawning stocks of many species (Russell et al. 2014). In Vanuatu, spawning aggregations are evidently valued for fishing (Russell et al. 2014), which would make this SUMA of high significance, but there is no information on their exact location.

Type and number of sources (score = 2)

Four reports referred to the SUMA directly, six additional reports described the SUMA's attributes more generally for Emae Island, and one report referred to the province. To highlight the importance of spawning or breeding sites for reef fishes, three general peer-reviewed papers and reports were consulted, and one report that made mention of spawning aggregations in Vanuatu. The general sources used to describe attributes of Site NO3: Vagtande Island, Site T4: Linua, Site Q1: Quanlap and Site T8: Reef Islands are also relevant here.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with coral reefs, seagrass beds and mangroves within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. The sandfish, *Holothuria scabra*, is listed as Endangered on the IUCN Red List of Threatened Species. Trochus is subject to size and quota restrictions. Turtles, dugongs and a large number of fishes and invertebrates associated with coral reefs, seagrass beds and mangroves are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles and dugongs are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Sulua Vaitini Siwo SUMA includes the Vaitini marine tabu/conservation site, which is included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for formal protection.

3.2.13.3 SITE EM3: MAKATEA TO SAGAVA

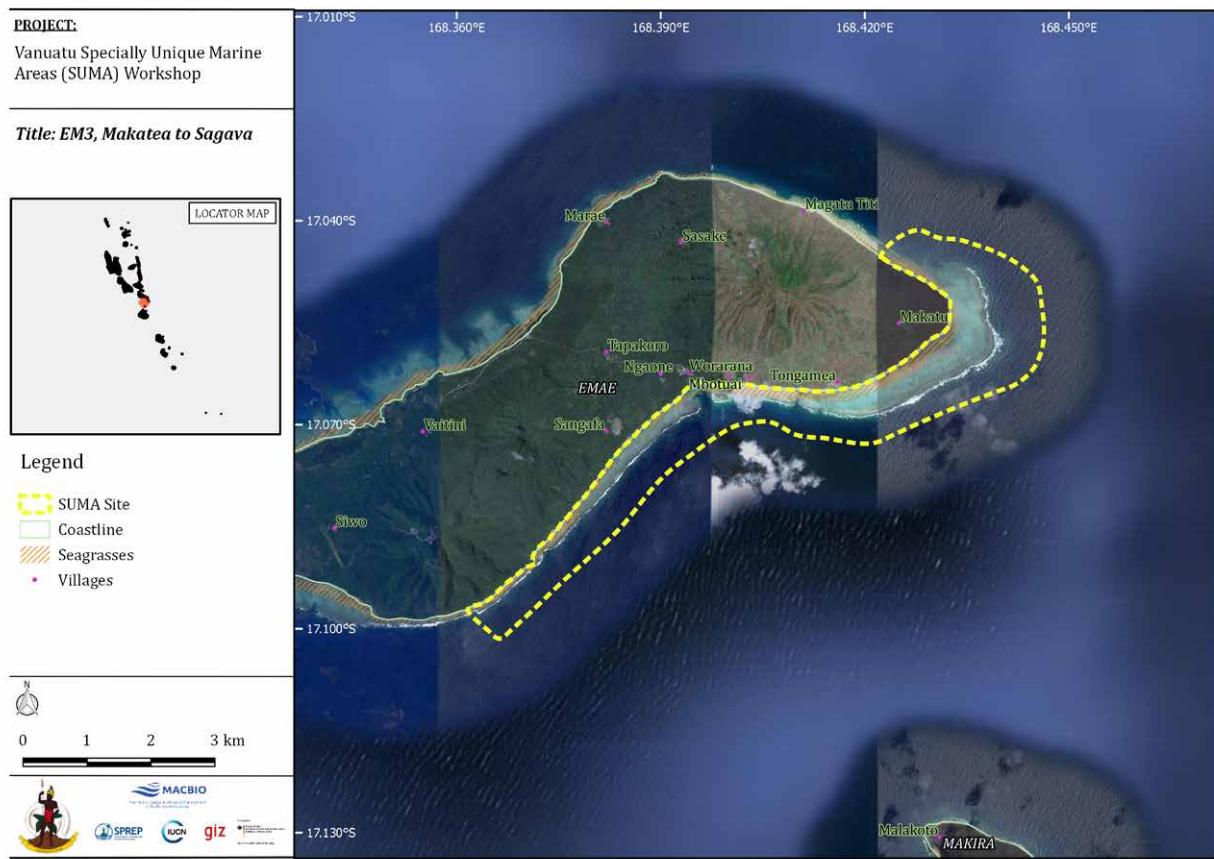


FIGURE 64. SITE EM3: Makatea to Sagava

TABLE 69. SITE EM3: Makatea to Sagava. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Makatea to Sagava	EM3	8

Geographic boundaries

17.0783°S 168.3522°E, 17.0599°S 168.4507°E

Geographic description (score = 2)

This SUMA encompasses half of the northeastern coast and all of the eastern coastline on Emae Island, covering approximately 11 km of the coast and extending between 1 and 1.5 km out to sea to include the fringing coral reef.

Justification (score = 1.5)

Experts present at the workshop identified this area as having the longest beach in Vanuatu, a coral reef in good condition with seagrass beds and a lagoon, abundant sea cucumbers, shellfish and finfishes, turtles and dugongs.

Surveys of sea cucumbers in this SUMA have reported high densities of some species (e.g. *Holothuria atra*), but low densities of commercially important species (Pakoa et al. 2013). Green snails and trochus are considered plentiful (Government of Vanuatu 2016). There are records of foraging green and hawksbill turtles from this SUMA (Siota 2015). Makatea lagoon was the site of a COTS survey and subsequent efforts to eradicate them (Dumas et al. 2014), indicating that stewardship within this SUMA already exists and actions are being taken to maintain or restore the health of the coral reefs. The waters surrounding the whole island are known to be high priority dugong habitat (VESS 2017). Marine ecosystems and the species they support are considered to be in good condition around Emae Island, and the connectivity between the different habitats (coral reef, lagoon, seagrass) is known to enhance their diversity, productivity and resilience (see Site S1: Palekula to Turtle Bay and Site EM2: Sulua Vaitini Siwo).

Type and number of sources (score = 1.5)

Five reports referred directly to attributes of the SUMA, but with little detailed information. Sources and information about these habitats and species around Emae Island and Vanuatu can be found, respectively, in Site NO3: Vagtande Island, Site T4: Linua, Site Q1: Quanlap, Site EM2: Sulua Vaitini Siwo and Site S1: Palekula to Turtle Bay.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with coral reefs and seagrass beds within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Trochus is subject to size and quota restrictions. Turtles, dugongs and a large number of fishes and invertebrates associated with coral reefs and seagrass beds are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles and dugongs are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Makatea to Sagava SUMA includes the Tongomea and Makatea marine tabu/conservation site, which is included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for formal protection.

3.2.13.4 SITE EM4: MARAE TO SAUMA

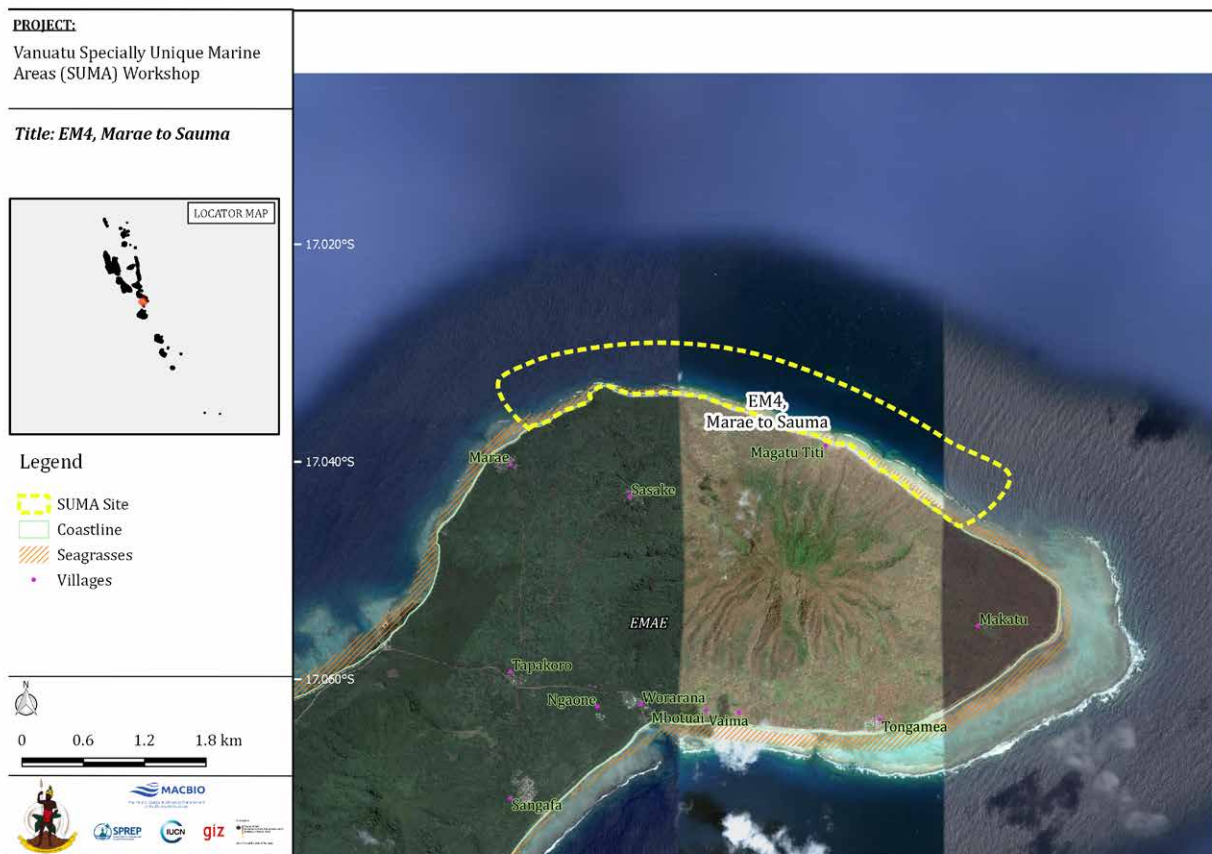


FIGURE 65. SITE EM4: Marae to Sauma

TABLE 70. SITE EM4: Marae to Sauma. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Marae to Sauma	EM4	8

Geographic boundaries

17.0251°S 168.3826°E, 17.0467°S 168.4268°E

Geographic description (score = 2)

Marae and Sauma are villages on the north coast of Emae Island. The coastline alternates between sandy beach and large stone boulders. The SUMA includes approximately 4 km of coastline and extends just under 1 km out to sea.

Justification (score = 1.5)

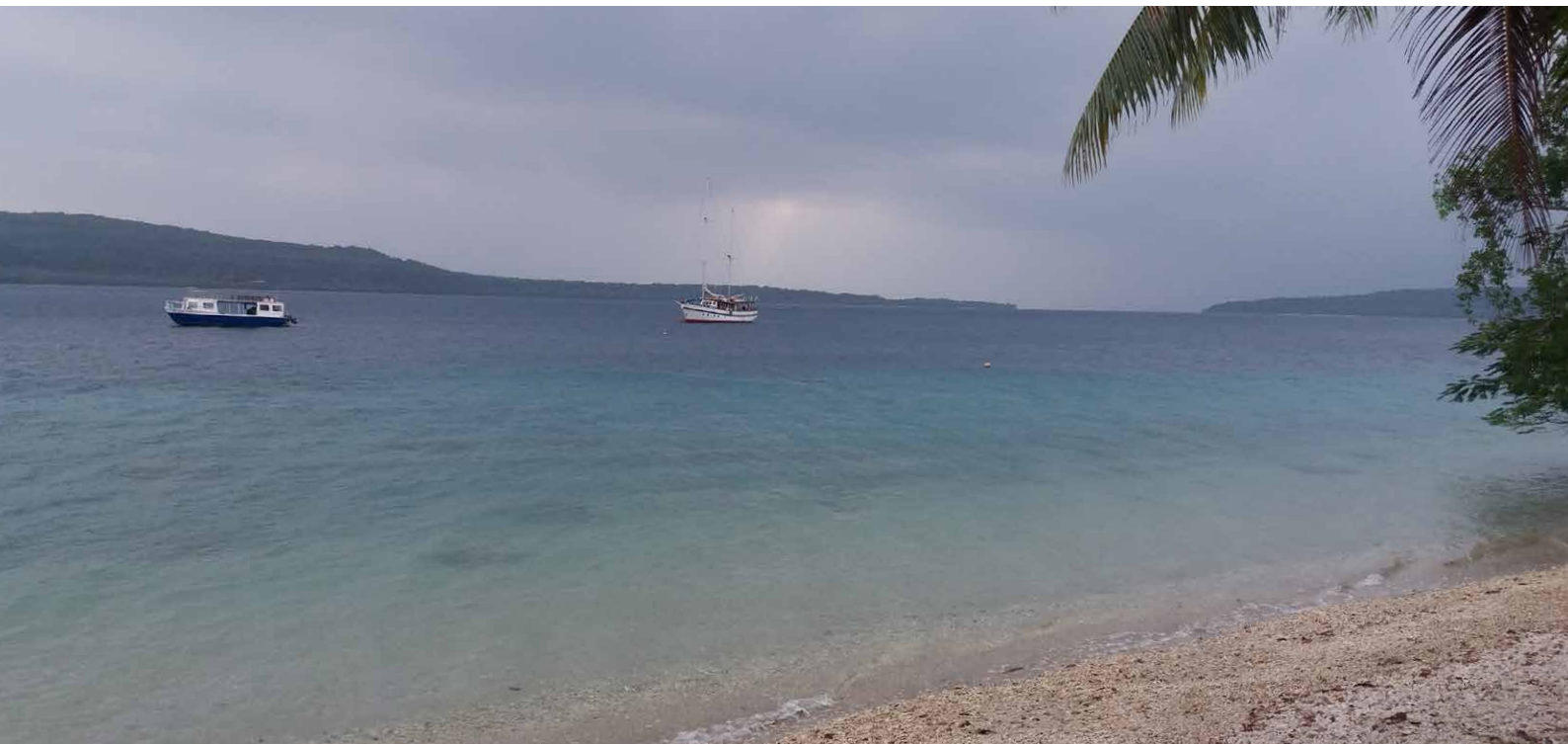
This SUMA includes beach and rocky intertidal habitats, fringing coral reefs and some seagrass habitat. Much like marine habitats surrounding the whole island, this area hosts high biodiversity and productivity, and provides food and resting areas for turtles and dugongs. This SUMA is also known for hosting a high abundance of coconut crabs and black crabs (see Site T1: Metoma Island). Surveys of sea cucumbers in this SUMA have reported medium densities of some species, but low densities of commercially important species (Pakoa et al. 2013). Green snails and trochus are considered plentiful (Government of Vanuatu 2016). The waters surrounding the whole island are known to be high priority dugong habitat (VESS 2017). Marine ecosystems and the species they support are considered to be in good condition around Emae Island, and the connectivity between the different habitats (coral reef, seagrass) is known to enhance their diversity, productivity and resilience (see Site S1: Palekula to Turtle Bay and Site EM2: Sulua Vaitini Siwo).

Type and number of sources (score = 1.5)

Four reports referred directly to attributes of the SUMA, but with little detailed information. Sources and information about these habitats and species around Emae Island and Vanuatu can be found, respectively, in Site NO3: Vagtande Island, Site EM2: Sulua Vaitini Siwo, Site T4: Linua, Site Q1: Quanlap, Site S1: Palekula to Turtle Bay, and Site T1: Metoma Island.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with coral reefs and seagrass beds within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Trochus is subject to size and quota restrictions, and the coconut crab catch is regulated under the Vanuatu National Coconut Crab Fishery Management Plan. Turtles, dugongs and a large number of fishes and invertebrates associated with coral reefs and seagrass beds are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles and dugongs are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Marae to Sauma SUMA includes the Marae marine tabu/conservation site, which is included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for formal protection.



3.2.13.5 SITE EM5: SIWO TO MBALEATONG

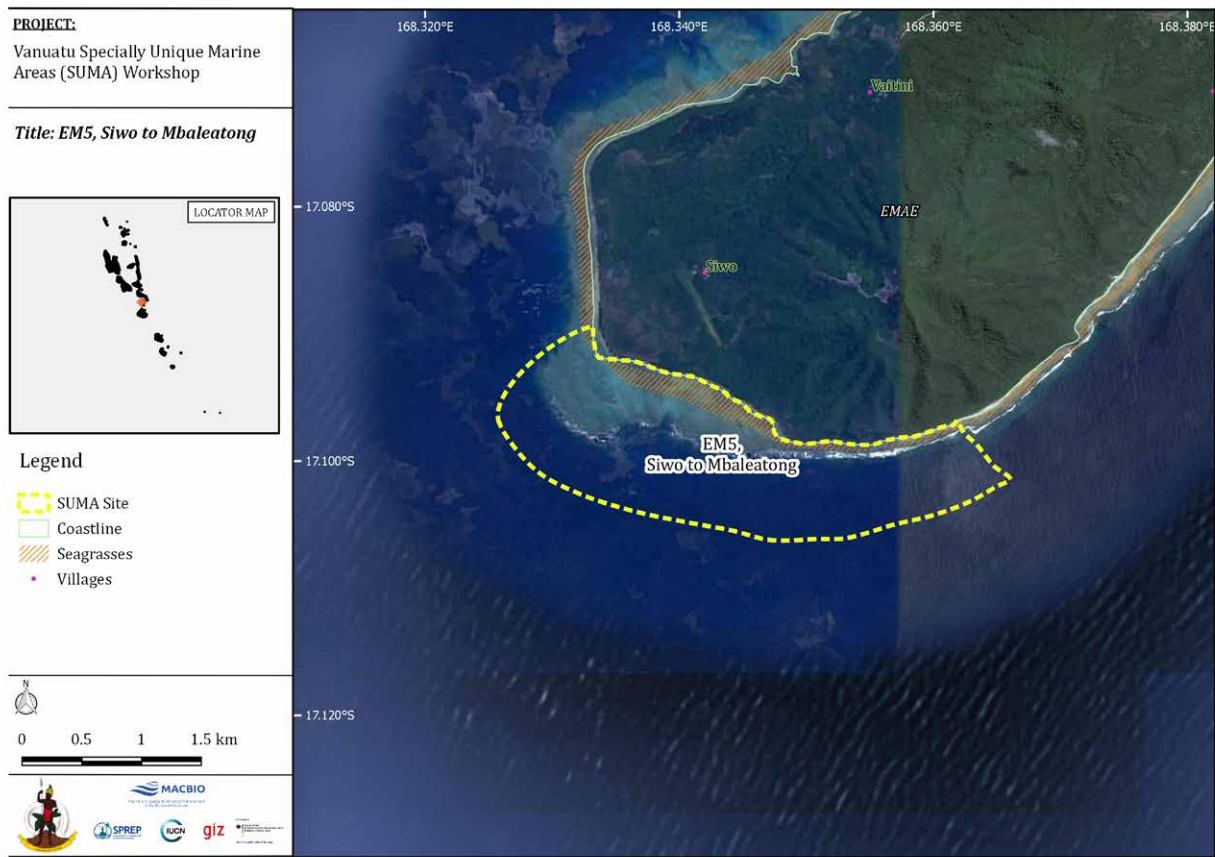


FIGURE 66. SITE EM5: Siwo to Mbaleatong

TABLE 71. SITE EM5: Siwo to Mbaleatong. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Siwo to Mbaleatong	EM5	9

Geographic boundaries

17.088°S 168.3278°E, 17.111°S 168.3636°E

Geographic description (score = 2)

Siwo and Mbaleatong are villages on the southern coast of Emae Island. The coastline alternates between sandy beach and large stone boulders. The SUMA includes approximately 3.5 km of coastline and extends just over 1 km out to sea.

Justification (score = 2)

This SUMA includes coral reefs and seagrass beds in close proximity, and provides habitat for turtles, dugongs and fishes. It includes beach and rocky intertidal habitats.

A COTS survey in 2014 recorded medium to low numbers of COTs; this side of Emae Island in particular appeared to be free of COTs (Dumas et al. 2014), suggesting that the reefs around southern Emae island may have escaped the damage from larger outbreaks recorded elsewhere in the Province (Johnson et al. 2017). This SUMA is also known for hosting a high abundance of coconut crabs and black crabs (see Site T1: Metoma Island).

Dugongs have been recorded in southern Emae, and may move between Emae and Cook Reef (Chambers et al. 1989). The waters surrounding the whole island are known to be high priority dugong habitat (VESS 2017). Few turtles have

been recorded foraging around Emae Island in general (Siota 2015), but the island's beaches are considered important for nesting green and hawksbill turtles (Bell and Amos 1993; Amos 2007). Marine ecosystems and the species they support are considered to be in good condition around Emae Island, and the connectivity between the different habitats (coral reef, seagrass) is known to enhance their diversity, productivity and resilience (see Site S1: Palekula to Turtle Bay and Site EM2: Sulua Vaitini Siwo).

Type and number of sources (score = 2)

Three reports referred to this area directly, six additional reports described the SUMA's attributes more generally for Emae Island, and one report referred to the province. Sources and information about these habitats and species around Emae Island and Vanuatu can be found, respectively, in Site NO3: Vagtande Island, Site Q1: Quanlap, Site EM2: Sulua Vaitini Siwo, Site S1: Palekula to Turtle Bay and Site T1: Metoma Island.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with coral reefs and seagrass beds within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Coconut crabs are provided for under the Vanuatu National Coconut Crab Fishery Management Plan. Turtles, dugongs and a large number of fishes and invertebrates associated with coral reefs and seagrass beds are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles and dugongs are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles.

3.2.14 Inshore: Shefa Province, Makira Island

3.2.14.1 SITE EM6: NAWORALAM

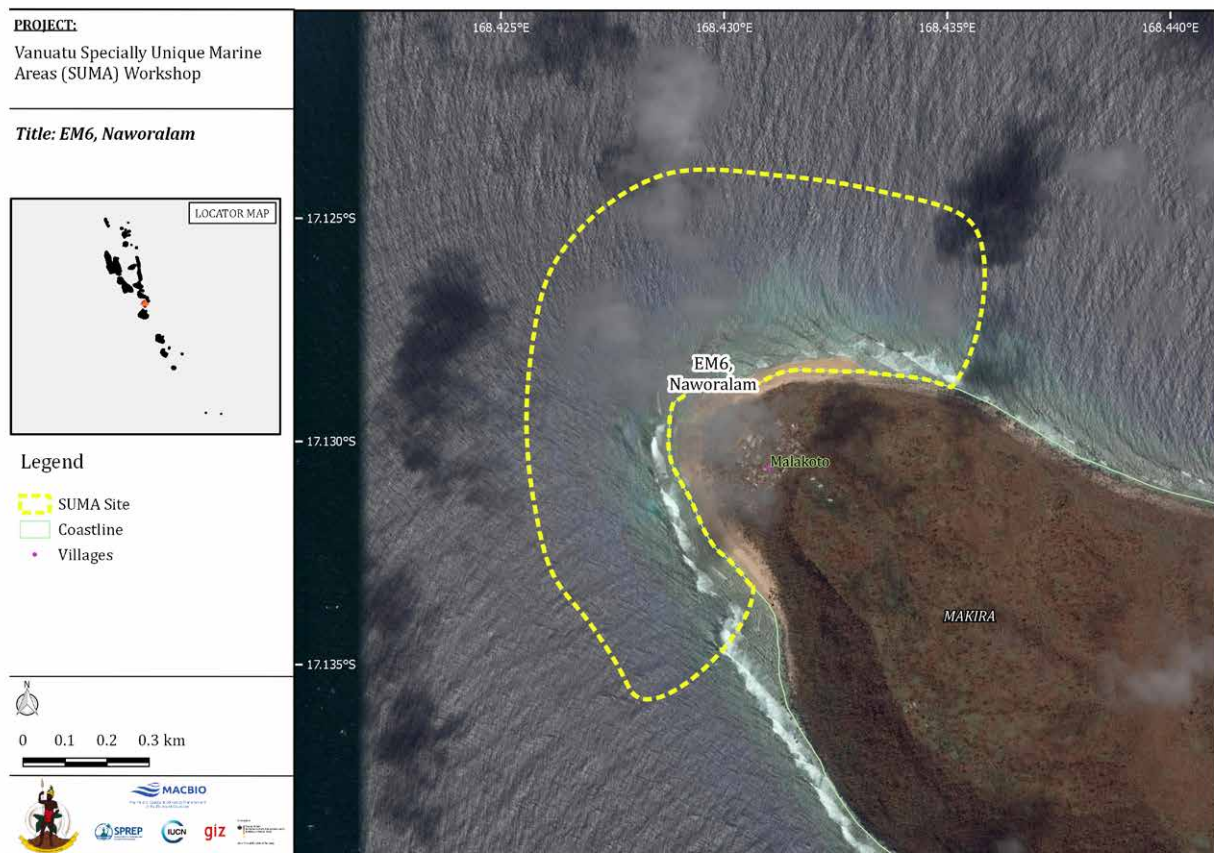


FIGURE 67. SITE EM6: Naworalam

TABLE 72. SITE EM6: Naworalam. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Naworalam	EM6	7

Geographic boundaries

17.1306°S 168.4221°E, 17.1265°S 168.4371°E

Geographic description (score = 2)

Naworalam is located around the northern tip of Makira Island, where a beach and fringing reef wrap around the point of the island. The SUMA includes a little of 1 km of this coastline and extends approximately 400 m out to sea.

Justification (score = 1)

The sandy beach at the northern end of Makira Island was identified by workshop participants as a favourable habitat for land crabs, and a nesting site for turtles (V. Molisa, pers. comm.). No information was available about turtles in this area other than expertise provided by workshop participants. General knowledge about turtles in Vanuatu was reviewed for Site Q1: Quanlap.

The SUMA also includes a stretch of fringing coral reef and seagrasses associated with the reef flat. The coral reefs around Makira Island have high abundances of lobsters (Amos 2007), which have been depleted in other areas; this suggests that populations of other coral reef species may also be healthy in this area. No other information was available to describe coral reefs and seagrasses in this area, but these habitats in the Shefa Province have been described in Site EP1: Lamén and Rovo Bays.

Type and number of sources (score = 1)

One fisheries report indicated a high density of lobsters on Makira Island generally. No further sources were found to justify this SUMA, other than the expert knowledge of workshop participants and sources reviewed for Site Q1: Quanlap and Site EP1: Lamén and Rovo Bays.

Obligations (score = 3)

There are obligations to protect and sustainably manage marine turtles, and species associated with coral reefs and seagrass beds, within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Turtles and many fishes and invertebrates associated with coral reefs and seagrass beds are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles.

3.2.14.2 SITE EM7: SOUTHEASTERN COAST OF MAKIRA



FIGURE 68. SITE EM7: Southeastern coast of Makira

TABLE 73. SITE EM7: Southeastern coast of Makira. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Southeastern coast of Makira	EM7	7

Geographic boundaries

17.143°S 168.4322°E, 17.1348°S 168.4572°E

Geographic description (score = 2)

This SUMA encompasses the southern half of Makira Island, which is oriented in a southeasterly direction. The coastline is characterised by a rocky shoreline and large boulders, and the SUMA extends approximately 400 m out to sea.

Justification (score = 1)

Workshop participants identified this SUMA as favourable habitat for coconut crabs and other large crabs. No information was available about crabs in this area other than expertise provided by workshop participants. Information about coconut crabs in general, and in Vanuatu, was reviewed in Site T1: Metoma Island.

The SUMA also includes a stretch of fringing coral reef and seagrasses associated with the reef flat. The coral reefs around Makira Island have high abundances of lobsters (Amos 2007), which have been depleted in other areas; this suggests that populations of other coral reef species may also be healthy in this area. No other information was available to describe coral reefs and seagrasses in this area, but these habitats in the Shefa Province have been described in Site EP1: Lamen and Rovo Bays. The sandy beach is thought to be a turtle nesting area, but no further information is available about turtles on Makira Island. General knowledge about turtles in Vanuatu was reviewed for Site Q1: Quanlap.

Type and number of sources (score = 1)

One fisheries report indicated a high density of lobsters on Makira Island generally. No further sources were found to justify this SUMA, other than the expert knowledge of workshop participants and sources reviewed for Site T1: Metoma Island, Site Q1: Quanlap and Site EP1: Lamem and Rovo Bays.

Obligations (score = 3)

There are obligations to protect and sustainably manage marine turtles, and species associated with coral reefs and seagrass beds, within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Turtles and many fishes and invertebrates associated with coral reefs and seagrass beds are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. Coconut crabs are provided for under the Vanuatu National Coconut Crab Fishery Management Plan, the Fisheries Management Act 2014, and are listed under the IUCN Red List of Threatened Species.

3.2.15 Inshore: Shefa Province, Mataso Island

3.2.15.1 SITE MT1: MONUMENT ROCK

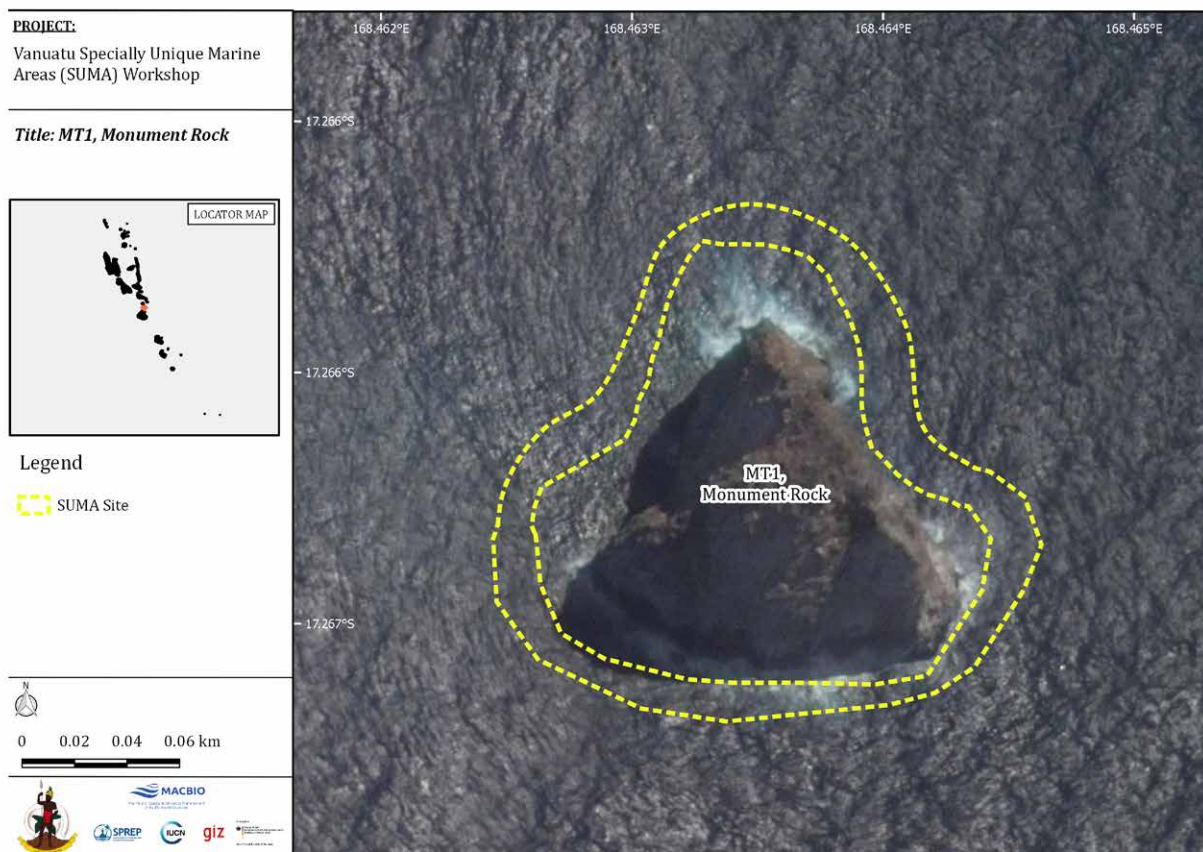


FIGURE 69. SITE MT1: Monument Rock

TABLE 74. SITE MT1: Monument Rock. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Monument Rock	MT1	8.5

Geographic boundaries

17.2673°S 168.4622°E, 17.2667°S 168.4647°E

Geographic description (score = 3)

Monument Rock is a roughly triangular monolith, measuring 130 by 130 m, jutting out of deep water approximately 2.6 km southeast of Mataso Island. Its rocky sides rise steeply out of the ocean and low vegetation covers the upper reaches. The SUMA covers the rock itself to high water mark and the marine habitats immediately surrounding it.

Justification (score = 2)

The shallow slope of Monument Rock is fringed with coral reef, and deeper waters just beyond attract deepwater and pelagic fishes. The island itself provides a nesting ground for seabirds.

The area between Efate and Emae Islands, which includes this SUMA, has historically been known to host high densities of deepwater fishes (Cillauren et al. 2002; Vanuatu Fisheries Department 2016). Site CO3: Eastern Vanuatu canyons contains more information about deep-water fish species present in Vanuatu. One website mentions the popularity of Monument Rock for sportfishing (Ocean Blue Fishing 2018). These sources suggest that the rock functions much like a seamount in attracting aggregations of pelagic and deepwater predators (see Site NO1: Northwest part of Santo).

Seabirds are known to nest on exposed open ocean islands with access to pelagic foraging grounds (see Site NO3: Vagtande Island). Very little direct information exists on seabird nesting sites throughout Vanuatu, but brown boobies are known to nest in this SUMA (Dutson 2011).

Type and number of sources (score = 1.5)

Two reports, a website and a book contain a reference to Monument Rock in relation to its special, unique attributes. Apart from expert sources at the workshop, very little information exists about this SUMA. Sources used to describe seamounts and seabirds in Vanuatu more generally can be found at Site NO1: Northwest part of Santo, Site NO3: Vagtande Island and Site CO3: Eastern Vanuatu canyons.

Obligations (score = 2)

Corals, fish and invertebrates found on coral reefs are subject to regulations under the Fisheries Management Act 2014, and many are listed under the IUCN Red List of Threatened Species, the Vanuatu International Trade (Flora and Fauna) Act 1962, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Many of Vanuatu's seabirds are also listed under the acts above. Vanuatu also has a National Plan of Action (NPOA) to reduce incidental catches of seabirds in longline fisheries. Birds are further protected under Vanuatu's Wild Bird (Protection) Act Cap 30, but this applies mostly to land-based birds. The Monument Rock SUMA includes the Monument Rock marine tabu/conservation site, which is included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for formal protection.

3.2.15.2 SITE MT2: SIWO



FIGURE 70. SITE MT2: Siwo

TABLE 75. SITE MT2: Siwo. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Siwo	MT2	6.5

Geographic boundaries

17.2496°S 168.4153°E, 17.2444°S 168.4215°E

Geographic description (score = 2)

Mataso Island lies approximately halfway between Efate and Emae Islands. Siwo is a white sand beach on the northwestern coast of Mataso, between the steep cliff face and a broad coral reef flat. The SUMA includes 700 m of beach and extends 300 m out to sea, slightly beyond the reef edge.

Justification (score = 1.5)

Experts present at the workshop identified this SUMA as a turtle nesting site and for its coral reef habitat. No further turtle nesting information was found for this area. Coral survey data from 2006–2007 showed relatively high coral cover (~30%) in Mataso (Raubani 2009; Chin et al. 2011), with a high abundance of lobsters and a re-stocked population of trochus (Amos 2007). For further information about turtles and coral reefs in Vanuatu and nearby Emae Island, see Site NO3: Vagtande Island, Site Q1: Quanlap and Site EM2: Sulua Vaitini Siwo.

Type and number of sources (score = 1)

Three reports made mention of coral reefs on Mataso Island, but did not provide detail. Sources and information about these habitats and species around nearby Emae Island and Vanuatu can be found, respectively, in Site NO3: Vagtande

Island, Site Q1: Quanlap and Site EM2: Sulua Vaitini Siwo.

Obligations (score = 2)

There are obligations to protect and sustainably manage species associated with coral reefs within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Trochus is subject to size and quota restrictions. Turtles and a large number of fishes and invertebrates associated with coral reefs are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Siwo SUMA includes Mataso marine tabu/conservation sites, which are included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for formal protection.

3.2.15.3 SITE MT3: MATASO



FIGURE 71. SITE MT3: Mataso

TABLE 76. SITE MT3: Mataso. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Mataso	MT3	6.5

Geographic boundaries

17.2513°S 168.4248°E, 17.2664°S 168.4378°E

Geographic description (score = 1)

Mataso Island lies approximately halfway between Efate and Emae Islands. This SUMA includes the beach and coral reefs at the southern end of the island, and the beach and reefs around the small island just to the south, Matah Susum, attached to Mataso by an isthmus.

Justification (score = 2)

This beach at the southern end of Mataso is an important turtle nesting beach identified by expert workshop participants. No further information was available on turtles nesting on Mataso Island or in the SUMA.

Coral reefs within the SUMA are highly exposed to the prevailing wind and waves. Past surveys have reported coral cover on Mataso Island's reefs to be over 30%, which is among the higher values for Vanuatu (Wilkinson 2008; Chin et al. 2011). Species that have declined elsewhere due to exploitation are abundant here, such as lobsters (Amos 2007), suggesting a highly productive reef. Mataso Island's reefs were also re-seeded with trochus in the past (Amos 2007); healthy trochus populations contribute to grazing on highly exposed coral reef crests, helping to maintain coral dominance. For general information on coral reefs and turtles in Vanuatu, see Site NO3: Vagtande Island and Site Q1: Quanlap.

Type and number of sources (score = 1.5)

Workshop participants provided the only source for turtles in this SUMA, but coral cover was reported in two sources, further coral reef species were mentioned in one report. For more general information, sources used for Site NO3: Vagtande Island and Site Q1: Quanlap also apply.

Obligations (score = 2)

There are obligations to protect and sustainably manage species associated with coral reefs within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Trochus is subject to size and quota restrictions. Turtles and a large number of fishes and invertebrates associated with coral reefs are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Mataso SUMA includes Mataso marine tabu/conservation sites, which are included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for formal protection.

3.2.16 Inshore: Shefa Province, Efate Island

3.2.16.1 SITE EF1: NORTH MOSO

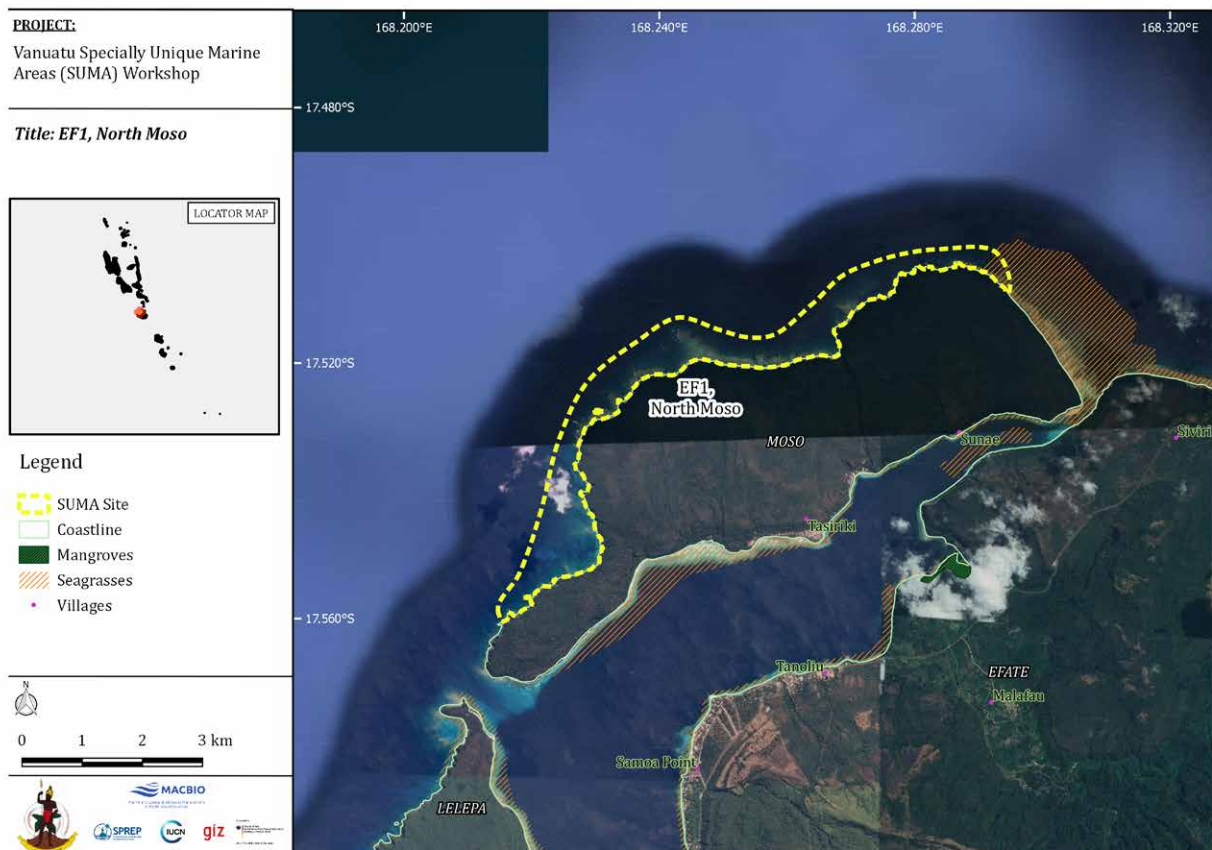


FIGURE 72. SITE EF1: North Moso

TABLE 77. SITE EF1: North Moso. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	North Moso	EF1	7

Geographic boundaries

17.5395°S 168.2015°E, 17.508°S 168.2965°E

Geographic description (score = 3)

Efate Island is the third largest island in Vanuatu, with a land area of 980 km². This SUMA includes the northern coastline and associated fringing reefs of the island of Moso, a small island located off the northwest coast of Efate Island. Moso Island is separated from Efate by Namoso Passage, which is 200 m wide at its narrowest point. The SUMA includes approximately 12 km of inshore marine habitat, and extends around 800 m out to sea.

Justification (score = 1)

This SUMA was identified by workshop participants as an important hawksbill turtle nesting site. In fact, this area is both a hawksbill turtle rookery and a “turtle sanctuary”, where a hawksbill turtle conservation program is run by a local resort (Tranquillity Island Resort 2018). It is unclear how many turtle nests are located in the SUMA, but tagged turtles are released each year (Siota 2015). The conservation program represents a unique opportunity for interactions between humans and these critically endangered species for the benefit of the turtles (Island Life 2015). The north Efate area has been recognised for its biodiversity and is included as one of the Key Biodiversity Areas of Vanuatu (USP 2012). For general information about Vanuatu’s sea turtles, see Site Q1: Quanlap.

Type and number of sources (score = 2)

Two websites and two reports were used as direct sources of information for this SUMA. General information about Vanuatu’s sea turtles used to describe Site Q1: Quanlap also applies here.

Obligations (score = 1)

There are obligations to protect turtles in Vanuatu under the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014, and Vanuatu has a National Plan of Action (NPOA) for all sea turtles. Hawksbill turtles are listed as Critically Endangered on the IUCN Red List of Threatened Species, and are also listed under CITES. The North Moso SUMA includes Moso marine tabu/conservation sites, which are included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for informal protection.

3.2.16.2 SITE EF2: TUKUTUK

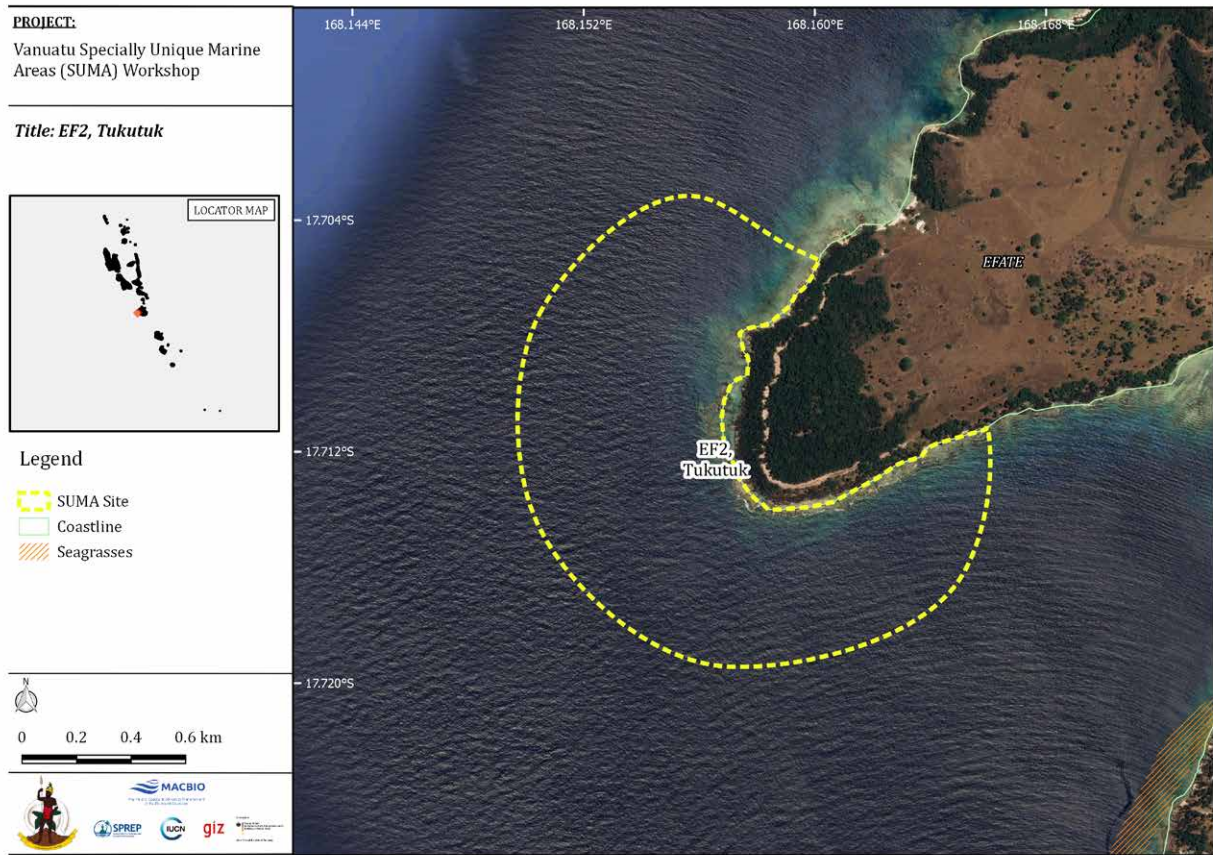


FIGURE 73. SITE EF2: Tukutuk

TABLE 78. SITE EF2: Tukutuk. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Tukutuk	EF2	5

Geographic boundaries

17.7012°S 168.156°E, 17.7231°S 168.1584°E

Geographic description (score = 2)

This SUMA includes a large headland jutting out from the western coast of Efate Island. The headland is split into a smaller and a larger headland, with a small bay (Tukutuk Bay) dividing them. Tukutuk Bay is the larger of the two bays found at the tip of the headland (with Tukutuk being considered the general name for the whole area). Stretches of white sandy beaches lie between the two bays.

Justification (score = 1)

This SUMA was identified by workshop participants as an important hawksbill turtle nesting site. Nesting hawksbill turtles have been recorded from the SUMA since 1995, but it is unclear how many nests are in the area. Turtle tagging has also taken place in this area (Siota 2015). Marine resource survey found wild populations of green snails around Tuku Tuku Point, which lies within this SUMA (Terashima et al. 2018); as these are rare elsewhere in Vanuatu, their presence here suggests that marine exploitation is relatively low, or that any customary protection measures have been beneficial to the marine environment. No further information was found directly about this SUMA, but see Site Q1: Quanlap for general information about Vanuatu's sea turtles.

Type and number of sources (score = 1)

Two reports were used as direct sources of information for this SUMA. General information about Vanuatu’s sea turtles used to describe Site Q1: Quanlap also applies here.

Obligations (score = 1)

There are obligations to protect turtles in Vanuatu under the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014, and Vanuatu has a National Plan of Action (NPOA) for all sea turtles. Hawksbill turtles are listed as Critically Endangered on the IUCN Red List of Threatened Species, and are also listed under CITES.

3.2.16.3 SITE EF3: KAKULA

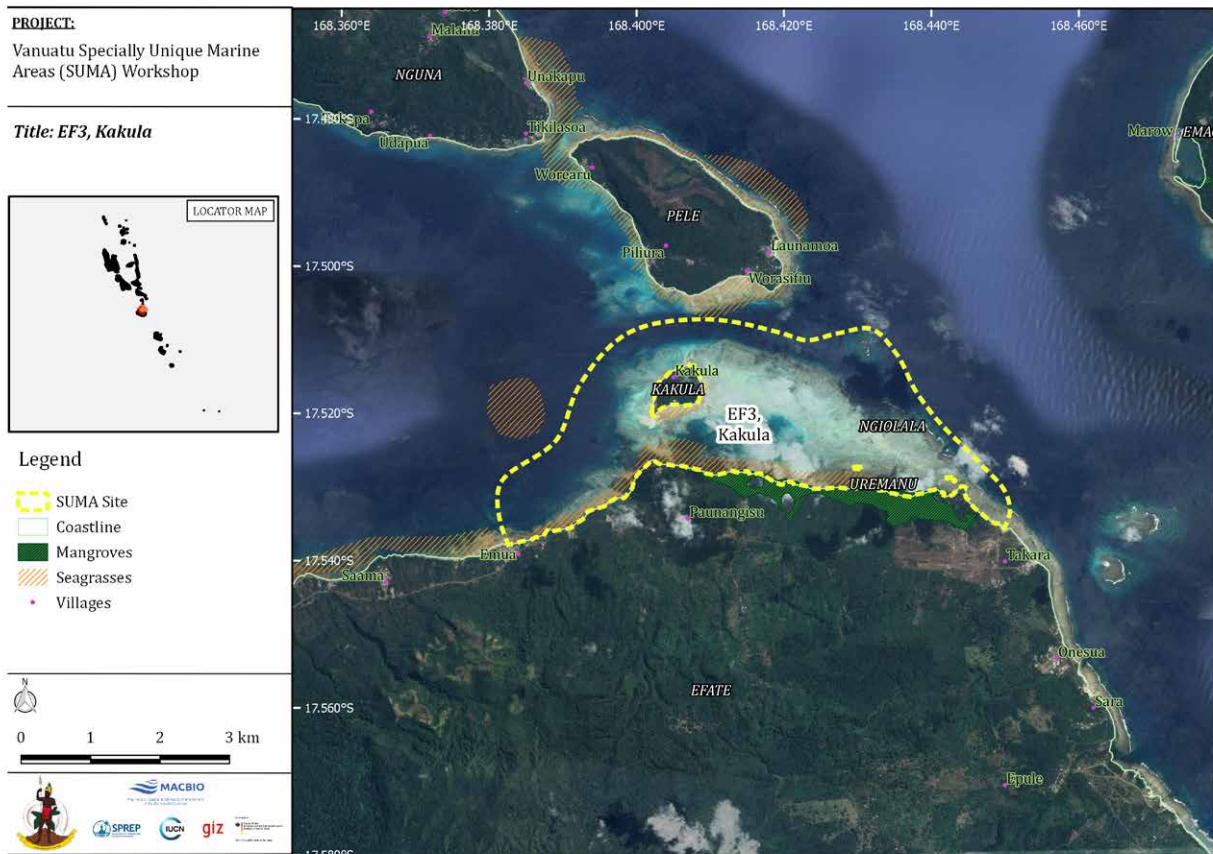


FIGURE 74. SITE EF3: Kakula

TABLE 79. SITE EF3: Kakula. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Kakula	EF3	12

Geographic boundaries

17.5081°S 168.3803°E, 17.5356°S 168.4508°E

Geographic description (score = 3)

Kakula is a small island off the northern end of Efate Island, connected to Efate Island by an extensive reef flat. The SUMA includes the entire stretch of reef, from north Efate around Kakula, and shallow waters to the west of Kakula Island, covering ~ 10 km².

Justification (score = 3)

This SUMA has a large reef system including mangroves, seagrass beds, reef areas and shallow lagoons (Pakoa et al. 2013); the proximity of these diverse habitats within a small area is likely to promote high productivity (see Site S1: Palekula to Turtle Bay). Fine-scale habitat maps exist for the area in the SUMA, showing an intricate mosaic of algal beds, seagrass meadows, live coral, dead coral, broken branching coral, sand, rubble, and rock (old eroded coral substrate). The reef flat has both subtidal and intertidal areas, further adding to the complexity of the overall habitat (Léopold et al. 2017). A large proportion of Efate's mangroves is within this SUMA; there are 82 km² of mangroves between Paunangisu and Takara, 0.9 km² near Emua and 4 km² near Lakenasua (Johnson et al. 2016).

Coral reefs in this SUMA were targeted in a COTS eradication program (Government of Vanuatu 2016), potentially reducing pressure on the coral reefs locally and providing a source of coral recruitment to other reefs around Efate Island that have been affected by COTS. The earliest coral reef surveys in north Efate, conducted in 1989 after Tropical Cyclone Bola, recorded an average coral cover of 20.5% on north-west reefs (Done and Navin 1990). In 2004, coral cover in north Efate had recovered to 60–75% (Hill 2004), and surveys in 2006–2007 recorded average hard coral cover of 49% across 11 sites in north Efate (Raubani 2009), representing the highest coral cover of all reefs surveyed in Vanuatu at that time (Chin et al. 2011; Johnson et al. 2016). The latest survey estimated coral cover to be ~22% across north Efate (Johnson et al. 2016). Other coral reef organisms in Efate, especially food fishes and invertebrates, vary between low numbers where indiscriminate fishing occurs, and higher numbers in remote and protected areas (Hill 2004; Nimoho et al. 2013). Even though sea cucumber populations are depleted in this area, and individuals tend to be small, the coral reef supports ten sea cucumber species, including the rare sandfish *Holothuria scabra* (Pakoa et al. 2013). Evidence of past and recent coral recovery in north Efate suggests that these coral reefs are resilient to disturbance (Chin et al. 2011).

Workshop participants also highlighted the presence of finfish, turtles and dugongs in this SUMA. Finfish surveys at two sites within the SUMA noted a high biomass of surgeonfishes, but otherwise showed signs of overfishing (Welch 2016); in the past, finfish catches were high, suggesting a naturally productive habitat (Friedman et al. 2008). Turtles were recorded nesting and foraging near Emua Village, at the western end of the SUMA, including olive ridley, green and hawksbill turtles (Siota 2015). Dugongs have also been recorded in this area, and it is considered a high priority habitat for them (Chambers et al. 1989; VESS 2017).

A community marine reserve has been planned for the area between the western tip of Kakula Island and the northern coast of Efate Island (Léopold et al. 2017). This SUMA is included in the “North Efate” Key Biodiversity Area (USP 2012). For more general knowledge about relevant habitats and species in Vanuatu, see Site NO3: Vagtande Island, Site T4: Linua, Site Q1: Quanlap, Site T8: Reef Islands and Site S1: Palekula to Turtle Bay.

Type and number of sources (score = 3)

There was a large amount of information directly relevant to this SUMA: 12 reports and one peer-reviewed paper held some information about species and habitats. More general information about Efate's coral reefs was found in three reports. General sources about relevant habitats and species used in Site NO3: Vagtande Island, Site T4: Linua, Site Q1: Quanlap, Site T8: Reef Islands and Site S1: Palekula to Turtle Bay are also useful here.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with coral reefs, seagrass beds and mangroves within the Environmental Protection and Conservation Act [CAP 283] and the Forestry Act 2001 [Cap 276]. Turtles, dugongs and a large number of fishes and invertebrates associated with coral reefs, seagrass beds and mangroves are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles and dugongs are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Kakula SUMA includes the Paunganisu marine tabu/conservation site, which is included in the NBSAP (2018–2030) as an existing marine conservation site.

3.2.16.4 SITE EF4: MAROU LAGOON ON EMAU ISLAND

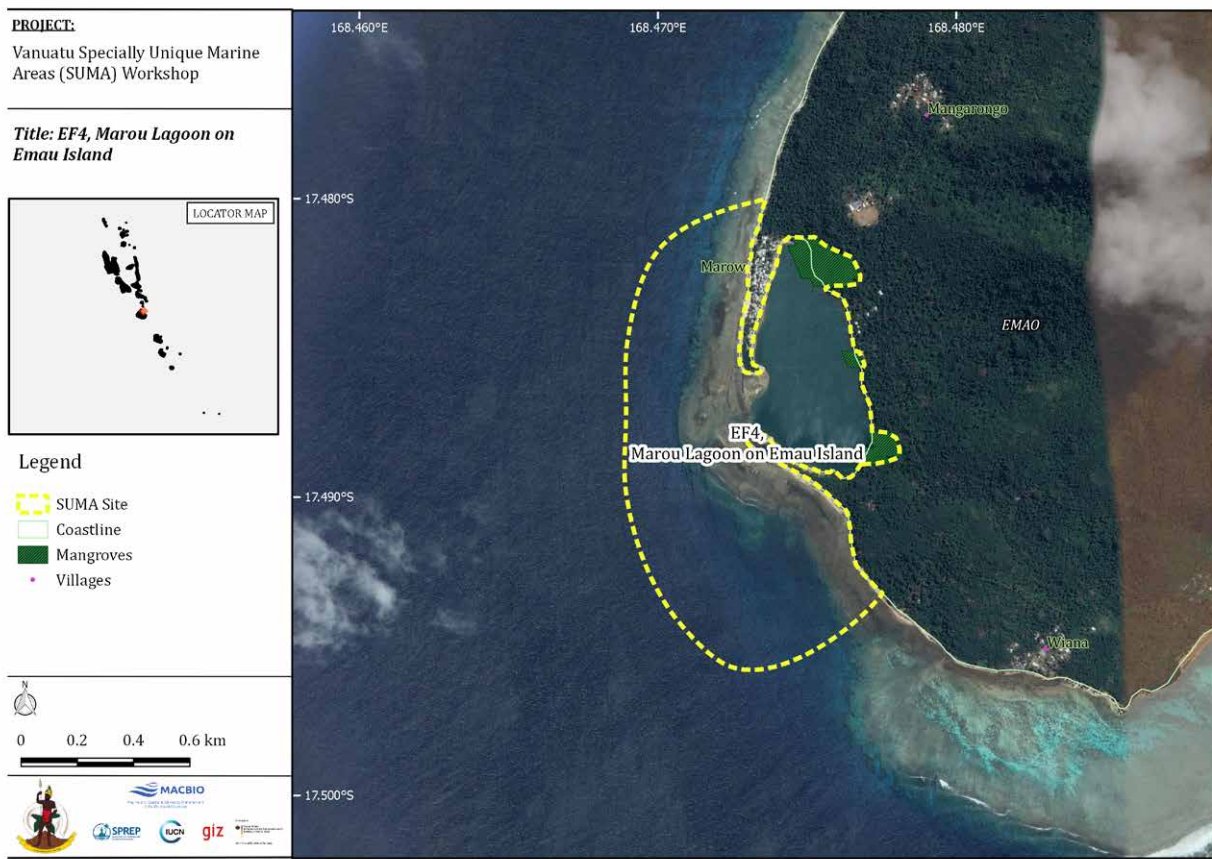


FIGURE 75. SITE EF4: Marou Lagoon on Emau Island

TABLE 80. SITE EF4: Marou Lagoon on Emau Island. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Marou Lagoon on Emau Island	EF4	10

Geographic boundaries

17.4795°S 168.4761°E, 17.4965°S 168.4704°E

Geographic description (score = 3)

Marou (or “Marow”, as shown on most maps) Lagoon is a semi-enclosed lagoon on the western side of Emau (or “Emao”) Island, which is located 5 km off the northeastern coast of Efate Island. The lagoon is roughly 800 by 300 m in dimension. The SUMA includes the waters of the lagoon and the fringing reef and coastal habitats immediately outside the lagoon.

Justification (score = 2)

Despite the small size of this lagoon and the adjacent fringing coral reefs, the workshop participants selected it for its diversity of mangrove, seagrass and coral reef habitats and as a habitat for dugongs, mud crabs, mangrove oysters, nesting and foraging grounds for turtles and a nursery area for fish. The north Efate area has been recognised for its biodiversity and is included as one of the Key Biodiversity Areas of Vanuatu (USP 2012). Marou Lagoon itself is a traditional tabu area (Johnson et al. 2016), and this has led to an increase in the normally-harvested invertebrates such as trochus and clams inside the lagoon (Dumas et al. 2012).

Coral reefs appear to be in good condition around Emao Island, with just under 15% coral cover and less than 5% algae cover at the time of the last survey; this was relatively healthy compared with areas nearby, where macroalgae dominated (Johnson et al. 2016). COTS affected Emao's reefs in the past, but during warm periods, bleaching was lower on these reefs than on other reefs nearby (Johnson et al. 2016). A finfish survey of the coral reef within the SUMA showed a dominance of surgeonfishes, followed by goatfishes, parrotfishes and butterflyfishes (Welch 2016). For general knowledge about coral reef in the north Efate area, see Site EF3: Kakula.

No other direct information was available for this SUMA. For more information about coral reefs, mangroves, seagrass beds and the abovementioned species in Vanuatu, see Site NO3: Vagtande Island, Site T4: Linua, Site Q1: Quanlap, Site T8: Reef Islands and Site S1: Palekula to Turtle Bay. Mangroves and sheltered lagoons are well known to function as nursery grounds for a number of species (Barbier et al. 2011; Olds et al. 2013). Coral reefs that are able to resist disturbance, or that can recover after disturbances, become valuable as sources of larvae for nearby damaged reefs (see Site NO3: Vagtande Island and Site EF3: Kakula).

Type and number of sources (score = 2)

Two reports presented information collected directly at the site, one report about the north Efate area was relevant to Emao Island, and two peer-reviewed papers provided additional knowledge about the key ecosystems at the site. General information relevant to the attributes of this SUMA was reviewed in Site NO3: Vagtande Island, Site T4: Linua, Site Q1: Quanlap, Site T8: Reef Islands, Site S1: Palekula to Turtle Bay and Site EF3: Kakula.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with coral reefs, seagrass beds and mangroves within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. Turtles, dugongs and a large number of fishes and invertebrates associated with coral reefs, seagrass beds and mangroves are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles and dugongs are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Marou Lagoon on Emao Island SUMA includes the Marou Lagoon marine tabu/conservation sites, which are included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for informal protection.

3.2.16.5 SITE EF5: EMAU ISLAND (EAST)

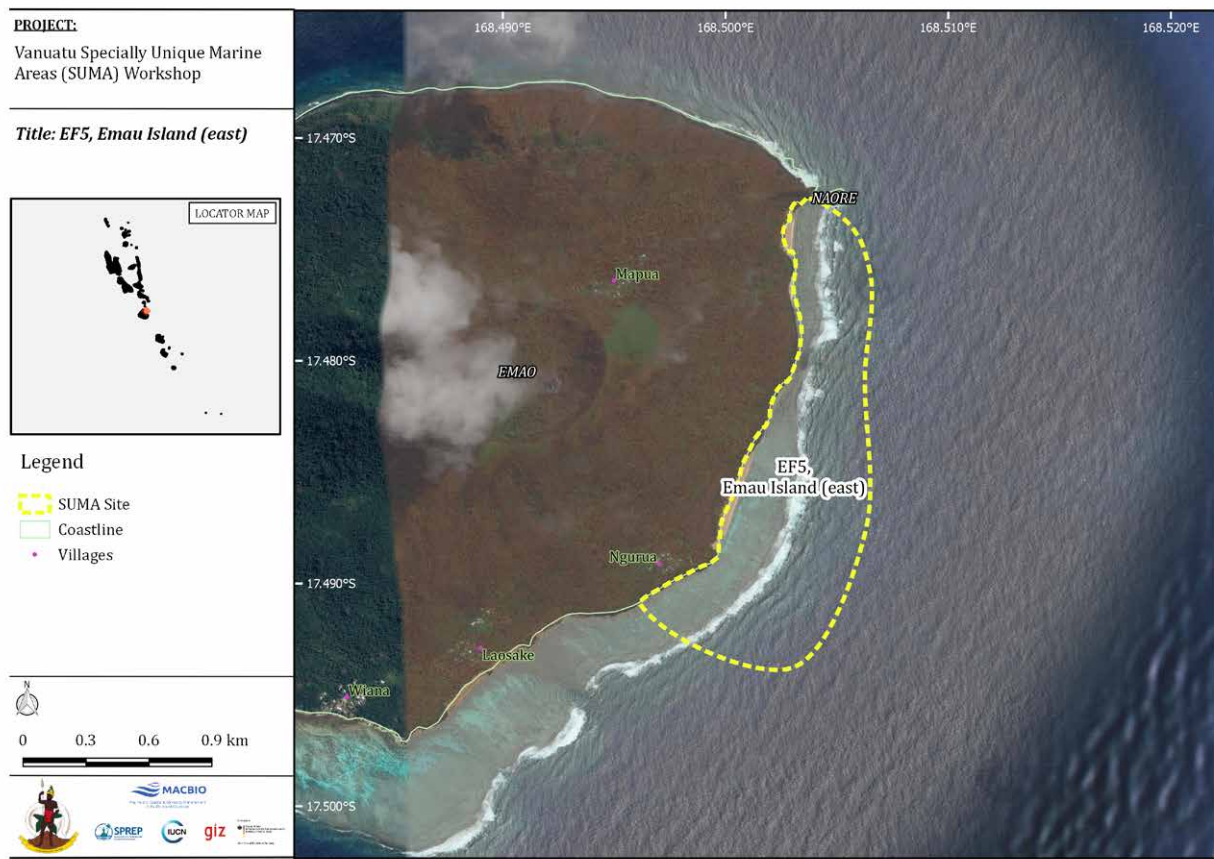


FIGURE 76. SITE EF5: Emau Island (east)

TABLE 81. SITE EF5: Emau Island (east). Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Emau Island (east)	EF5	5

Geographic boundaries

17.4918°S 168.4958°E, 17.4755°S 168.5111°E

Geographic description (score = 2)

Emau (or “Emao”) Island is located 5 km off the northeastern coast of Efate Island; it is a small, roughly circular island measuring approximately 3 km in diameter. This SUMA is a small stretch of beach and fringing reef on the eastern side of the island, including around 2 km of coastline and extending approximately 500 m out to sea.

Justification (score = 1)

Expert workshop participants identified this SUMA as being a turtle nesting site. Turtles are known to nest throughout the northern part of Efate Island and associated islands; green and hawksbill turtles are regularly reported from around Emau Island (Siota 2015). The north Efate area has been recognised for its biodiversity and is included as one of the Key Biodiversity Areas of Vanuatu (USP 2012). No direct data exist on nesting turtles at this site, but the habitat appears favourable. For further information about turtles in Vanuatu, see Site Q1: Quanlap.

Type and number of sources (score = 1)

One report mentioned the presence of foraging turtles in the general area of Emau Island, and one report includes it in one of Vanuatu’s Key Biodiversity Areas. For other information about nesting turtles in this region, sources used in Site Q1: Quanlap and other SUMAs around Efate Island are also relevant here.

Obligations (score = 1)

There are obligations to protect and sustainably manage turtles within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Green turtles are listed as Endangered, and hawksbill turtles are Critically Endangered, under the IUCN Red List of Threatened Species; both are also listed under CITES. Vanuatu has a National Plan of Action (NPOA) for all sea turtles.

3.2.16.6 SITE EF6: PELE ISLAND (NORTHEAST)

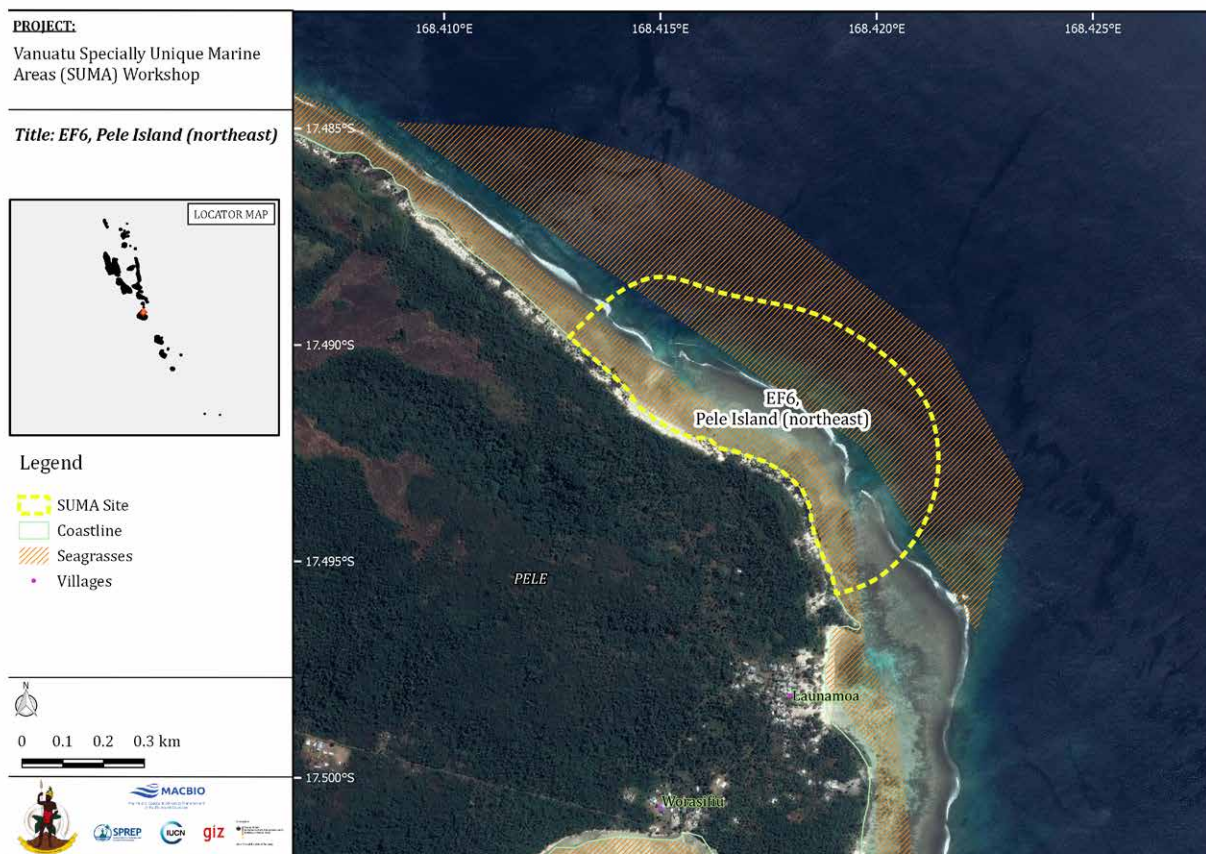


FIGURE 77. SITE EF6: Pele Island (northeast)

TABLE 82. SITE EF6: Pele Island (northeast). Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Pele Island (northeast)	EF6	9

Geographic boundaries

17.4864°S 168.4161°E, 17.4961°S 168.4194°E

Geographic description (score = 2)

Pele Island (or Pélé Island) is a volcanic island 18km north of the island of Efate Island. It has a total area of 29 km² and has a population of 200–220 people residing in four villages. Pele Island is a part of the MPA Nguna-Pele Marine Protected Area network, which covers a total area of 30 km², including numerous reefs, sea grass beds, mangrove forests and intertidal lagoons. The SUMA incorporates a small area of mostly shallow coral reef flat habitat, and measures approximately 600 by 300 m.

Justification (score = 2)

This part of Pele Island hosts coral reefs and shallow seagrass habitats, providing habitat for abundant fish species, turtles and dugongs.

Pele Island is a part of the Nguna-Pele Marine Protected Area (MPA) Network, which was established in 2003 (Government of Vanuatu 2016); the SUMA lies within one of the MPAs that make up the network (Johnson et al. 2016). The Nguna-Pele Marine Protected Area is a small, community-based network on the islands of Nguna and Pele; 16 individual villages on Nguna and Pele manage marine ecosystems within their tenured boundaries. Both permanent and periodic closures have had positive effects on fish biomass inside the reserve (Raubani 2009). This general area of north Efate Island and smaller nearby islands belong to a Key Biodiversity Area (USP 2012).

Coral reefs in the general Nguna-Pele area have low (5%) coral cover and relatively high (25%) algal cover, as they have been heavily affected by COTS and bleaching (Johnson et al. 2016, 2017). However, water quality appeared good (Johnson et al. 2016); together with MPA protection, this indicates a good potential for recovery from disturbances and exploitation. In fact, data and photographs collected in 2004 suggest that reefs in the SUMA itself have been in good condition in the past (Hill 2004).

The protection provided by the MPA has resulted in some of the only records of exploited species in the general area, such as the clam *Tridacna maxima*, the blacklip pearl oyster *Pinctada margaritifera* and several sea cucumber species that have become rare (Friedman et al. 2008). These invertebrates were not sampled directly within the SUMA, but their proximity suggests connectivity between the SUMA and sources of larvae. Recent finfish surveys found very low densities and diversity of finfish at nearby sites on Nguna Island, but did not sample coral reefs on Pele Island (Welch 2016).

Green and hawksbill turtles and dugongs are seen regularly foraging around Pele Island (Chambers et al. 1989; Siota 2015); this SUMA is part of an area designated as high priority for dugongs (VESS 2017). Further information about the attributes of this SUMA in the broader north Efate area, and more generally, can be found at Site NO3: Vagtande Island, Site Q1: Quanlap, Site T8: Reef Islands, Site S1: Palekula to Turtle Bay and Site EF3: Kakula.

Type and number of sources (score = 2)

Two reports include information collected directly within this SUMA. Sources that described the general Nguna-Pele area, including the MPA network, comprised of nine reports. Sources describing the attributes of this SUMA more generally include those used for Site NO3: Vagtande Island, Site Q1: Quanlap, Site T8: Reef Islands, Site S1: Palekula to Turtle Bay and Site EF3: Kakula.

Obligations (score = 3)

Pele Island is a part of the MPA Nguna-Pele Marine Protected Area, which was established in 2003. There are additional obligations to protect and sustainably manage species associated with coral reefs and seagrass beds within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Turtles, dugongs and a large number of fishes and invertebrates associated with coral reefs and seagrass beds are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles and dugongs are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles.

3.2.16.7 SITE EF7: HAVANNAH HARBOUR



FIGURE 78. SITE EF7: Havannah Harbour

TABLE 83. SITE EF7: Havannah Harbour. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Havannah Harbour	EF7	10

Geographic boundaries

17.619°S 168.1722°E, 17.5347°S 168.3128°E

Geographic description (score = 3)

The northern coast of Efate Island faces Moso Island across Namoso Passage, also known as Havannah Harbour. The passage effectively creates a “pseudo-lagoon”. The SUMA encompasses the entire passage, including the western coast of Lelepa Island and extending to the coastal waters off Mangalilu Village.

Justification (score = 2)

The passage between Efate and Moso Islands is fringed with sheltered coral reefs, lined with mangroves and the shallow waters have seagrass beds, which provide foraging grounds for turtles. Tagging studies suggest that hawksbill turtles forage in this area (Siota 2015); it is unclear if other species also use the area, but given the presence of seagrass beds, green turtles may also be present. A deep seafloor separates the two coastlines, with abrupt, wall-like sides (Smith 1991).

Most shallow marine habitats around Efate Island have abundant seagrass beds, but this SUMA includes one of only three areas of mangroves on the island (MESCAL 2013), and the mangroves on Efate Island are considered to be of conservation significance (Government of Vanuatu 2016). There are reported to be 100 ha of mangroves in Efate, overall (Kalfatak and Jaensch 2014). The combination of shelter, some community management, and the proximity of seagrass,

mangrove and coral reef communities makes this a very productive environment (Friedman et al. 2008; Johnson et al. 2016).

Reefs around Lelepa Island and the eastern end of Moso Island were noted for their relatively high coral cover and diversity (Done and Navin 1990; Veron 1990), and low macroalgal cover, suggesting that these fringing reefs are in good condition (Johnson et al. 2016). High biomass of parrotfishes in the Port Havannah area is also an indicator of the presence of important processes that sustain reef health (Welch 2016). A tabu area around Mangaliliu Village, at the eastern edge of the SUMA, has been effective in the recovery of trochus populations (Dumas et al. 2012). North Efate, including this SUMA, is considered a Key Biodiversity Area (USP 2012). Very little descriptive information is available for this SUMA. For general information about mangroves, seagrass beds and marine turtles in Vanuatu, see Site T4: Linua and Site Q1: Quanlap.

Type and number of sources (score = 2)

Ten reports and one peer-reviewed paper mention the existence of the main attributes of this SUMA (mangroves, coral reefs, turtles, seagrass beds), but they contain very little descriptive information that could assist in justifying the site's special, unique values. The values can be inferred with general references from Site T4: Linua and Site Q1: Quanlap.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with seagrass beds and mangroves within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. Turtles and a large number of fishes and invertebrates associated with seagrass beds and mangroves are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Havannah Harbour SUMA includes Moso and Lelepa marine tabu/conservation sites, which are included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for informal and formal protection.

3.2.16.8 SITE EF8: EPAU VILLAGE

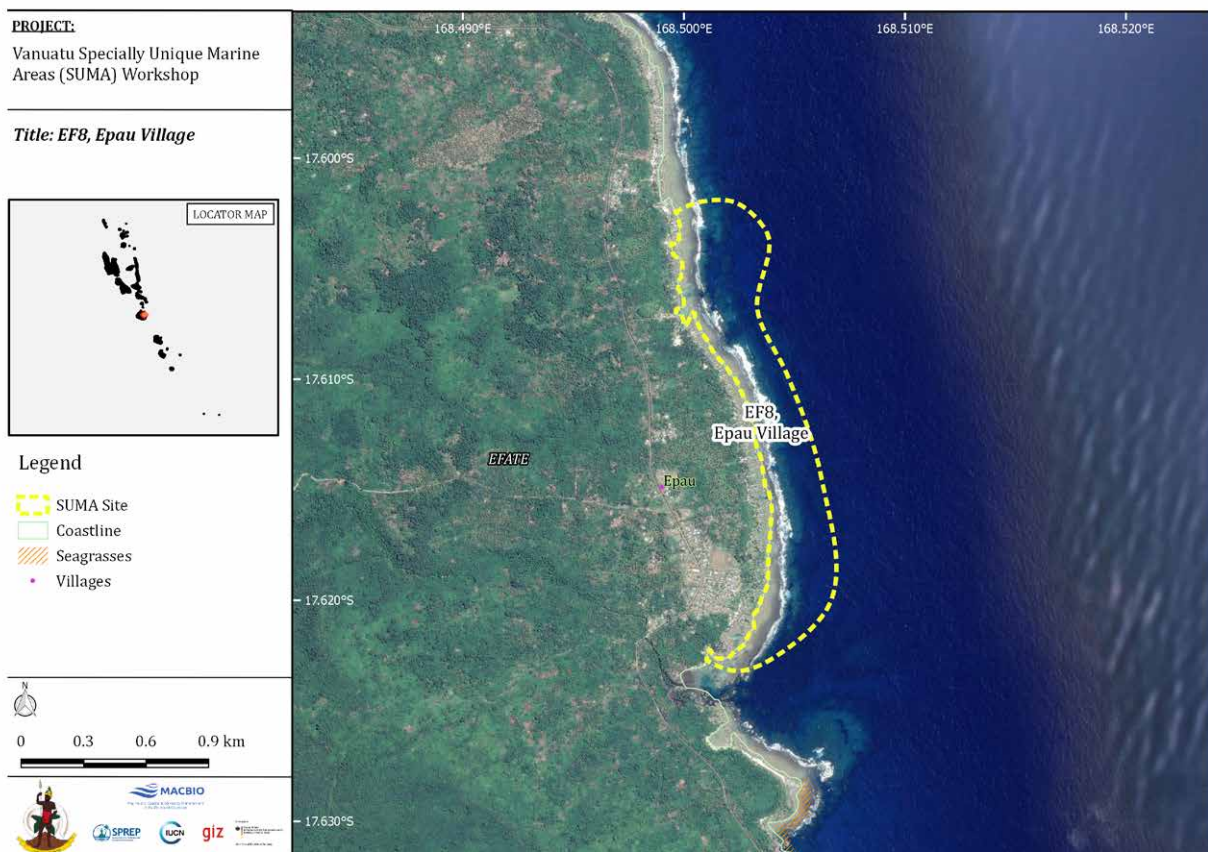


FIGURE 79. SITE EF8: Epau Village

TABLE 84. SITE EF8: Epau Village. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Epau Village	EF8	6

Geographic boundaries

17.6015°S 168.5055°E, 17.6233°S 168.5011°E

Geographic description (score = 2)

Epau Village lies on the exposed east coast of Efate Island, with black sand beaches extending north and south, and a narrow fringing reef just off the coast. The SUMA includes approximately 2 km of coastline and extends 400 m out to sea.

Justification (score = 1.5)

This SUMA was selected for its combination of coral reef and mangrove habitats in close proximity, and for its importance as a hawksbill turtle nesting area; it has been highlighted for protection in the NBSAP (Government of Vanuatu 2016). Nesting green turtles have also been recorded on the beach off Epau Village, and both hawksbill and green turtles have been observed foraging in the area (Siota 2015). No further information is available about the values of this SUMA, but see Site NO3: Vagtande Island, Site T4: Linua, Site Q1: Quanlap and Site EF3: Kakula for general information about relevant habitats and species in Vanuatu and north Efate Island.

Type and number of sources (score = 1.5)

One report mentioned the presence of nesting and foraging turtles in the general area of Epau Village, and the NBSAP suggested its conservation value. For other information about nesting turtles in this region, sources used in Site NO3: Vagtande Island, Site T4: Linua, Site Q1: Quanlap and other SUMAs around Efate Island are also relevant here.

Obligations (score = 1)

There are obligations to protect and sustainably manage turtles within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Green turtles are listed as Endangered, and hawksbill turtles are Critically Endangered, under the IUCN Red List of Threatened Species; both are also listed under CITES. Vanuatu has a National Plan of Action (NPOA) for all turtles. The Epau SUMA includes the Epau marine tabu/conservation site, which is included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for formal protection.

3.2.16.9 SITE EF9: ETON



FIGURE 80. SITE EF9: Eton

TABLE 85. SITE EF9: Eton. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Eton	EF9	7.5

Geographic boundaries

17.7471°S 168.5584°E, 17.7351°S 168.5774°E

Geographic description (score = 2)

This SUMA is located on the eastern side of Efate Island, and is exposed to the prevailing southeasterly trade winds. Therefore, the coastline is rugged, and is fringed by a narrow reef flat. The village of Eton is located on the southern edge of the SUMA. A small river empties into a small cove, which is somewhat sheltered by coral rock at the sides of the white sand beach.

Justification (score = 1.5)

The beaches of this SUMA are thought to host nesting turtles, and the river mouth forms an estuarine environment with mangrove stands and associated biota (V. Molisa, pers. comm.). Among the mangroves, it is thought that endemic species exist, including those with life cycles that span freshwater and marine habitats (Cardno 2017). Additionally, the fringing coral reef flat has patches of seagrass, and the reef slope is thought to support healthy populations of fishes. No further information was found about this SUMA, but general information about turtles and mangroves in Vanuatu is reviewed in Site T4: Linua and Site Q1: Quanlap. Seagrass beds and coral reef communities are likely to be similar to those described in Site EF3: Kakula.

Justification (score = 2)

Workshop participants selected this site for its rich variety of marine habitats (mangroves, seagrass beds, coral reefs) in close proximity, and the presence of species of conservation concern, including turtles and dugongs. This SUMA was the site of a MESCAL project that documented the mangroves in detail. The project mapped 33 ha of mangrove cover, 12 mangrove species and 3 major vegetation types (Baereleo et al. 2013). The area was also identified for its importance as a fish nursery, a source of fish and coastal protection (Kalfatak and Jaensch 2014; Government of Vanuatu 2016). Mean mangrove percent cover for shoreline segments was 79%; forest height was estimated at approximately 5 m, and the fringing forest was mostly of moderate to high biomass (67%), with high structural diversity and habitat type richness. The dominant species was *Rhizophora stylosa* (69%), with *R. apiculata* often present and co-dominant. *Avicennia marina* was present in more marine areas, *Sonneratia alba* was present in isolated stands within the lagoon, and *Ceriops tagal* was observed where the upper inter-tidal zone was near the shoreline edge. Fauna surveys included land-based and coastal marine species, and show the role mangroves play in linking marine and terrestrial communities (Table 87). Further, the Eratap mangroves are home to at least two endemic species (Baereleo et al. 2013). A separate sea cucumber survey found 15 sea cucumber species in south Efate (Ham et al. 2014). A mangrove management plan is proposed for Eratap and Erakor (Government of Vanuatu 2016).

The Eratap mangroves have been disturbed as a result of land clearing, reclamation and the cutting of mangrove trees; they exhibit a poor capacity for recovery from disturbance, though some scattered areas of the mangroves are still in good health (Baereleo et al. 2013). A small area of fringing coral reef is reported to be in good condition (DEPC 2011).

Dugongs are known to occur in Eratap Lagoon (VESS 2017), and they have been protected from hunting in the past (Chambers et al. 1989). No direct information was available on seagrasses or turtles in Eratap, but broader knowledge about these attributes in the general area is presented at Site Q1: Quanlap and Site EF7: Havannah Harbour.

TABLE 87. Mangrove fauna observed in the Eratap SUMA. Baereleo et al. (2013). Asterisks indicate endemic species.

Taxonomic group	Species	Common name
Birds	<i>Chalcophaps indica</i>	Green-winged ground dove
	<i>Halycon chloris</i>	Chestnut kingfisher
	<i>Myzomela cardinalis</i>	Cardinal honeyeater
	<i>Rhipidura fuliginosa</i>	Grey fantail
	<i>Trichoglossus haematodus</i>	Rainbow lorikeet
	<i>Zosterops flavirons*</i>	Vanuatu white-eye
	<i>Zosterops lichemas</i>	Grey-backed honeyeater
Gastropods	<i>Terebralia palustris</i>	Giant mangrove whelk
	<i>Littoria</i> spp.	Periwinkles
	<i>Nerita grayana</i>	Neritid snails
Bivalves	<i>Crassostrea</i> sp.	Oyster
	<i>Gafrarium</i> sp.	Comb venus clam
Crustaceans	<i>Scylla serrata</i>	Mud crab
	<i>Cardiosma carnifex</i>	Land crab
	<i>Thalassina squamifera</i>	Mangrove lobster
	<i>Grapsidae</i> sp.	Marsh crabs
	<i>Gecarcinidae</i> spp.	Land crabs
	<i>Ulca annulipes</i>	Red claw fiddler crab
Reptiles	<i>Emoia sanfordi*</i>	Green tree skink
	<i>Emoia impar</i>	Blue-tailed stripe skink
	<i>Lepidodactylus lugubris</i>	Mourning gecko

Taxonomic group	Species	Common name
Fish	<i>Gobiidae</i> spp.	Mud skippers
	<i>Muraenidae</i> spp.	Moray eels
Echinoderms	<i>Protoreaster</i> sp.	Knobbly sea star
	<i>Opheodesoma</i> sp.	Synaptid sea cucumber
	<i>Holothuria</i> sp.	Tiger tail sea cucumber

Type and number of sources (score = 2.5)

Information about this SUMA was obtained from seven reports about the site, and one report that described south Efate in general. General sources used for Site Q1: Quanlap and Site EF7: Havannah Harbour are also relevant here.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with seagrass beds and mangroves within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. Turtles, dugongs and a large number of fishes and invertebrates associated with seagrass beds and mangroves are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles and dugongs are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Eratap SUMA includes the Eratap marine tabu/conservation sites, which are included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for formal protection.

3.2.1611 SITE EF11: PANGO AND ERAKOR

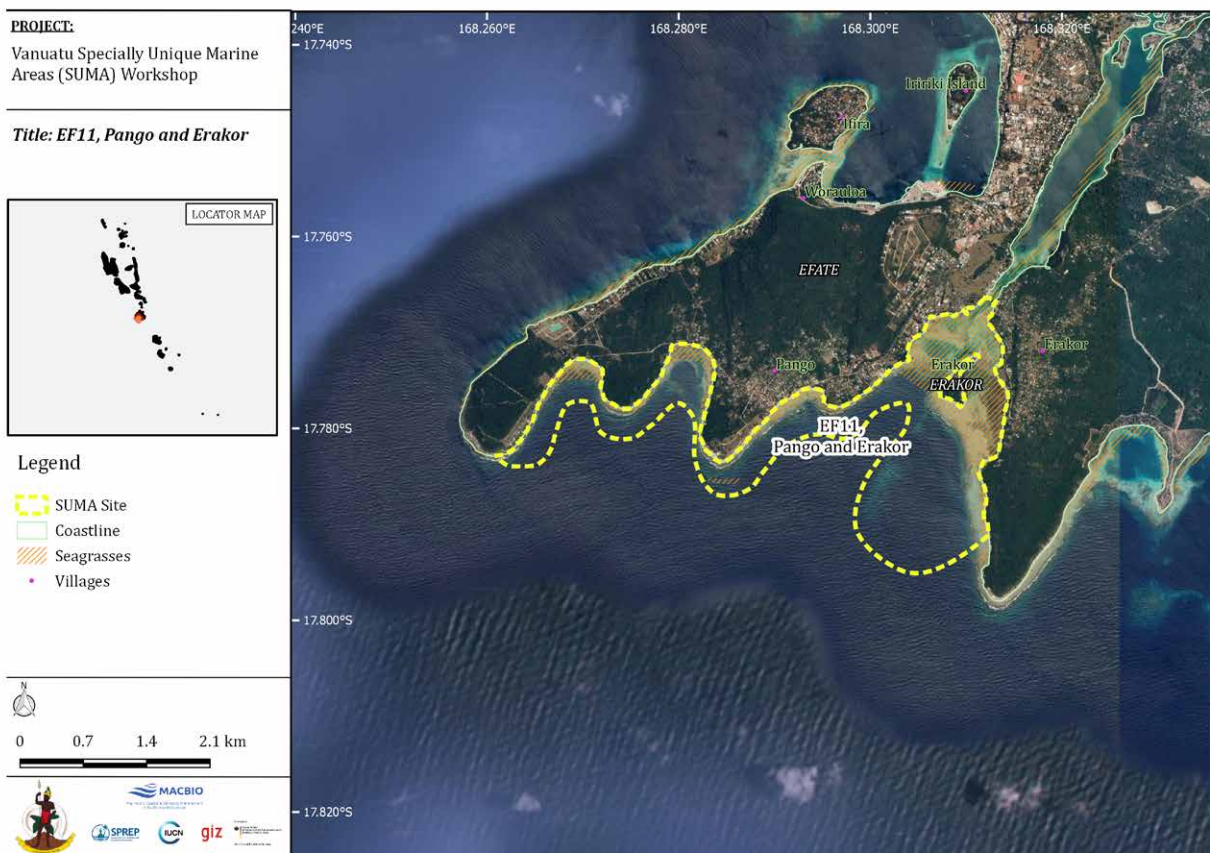


FIGURE 82. SITE EF11: Pango and Erakor

TABLE 88. SITE EF11: Pango and Erakor. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Pango and Erakor	EF11	8.5

Geographic boundaries

17.7742°S 168.2596°E, 17.7933°S 168.3172°E

Geographic description (score = 2)

Pango and Erakor are villages located on the southern side of Efate Island. To the west of the villages is a convoluted coastline with inlets, semi-enclosed lagoons and small islands. The SUMA includes approximately 8 km of this coastline and associated marine habitats.

Justification (score = 2)

Workshop participants selected this site for its interlinked mangroves and seagrass beds, coral reefs, and the presence of species of conservation concern, including turtles and dugongs. Erakor village has implemented marine management strategies in the past, such as restricting certain gears and banning destructive fishing practices, in an effort to conserve the marine habitats nearby (Johannes and Hickey 2004; Nimoho et al. 2013). A mangrove management plan is proposed for Eratap and Erakor (Government of Vanuatu 2016). A resilience project found that villagers mostly harvest finfish, shellfish and crustaceans, suggesting that these are still relatively abundant in the area of the SUMA (McEvoy et al. 2016). Mangrove assemblages in this SUMA are likely to be similar to those described for Site EF10: Eratap.

Pango has a marine protected area (Government of Vanuatu 2016), with a fringing reef with high coral cover (51%) and abundant butterflyfishes and surgeonfishes (Vanuatu Reef Times 2005). However, the coastal waters between Eratap and Pango have mostly seagrass beds, although seagrass patches in the area are reportedly small (DEPC 2011).

This part of Efate Island has some green turtle nests, but the nesting beaches (and coastal habitats in general) have been heavily affected by development (Amos 2007). There are a small number of reports of green and hawksbill turtles still foraging in the area of the SUMA (Siota 2015). Efate Island in general, and this coastline in particular, is considered one of the main islands that support dugong populations (Chambers et al. 1989; Amos 2007; VESS 2017). There was no further detailed information specific to the site, but general information about Vanuatu and Efate mangroves, seagrass beds, dugongs and turtles can be found at Site T4: Linua, Site Q1: Quanlap, Site T8: Reef Islands and Site EF10: Eratap.

Type and number of sources (score =1.5)

Some information about this SUMA was contained in nine reports, but none of the sources provided significant details on the attributes of the SUMA. One additional report provided information about sea cucumber stocks in the genera south Efate area. The value of the attributes of this SUMA had to be inferred from general sources also used for Site T4: Linua, Site Q1: Quanlap, Site T8: Reef Islands and Site EF10: Eratap.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with seagrass beds and mangroves within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. Turtles, dugongs and a large number of fishes and invertebrates associated with seagrass beds and mangroves are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles and dugongs are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Pango and Erakor SUMA includes the Pango and Erakor marine tabu/conservation sites, which are included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for formal protection.

3.2.16.12 SITE EF12: EKASUVAT / ERAKOR 1ST LAGOON



FIGURE 83. SITE EF12: Ekasuvat / Erakor 1st Lagoon

TABLE 89. SITE EF12: Ekasuvat / Erakor 1st Lagoon. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Ekasuvat / Erakor 1 st Lagoon	EF12	8.5

Geographic boundaries

17.7641°S 168.3074°E, 17.7369°S 168.3382°E

Geographic description (score = 3)

Erakor Lagoon is located to the east side of Port Vila and is made up of two water bodies or lagoons: Ekasuvat and Emten. This SUMA includes only Ekasuvat Lagoon, which extends northeastward about 6 km from the sea, then turns eastward through a narrow channel and opens to Emten lagoon, to the east, through a connecting channel which is about 100 m wide. This connecting channel is a natural constriction to the tidal flow and it is now further constricted by a causeway and small road bridge. There are no substantial rivers or sources of fresh water flowing into the lagoons; the circulation and flushing is therefore by tidal action only.

Justification (score = 1.5)

Erakor Lagoon is fringed by mangroves and contains seagrass beds; the highly sheltered and enclosed nature of the lagoon provides an ideal fish nursery. Mangroves and seagrass beds have been reported for the SUMA; mangrove stands around Erakor Lagoon are some of the most extensive in the Port Vila area (DEPC 2011). Mangrove and seagrass communities in the bay are likely to be similar to those of Site EF10: Eratap nearby. The value of this type of habitat as a nursery area is highlighted for Site T4: Linua and Site Q1: Quanlap, and is listed for conservation in the NBSAP (Government of Vanuatu 2016).

Water quality issues were investigated in the 1990s, as the increased population and resulting sewage discharges in the area caused concerns about declining water quality (Holden 1992). Measurements found that flushing rates of both lagoons were negligible, and that the flushing time of Ekasuvat and Emten lagoons were 19 and 91 days, respectively, exacerbating the water quality issue (Carter 1990). More recent water quality analysis found elevated bacterial counts in the lagoon waters (DEPC 2011).

Type and number of sources (score = 1)

There were four reports that described the site directly, but only briefly and mostly pertaining to water quality issues or stating the need for conservation. The significance of the attributes of the SUMA can be inferred from more general sources referenced for Site T4: Linua, Site Q1: Quanlap and Site EF10: Eratap.

Obligations (score =3)

There are obligations to protect and sustainably manage species associated with seagrass beds and mangroves within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. Turtles and a large number of fishes and invertebrates associated with seagrass beds and mangroves are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Ekasuvat / Erakor 1st Lagoon SUMA includes the Ekasuvat / Erakor 1st Lagoon marine tabu/conservation sites, which are included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for formal protection.

3.2.16.13 SITE EF13: SHARK BAY TO ERUETI ISLAND

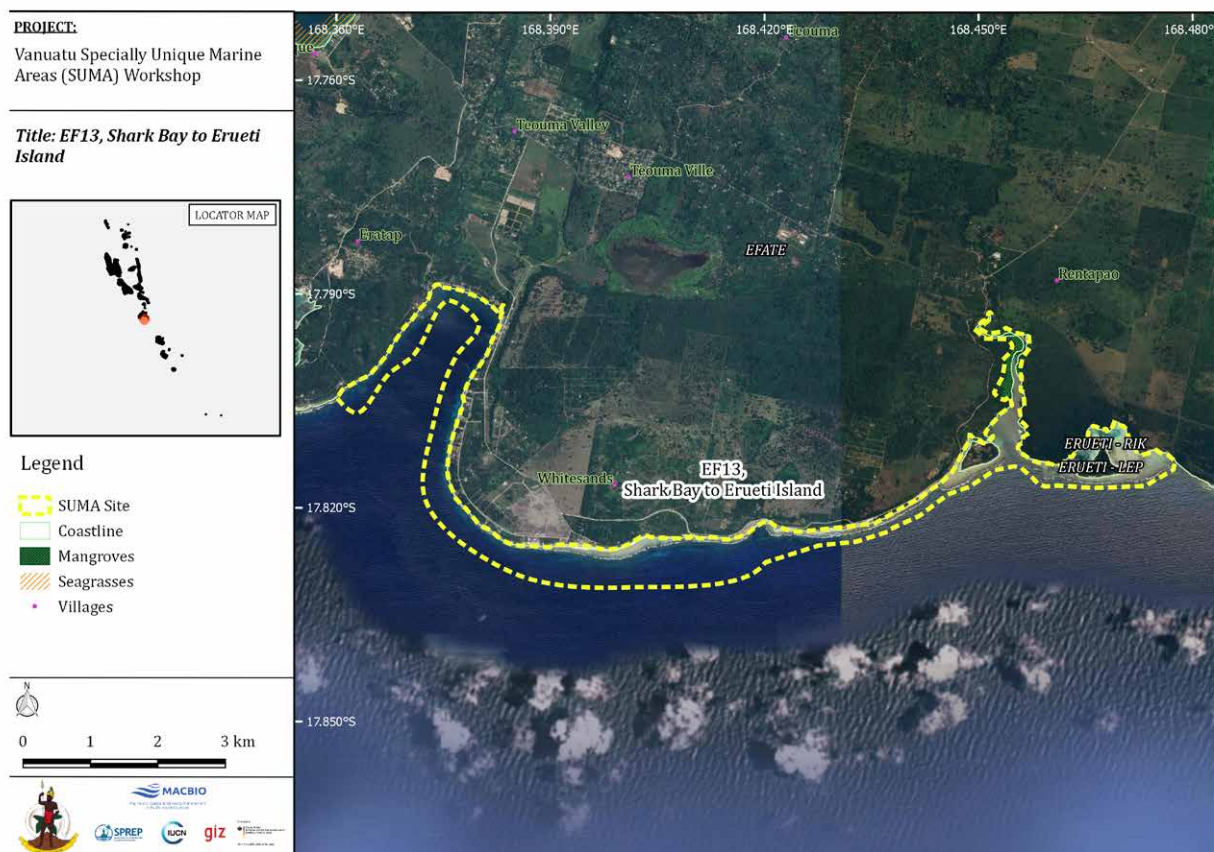


FIGURE 84. SITE EF13: Shark Bay to Erueti Island

TABLE 90. SITE EF13: Shark Bay to Erueti Island. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Shark Bay to Erueti Island	EF13	7.5

Geographic boundaries

17.7879°S 168.3608°E, 17.8354°S 168.4764°E

Geographic description (score = 2)

Shark Bay lies on the southern shore of Efate Island, and is the outlet for Teouma River, the largest river on Efate Island. The SUMA extends from Shark Bay approximately 15 km east to the Rentapoa river mouth, Erueti Bay and Erueti Island.

Justification (score = 2)

The coastline in this SUMA alternates between mangroves, black sand beaches and white sand beaches. There are two river mouths with estuarine habitats, the Teouma River in Shark Bay, and the Rentapoa River near the eastern boundary of the SUMA. The flow of these rivers vary according to rainfall, potentially creating a shifting and dynamic environment that changes seasonally (Kalfatak and Jaensch 2014). Mangrove areas are likely to be similar to those described for Eratap, which is adjacent to this SUMA (see Site EF10: Eratap). Near the mouth of the Teouma River is thought to be a leatherback turtle nesting site (Petro et al. 2007).

Within the eastern half of the SUMA lies an area commonly known as “White Sands”, where the fringing reefs are part of a local marine reserve declared in the 1980s (V. Molisa, pers. comm.). This suggests that species exploited elsewhere may be abundant here. Erueti Island is also a marine sanctuary (Government of Vanuatu 2008), with intact mangrove stands, a sheltered coral reef within the bay, and a turtle rehabilitation program set up to encompass existing turtle nesting areas on the beaches (V. Molisa, pers. comm.). General information about mangroves and coral reefs in Vanuatu and on Efate Island is reviewed in Site T4: Linua, Site Q1: Quanlap and Site EF3: Kakula.

Type and number of sources (score = 1.5)

The characteristics of this SUMA are mentioned in one peer-reviewed article and two reports, but with very little descriptive information. Sources used for Site T4: Linua, Site Q1: Quanlap, Site EF3: Kakula and Site EF10: Eratap are also relevant here.

Obligations (score = 2)

There are obligations to protect and sustainably manage species associated with coral reefs and mangroves within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. Turtles and a large number of fishes and invertebrates associated with coral reefs and mangroves are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles and dugongs are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles.

3.2.16.14 SITE EF14: PANGO POINT

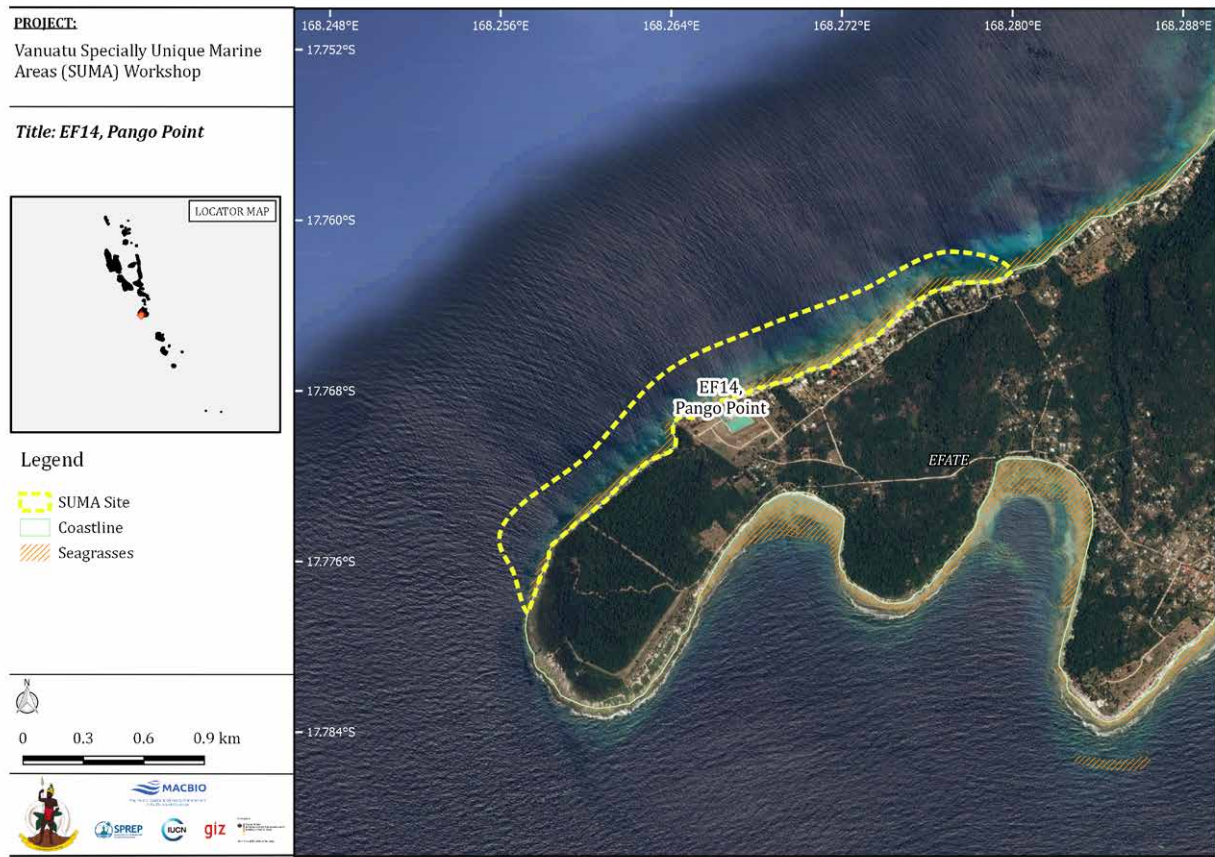


FIGURE 85. SITE EF14: Pango Point

TABLE 91. SITE EF14: Pango Point. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Pango Point	EF14	5

Geographic boundaries

17.7739°S 168.2541°E, 17.7624°S 168.28°E

Geographic description (score = 2)

Pango Point is a headland that frames the southern end of Mele Bay. The SUMA includes a stretch of 300 m along the northwest facing side of the headland, and extends approximately 200 m out to sea.

Justification (score = 1)

Pango Point has an exposed coral reef and popular dive sites; whilst this does not contribute directly to the values of the SUMA, it indicates a coral reef system that is healthy enough to be appealing for tourism. Off the tip of the Pango peninsula, the reef is highly complex, with caverns, swim-throughs and walls (WannaDive 2018), which usually attracts high densities of fishes. Further north, at a similar site, surveys at Devil's Point (beside Tukutuk Bay, see Site EF2: Tukutuk) reported very high coral cover of approximately 70%, with coral communities dominated by tabular, branching and submassive corals (Hill 2004). Collecting of aquarium fishes and fishing for finfish and invertebrates has resulted in a substantial decline in target species abundance in the Devil's Point area (Hill 2004). It is uncertain whether the reefs in the SUMA itself are in the same condition, but the site has been listed among others worthy of conservation (Government of Vanuatu 2016). General information about coral reefs in Vanuatu and in other areas of Efate Island is available at Site NO3: Vagtande Island and Site EF3: Kakula.

Type and number of sources (score = 1)

Only one website had some information about the reef structure in this SUMA. A Reef Check report described aspects of coral reefs further north, and the NBSAP listed it as being of interest for conservation. Further information about coral reefs in Vanuatu and in other areas of Efate Island is available in sources used for Site NO3: Vagtande Island and Site EF3: Kakula.

Obligations (score = 1)

There are obligations to protect and sustainably manage species associated with coral reefs within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. A large number of fishes and invertebrates associated with coral reefs are listed under CITES and on the IUCN Red List. The Pango Point SUMA includes the Pango marine tabu/conservation site, which is included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for formal protection.

3.2.16.15 SITE EF15: PORT VILA HARBOUR

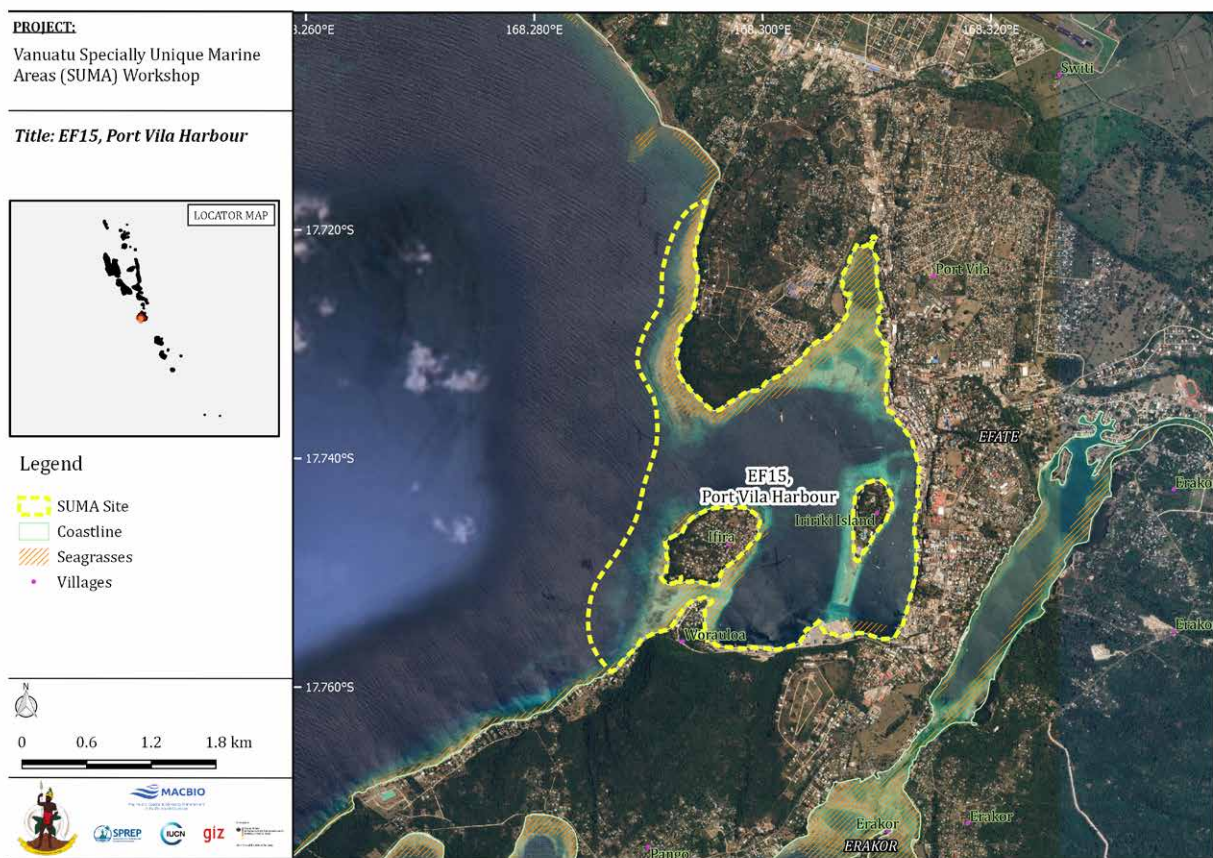


FIGURE 86. SITE EF15: Port Vila Harbour

TABLE 92. SITE EF15: Port Vila Harbour. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Port Vila Harbour	EF15	9

Geographic boundaries

17.7581°S 168.2838°E, 17.722°S 168.3188°E

Geographic description (score = 3)

Port Vila Harbour is a deep embayment on the western side of Efate Island, with a surface area of approximately 5 km². The SUMA includes all marine habitats within the harbour, which also has two islands (Iririki and Ifira Islands).

Justification (score = 2)

Marine habitats with Port Vila Harbour consist of coral reefs, sand, mangrove ecosystems, seagrass beds, brackish water and a lagoon. The mangroves and seagrass beds in the area provide a nursery area for fishes and other marine species (Ifira Marine Management Team 2017). The highly sheltered nature of the embayment may mean that these habitats are slightly different from elsewhere on Efate Island, where they might be subject to varying degrees of wave action.

Knowledge of species that may be present in Port Vila Harbour comes mainly from resource use information, which shows that there are fish assemblages (e.g. rabbitfish *Siganus vermiculatus*, mangru or *Scatophagus* sp., mullet, goatfish *Parupeneus spilurus*, parrotfish and redmouth), green snail and trochus, turtles and sharks (McEvoy et al. 2016). These species indicate that there is a basis for regeneration of the habitats and some resilience in the bay. General information about mangroves and coral reefs in Vanuatu and on Efate Island is reviewed in Site NO3: Vagtande Island, Site T4: Linua, and Site EF3: Kakula.

However, ecosystems in Port Vila Harbour are currently subject to pressures associated with high-density human habitation, including pollution, sedimentation and overharvesting of all components of the nearshore habitats.

Type and number of sources (score = 1)

Two reports had some information about habitats and species present in Port Vila Harbour that could be used to describe the SUMA. Sources used for Site NO3: Vagtande Island, Site T4: Linua, and Site EF10: Eratap are also relevant here.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with coral reefs, seagrass beds and mangroves within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. Turtles, dugongs and a large number of fishes and invertebrates associated with coral reefs, seagrass beds and mangroves are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles and dugongs are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Port Vila Harbour SUMA includes the Ifira marine tabu/conservation site, which is included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for formal protection, and is in the process of legal registration.



3.2.16.16 SITE EF16: HIDEAWAY ISLAND

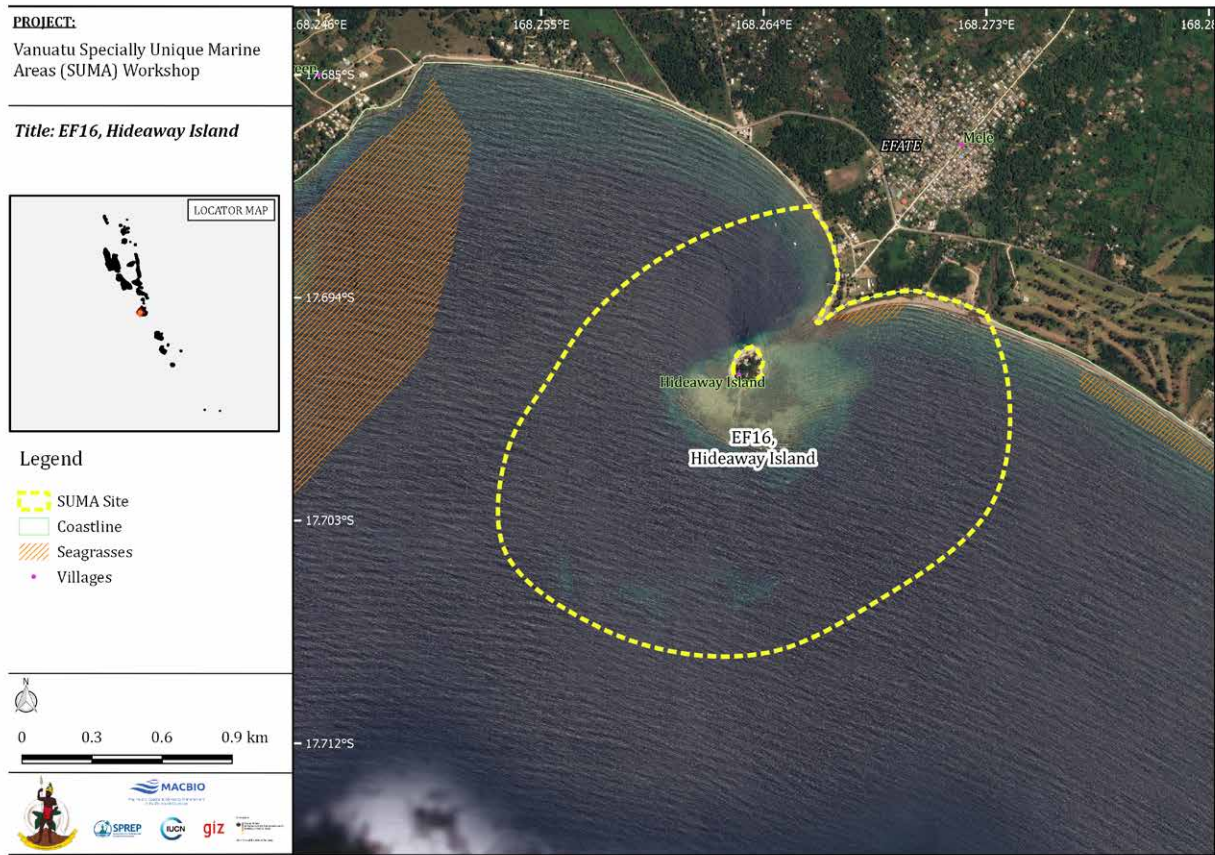


FIGURE 87. SITE EF16: Hideaway Island

TABLE 93. SITE EF16: Hideaway Island. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Hideaway Island	EF16	6

Geographic boundaries

17.7037°S 168.2513°E, 17.6969°S 168.2766°E

Geographic description (score = 3)

Hideaway Island is a small island (~140 by 180 m), 250 m off the coast in the central part of Mele Bay on Efate Island, surrounded by an extensive fringing reef. The entire island is owned by the Hideaway Island Resort. The SUMA include the island and surrounding marine environment, out to approximately 1.5 km. This includes patches of coral reef rising from deeper water just offshore from the island.

Justification (score = 1)

Hideaway Island is surrounded by fringing coral reefs protected within a marine sanctuary, and just offshore is Mele Reef, which rises to 6 m from the surface from deeper waters. These reefs are said to be dominated by branching staghorn corals (Big Blue Vanuatu 2017), which provide habitat for numerous coral reef organisms, but there are also reports that the reefs in this areas have suffered from COTS outbreaks in the past (Johnson et al. 2017). Further direct information about the coral reefs in this SUMA were not available, but information gathered for Site NO3: Vagtande Island, Site EF3: Kakula and Site EF14: Pango Point may also apply here.

Type and number of sources (score = 1)

One website and one report contained brief mentions of this SUMA. Sources used to describe coral reefs in Vanuatu and on Efate Island used in Site NO3: Vagtande Island, Site EF3: Kakula and Site EF14: Pango Point and also relevant here.

Obligations (score = 1)

There are obligations to protect and sustainably manage species associated with coral reefs within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. A large number of fishes and invertebrates associated with coral reefs are listed under CITES and on the IUCN Red List. The Hideaway Island SUMA includes the Mele marine tabu/conservation sites, which are included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for formal protection.

3.2.16.17 SITE EF17: ERETOKA ISLAND

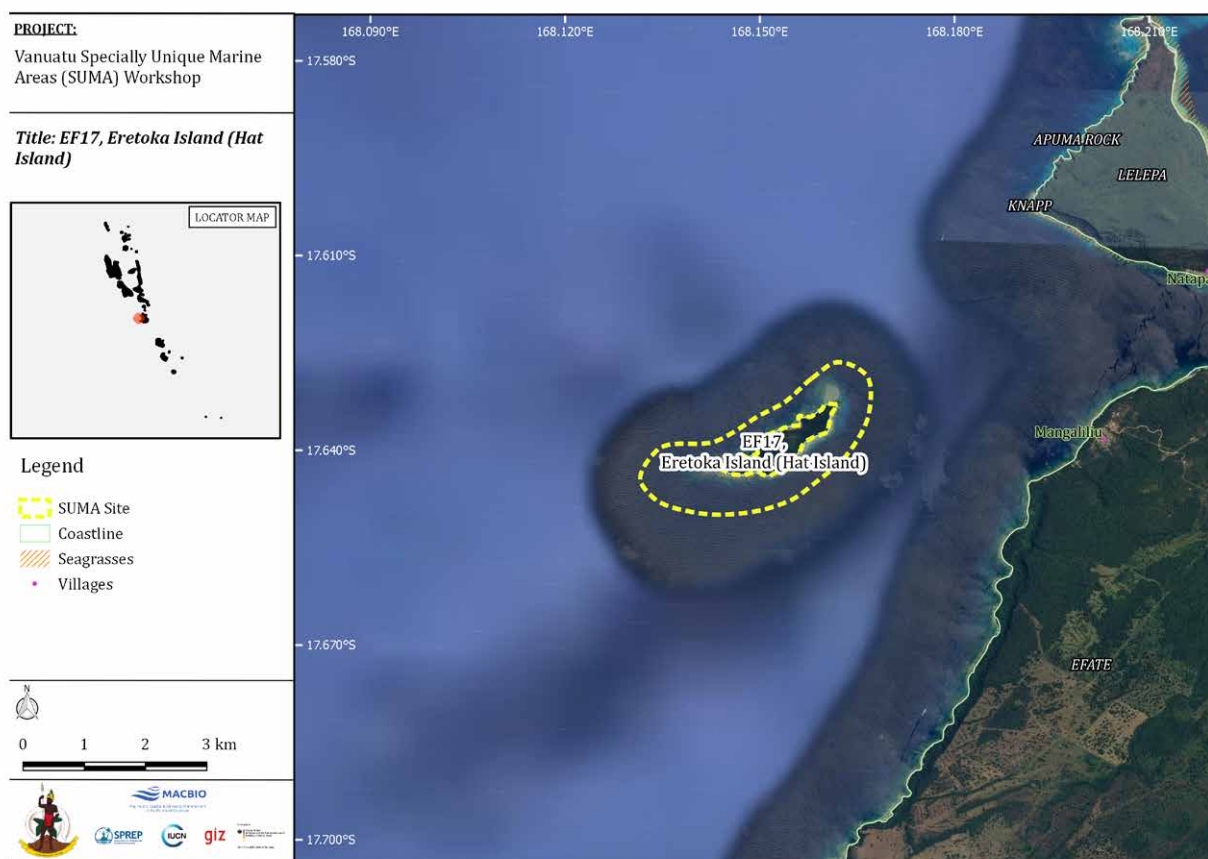


FIGURE 88. SITE EF17: Eretoka Island

TABLE 94. SITE EF17: Eretoka Island. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Eretoka Island	EF17	9

Geographic boundaries

17.6418°S 168.1302°E, 17.6394°S 168.1718°E

Geographic description (score = 3)

Eretoka Island, or Hat Island, is located off the western side of Efate Island. It is approximately 2.3 km in length with a maximum width of 670 m. The island's perimeter consists largely of a raised coral platform of about 2m in height, broken intermittently by short stretches of sandy inlet. The SUMA includes all the shallow marine habitats surrounding the island.

Justification (score = 1.5)

This SUMA was identified for its value as a relatively exposed and isolated reef (see Site NO3: Vagtande Island), and, by virtue of the surrounding deep waters, a site for potential tuna aggregations. An active nearshore fish aggregation device (FAD) and seasonal nutrient enrichment from nearby Havannah Harbour attract yellowfin and skipjack tuna close to shore (Vanuatu Cultural Centre 2007). The deep sea just off Eretoka is known to be a productive area for deepwater fishes (Cillauren et al. 2002; Vanuatu Fisheries Department 2016); in fact, the waters around Efate Island has been calculated as providing the third-highest percentage (12.6%) of suitable habitat for deepwater fishes in Vanuatu (Amos 2007). The species *Etelis carbunculus*, *E. coruscans* and *Pristipomoides multidens* are especially abundant (Cillauren et al. 2002).

Areas where pelagic and deep-water species occur close to land are rare, and limited to oceanic islands with properties similar to seamounts, like the waters around Eretoka Island (see Site NO1: Northwest part of Santo). A Reef Check survey in 2004 found moderate coral cover (~20%) on steep reef slopes dominated by rocky substrata, with high abundance of aquarium and food fishes that have been depleted elsewhere (Hill 2004). This SUMA could therefore provide a source of larvae to replenish degraded or overexploited reefs nearby.

Eretoka Island lies within Vanuatu's first World Heritage Site, called Chief Roi Mata's Domain and designated as a cultural landscape (Vanuatu Cultural Centre 2007, <https://whc.unesco.org/en/list/1280> Accessed 11/4/18). Long-standing tabu areas associated with the cultural value of this area may have resulted in healthier target species populations than those elsewhere in the general Efate Island area. The north Efate area has been recognised for its biodiversity and is included as one of the Key Biodiversity Areas of Vanuatu (USP 2012).

No further information was available directly about the coral reefs, tuna or deepwater fishes around Erekota Island. Information about coral reefs in Vanuatu and Efate Island is presented for Site NO3: Vagtande Island and Site EF3: Kakula. Information about tuna and deepwater fishes in Vanuatu is available at Site NO1: Northwest part of Santo and Site CO3: Eastern Vanuatu canyons.

Type and number of sources (score = 1.5)

Six reports mentioned this SUMA, but aside from the Reef Check survey, there were very few details about the attributes of the site. One report gave an indication of the importance of Efate Island for deepwater fishes. Sources used for information about oceanic or exposed coral reefs, tuna and deepwater fishes more generally, presented in Site NO1: Northwest part of Santo, Site NO3: Vagtande Island, Site EF3: Kakula and Site CO3: Eastern Vanuatu canyons are also relevant here.

Obligations (score = 3)

Eretoka Island and part of Lelepa Island is Vanuatu's first World Heritage Site (Chief Roi Mata's Domain) with an area of 886 ha and a buffer zone of 1,275 ha and various levels and types of protection are associated with this designation (<https://whc.unesco.org/en/list/1280>, Accessed 11/4/18). The Fisheries Management Act 2014 outlines obligations for the protection and sustainable use of fish stocks, including pelagic, demersal and deep-water species. The IUCN Red list includes the four species of tuna that are fished in Vanuatu, skipjack tuna are listed as Least Concern, yellowfin and albacore tuna are Near Threatened and bigeye tuna are Vulnerable. There are obligations to protect and sustainably manage species associated with coral reefs within the Environmental Protection and Conservation Act 2002 and the Fisheries Management Act 2014. A large number of fishes and invertebrates associated with coral reefs are listed under CITES and on the IUCN Red List. Eretoka Island SUMA site includes Eretoka Island marine tabu/conservation site which is included in the NBSAP (2018–2030) as an existing marine conservation site.

3.2.16.18 SITE EF18: PAUL'S ROCK



FIGURE 89. SITE EF18: Paul's Rock

TABLE 95. SITE EF18: Paul's Rock. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Paul's Rock	EF18	7.5

Geographic boundaries

17.6449°S 168.1674°E, 17.621°S 168.1938°E

Geographic description (score = 2)

Paul's Rock is a coral reef pinnacle rising from deep water to approximately 4 m from the surface between Eretoka Island and Efate Island. The SUMA includes an oblong area surrounding the rock, approximately 2.5 km in diameter.

Justification (score = 1)

Workshop participants noted that this SUMA is a famous dive site, by virtue of its highly complex habitat structure, its isolation in deep water, its proximity to potential source reefs and its seamount-like qualities of attracting large pelagic and deepwater species. Coral communities are typical of reefs adapted to strong wave action (Done and Navin 1990). Some information exists on diving and sailing websites (e.g. <https://vimeo.com/54008385>), but there was no other technical information about the attributes of Paul's Rock. Information and sources used for Site EF17: Eretoka Island, including those relating to deep-water fish species, also apply here.

Type and number of sources (score = 1.5)

One report and one website, with an underwater video, was used to gather some information about this site. No other papers or reports were available, but all sources used for Site EF17: Eretoka Island are also relevant here.

Obligations (score = 3)

The Fisheries Management Act 2014 outlines obligations for the protection and sustainable use of fish stocks, including pelagic, demersal and deep-water species. The IUCN Red list includes the four species of tuna that are fished in Vanuatu and may occur near this pinnacle; skipjack tuna are listed as Least Concern, yellowfin and albacore tuna are Near Threatened and bigeye tuna are Vulnerable. There are obligations to protect and sustainably manage species associated with coral reefs within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. A large number of fishes and invertebrates associated with coral reefs are listed under CITES and on the IUCN Red List. The Paul’s Rock SUMA includes the Mangaliliu marine tabu/conservation site, which is included in the NBSAP (2018–2030) as an existing marine conservation site.

3.2.16.19 SITE EF19: SCOTT REEF

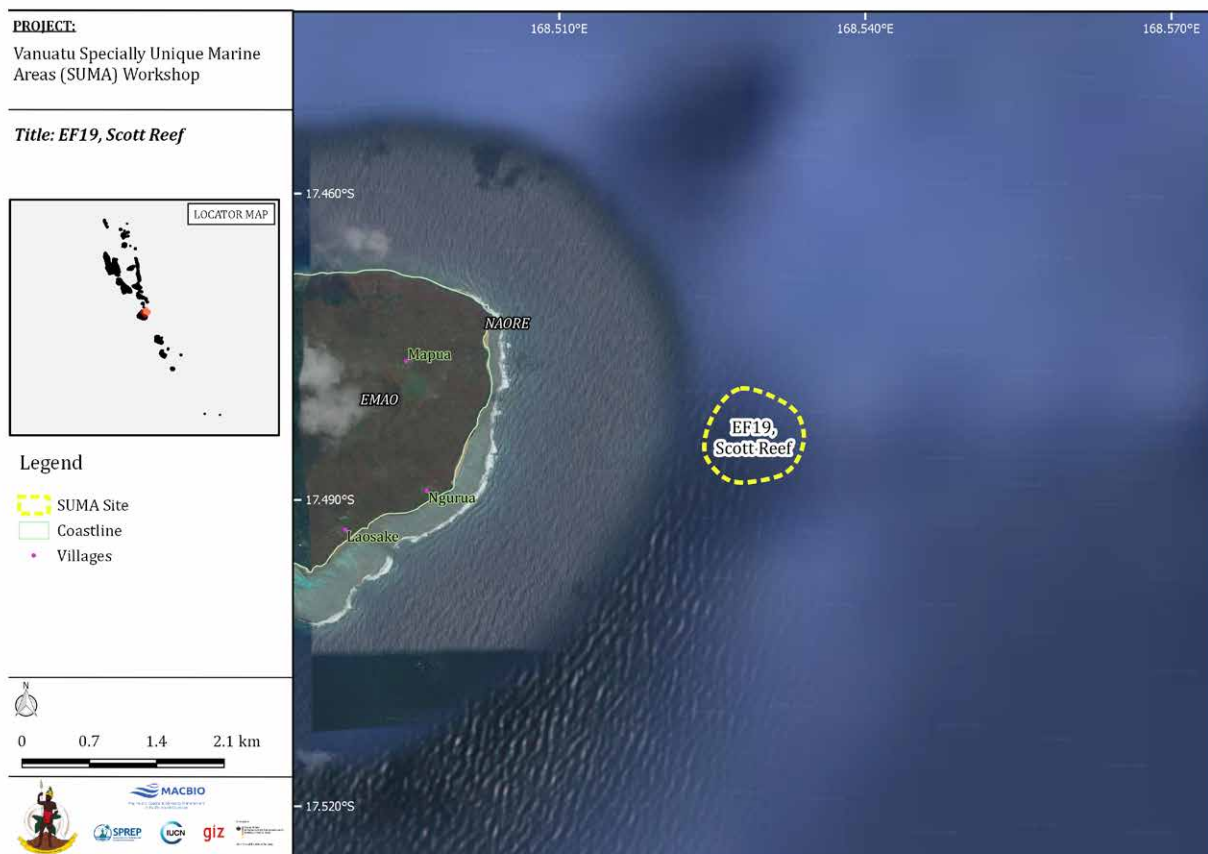


FIGURE 90. SITE EF19: Scott Reef

TABLE 96. SITE EF19: Scott Reef. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Scott Reef	EF19	5

Geographic boundaries

17.4779°S 168.5268°E, 17.4903°S 168.5314°E

Geographic description (score = 1)

Scott Reef is located off the north coast of Efate Island, three miles east of Emau Island. The SUMA is a circular area, including the reef and surrounding waters, approximately 1 km in diameter.

Justification (score = 1)

Workshop participants chose this SUMA for its importance to tuna and deepwater fish fisheries; this suggests a highly productive area where the reef provides the topographic structure of a seamount, which attracts pelagic species. Catch rates for deepwater species are relatively high here, especially for *Etelis carbunculus*, *E. coruscans*, *Pristipomoides flavipinnis* and *P. multidens* (Cillauren et al. 2002). The values of the SUMA are likely to be related to the characteristics of seamounts and isolated reefs. The general area northeast of Efate Island is mentioned by Bell and Amos (1993) and Vanuatu Fisheries Department (2016) as an important location for deepwater fishes, but the scale is too broad to determine the exact site. No information exists specific to this SUMA, but knowledge gathered for Site NO1: Northwest part of Santo, Site CO3: Eastern Vanuatu canyons and Site EF18: Paul's Rock is likely to apply here.

Type and number of sources (score = 1)

No direct information was available for this site, other than three fisheries reports about the general area and information presented by expert workshop participants. Sources used for Site NO1: Northwest part of Santo, Site CO3: Eastern Vanuatu canyons and Site EF17: Eretoka Island are also relevant here.

Obligations (score = 2)

The Fisheries Management Act 2014 outlines obligations for the protection and sustainable use of fish stocks, including pelagic, demersal and deep-water species. The IUCN Red list includes the four species of tuna that are fished in Vanuatu, skipjack tuna are listed as Least Concern, yellowfin and albacore tuna are Near Threatened and bigeye tuna are Vulnerable. There are obligations to protect and sustainably manage species associated with coral reefs within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. A large number of fishes and invertebrates associated with coral reefs are listed under CITES and on the IUCN Red List.

3.2.16.20 SITE EF20: ETON PLATEAU

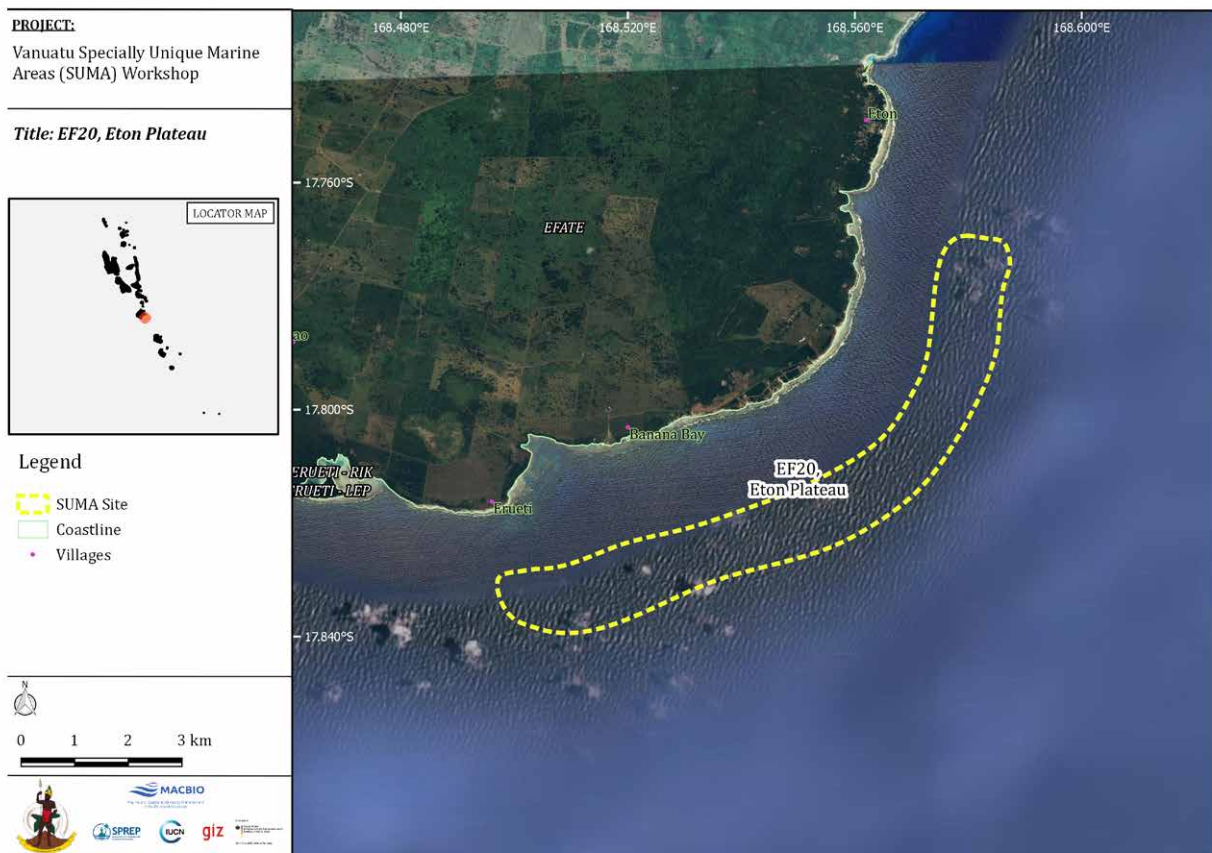


FIGURE 91. SITE EF20: Eton Plateau

TABLE 97. SITE EF20: Eton Plateau. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Eton Plateau	EF20	4

Geographic boundaries

17.8310°S 168.4953°E, 17.7918°S 168.6020°E

Geographic description (score = 1)

Eton Plateau is a shallow bank off the southeastern corner of Efate Island. The SUMA around this plateau is 14 km long, 1 km wide and located between 1 and 1.5 km offshore.

Justification (score =1)

Marine habitats that drop steeply into deep waters around Efate Island are highly productive, even at depth. The general area off southeastern Efate Island was highlighted as especially productive for deepwater fishes (Vanuatu Fisheries Department 2016), suggesting that it may also be productive and diverse for other groups of organisms. Catch rates for deepwater species are relatively high here, especially for *Etelis carbunculus*, *E. coruscans*, *Pristipomoides multidens* and *Lutjanus malabaricus* (Cillauren et al. 2002). The values of the SUMA are likely to be related to the characteristics of seamounts and isolated reefs. No further information exists specific to this SUMA, but knowledge gathered for Site NO1: Northwest part of Santo, Site CO3: Eastern Vanuatu canyons and Site EF18: Paul’s Rock is likely to apply here.

Type and number of sources (score = 1)

Information for this site was drawn from a fisheries report, a reference point on a map in a fisheries management report and information presented by expert workshop participants. Sources used for Site NO1: Northwest part of Santo, Site CO3: Eastern Vanuatu canyons and Site EF17: Eretoka Island are also relevant here.

Obligations (score = 1)

The Fisheries Management Act 2014 outlines obligations for the protection and sustainable use of fish stocks, including deep-water species. The IUCN Red list includes a number of deepwater fishes. There are obligations to protect and sustainably manage species associated with coral reefs within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. A large number of fishes and invertebrates associated with coral reefs are listed under CITES and on the IUCN Red List.



3.2.16.21 SITE EF21: SOUTHWEST PELE ISLAND

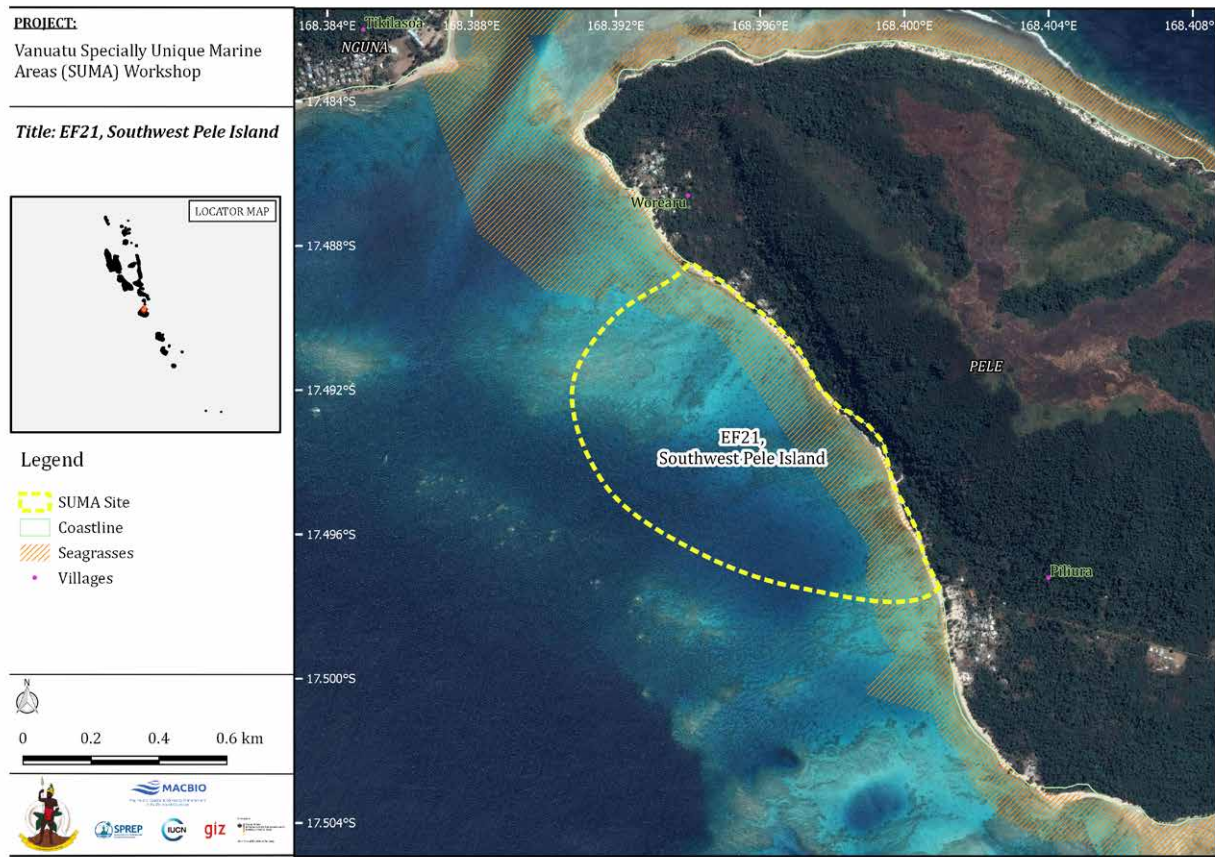


FIGURE 92. SITE EF21: Southwest Pele Island

TABLE 98. SITE EF21: Southwest Pele Island. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Southwest Pele Island	EF21	5

Geographic boundaries

17.4878°S 168.3943°E, 17.5008°S 168.3973°E

Geographic description (score = 2)

Pele Island (or Pélé Island) is a volcanic island 18 km north of the island of Efate Island. It has a total area of 29 km² and has a population of 200–220 people residing in four villages. The SUMA is a stretch of coastal and marine habitat just over 1 km long on the southwestern side of Pele Island, and extends around 300 m out to sea.

Justification (score = 1)

Expert workshop participants identified this SUMA as being a nesting site for hawksbill turtles. Turtles are known to nest throughout the northern part of Efate Island and associated islands; hawksbill turtles are regularly reported from around Pele Island (Siota 2015). The north Efate area has been recognised for its biodiversity and is included as one of the Key Biodiversity Areas of Vanuatu (USP 2012). No direct data exist on nesting turtles at this site, but the habitat appears favourable; workshop participants also noted the presence of seagrass beds in the area. For further information about turtles and seagrass beds in Vanuatu, see Site Q1: Quanlap, and for more knowledge about the Nguna-Pele MPA network see Site EF6: Pele Island (northeast).

Type and number of sources (score = 1)

One report mentioned the presence of foraging turtles in the general area of Pele Island, and one report includes the island within the North Efate Key Biodiversity Area. For other information about nesting turtles in this region, sources used in Site Q1: Quanlap, Site EF6: Pele Island (northeast) and other SUMAs around Efate Island are also relevant here.

Obligations (score = 1)

There are obligations to protect and sustainably manage turtles within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Hawksbill turtles are listed as Critically Endangered under the IUCN Red List of Threatened Species, and are also listed under CITES. Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Southwest Pele Island SUMA includes the Nguna/Pele marine tabu/conservation sites, which are included in the NBSAP (2018–2030) as an existing marine conservation site.

3.2.16.22 SITE EF22: UTANLANG

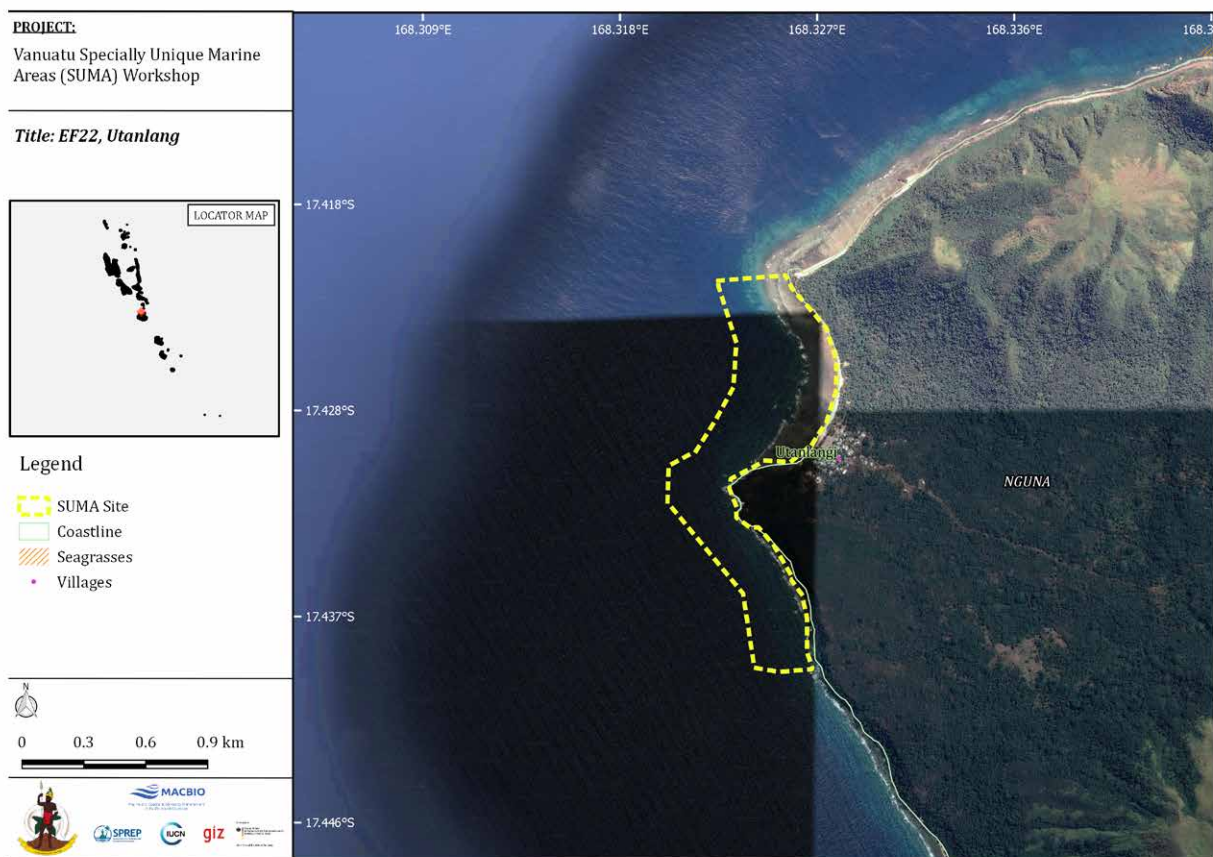


FIGURE 93. SITE EF22: Utanlang

TABLE 99. SITE EF22: Utanlang. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Utanlang	EF22	5

Geographic boundaries

17.4390°S 168.3195°E, 17.4217°S 168.3283°E

Geographic description (score = 2)

Utanlang is the last village on the northern tip of Nguna Island. The SUMA encompasses the village foreshore area and the western coast of the headland, with associated marine habitats.

Justification (score = 1)

The waters around Utanlang Village are included within the Nguna-Pele MPA network (Welch 2016). Coral reefs off Utanlang were identified by workshop participants for their abundance of fan corals, or gorgonians. No further information exists specifically about this SUMA, but coral reef attributes described for Site EF6: Pele Island (northeast) are likely to be similar here. They may experience particularly strong currents, indicated by the presence of gorgonian fans, which tend to thrive on exposed reef walls.

Type and number of sources (score = 1)

Only one report mentioned Utanlang Village, listing it among the protected areas in the Nguna-Pele MPA network. Sources reviewed for Site EF6: Pele Island (northeast) are also relevant here.

Obligations (score = 1)

Nguna Island is a part of the Nguna-Pele Marine Protected Area, which was established in 2003. There are additional obligations to protect and sustainably manage species associated with coral reefs within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. A large number of fishes and invertebrates associated with coral reefs are listed under CITES and on the IUCN Red List. The Utanlang SUMA includes the Nguna/Pele marine tabu/conservation sites, which are included in the NBSAP (2018–2030) as an existing marine conservation site.

3.2.16.23 SITE EF23: NORTHEAST NGUNA ISLAND

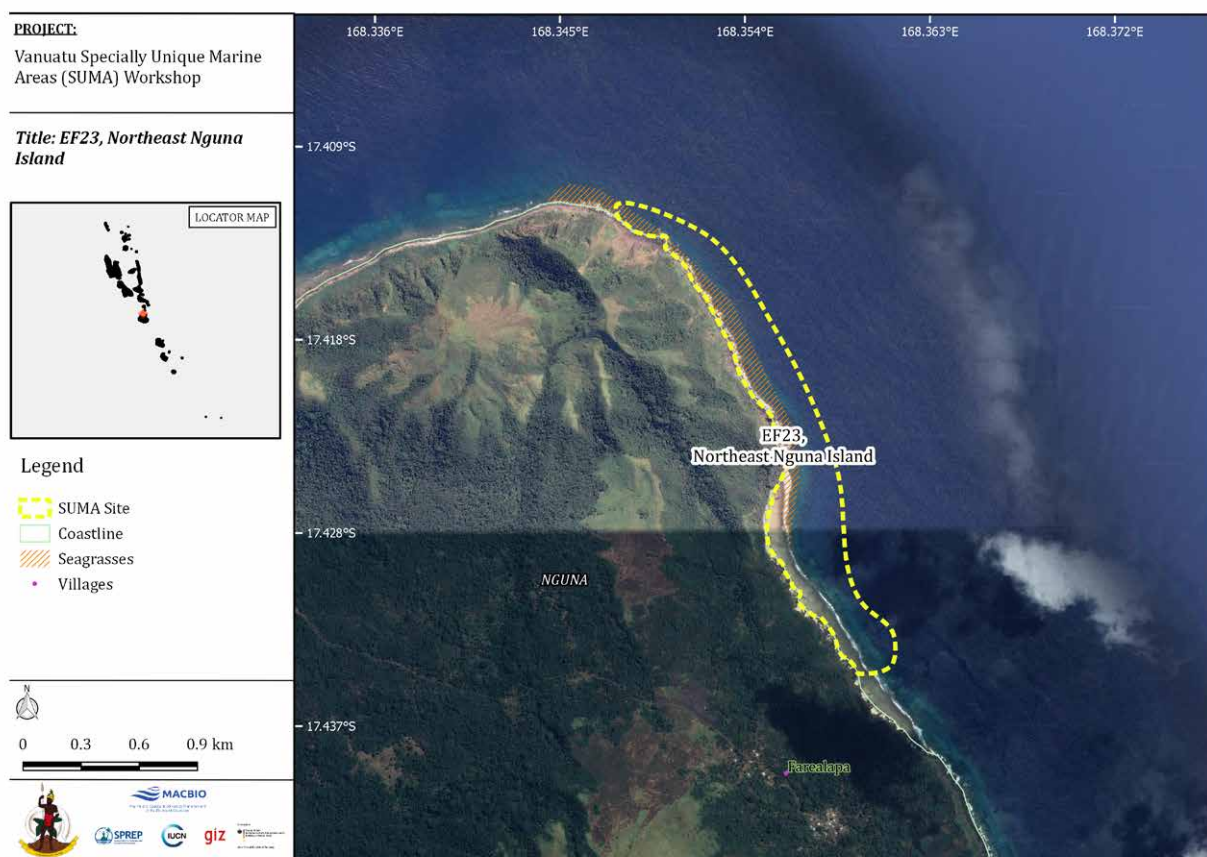


FIGURE 94. SITE EF23: Northeast Nguna Island

TABLE 100. SITE EF23: Northeast Nguna Island. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Northeast Nguna Island	EF23	5

Geographic boundaries

17.4097°S 168.352°E, 17.4354°S 168.3584°E

Geographic description (score = 2)

This SUMA includes a stretch of coastline along the northeastern end of Nguna Island, approximately 2.5 km long and 200 m wide. It includes a rocky shoreline, a beach and a narrow coral reef flat and associated slope.

Justification (score = 1)

This SUMA was identified for including seagrass beds and turtle nesting habitat. A turtle monitoring program exists as part of the Nguna-Pele Marine Protected Area (Island Life 2015; Siota 2015; Government of Vanuatu 2016). Foraging green and hawksbill turtles are regularly recorded around Nguna Island (Siota 2015), but no reports exist of nests in this SUMA. For further information about seagrass beds and turtles in Vanuatu, see Site T4: Linua and Site Q1: Quanlap.

Type and number of sources (score = 1)

One website and two reports provided information about seagrass and turtles in the general Nguna-Pele area. Sources used for Site T4: Linua and Site Q1: Quanlap can give more general information about the values of this SUMA.

Obligations (score = 1)

There are obligations to protect and sustainably manage species associated with seagrass beds within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Turtles are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Northeast Nguna Island SUMA includes the Nguna/Pele marine tabu/conservation sites, which are included in the NBSAP (2018–2030) as an existing marine conservation site.

3.2.16.24 SITE EF24: SIVIRI

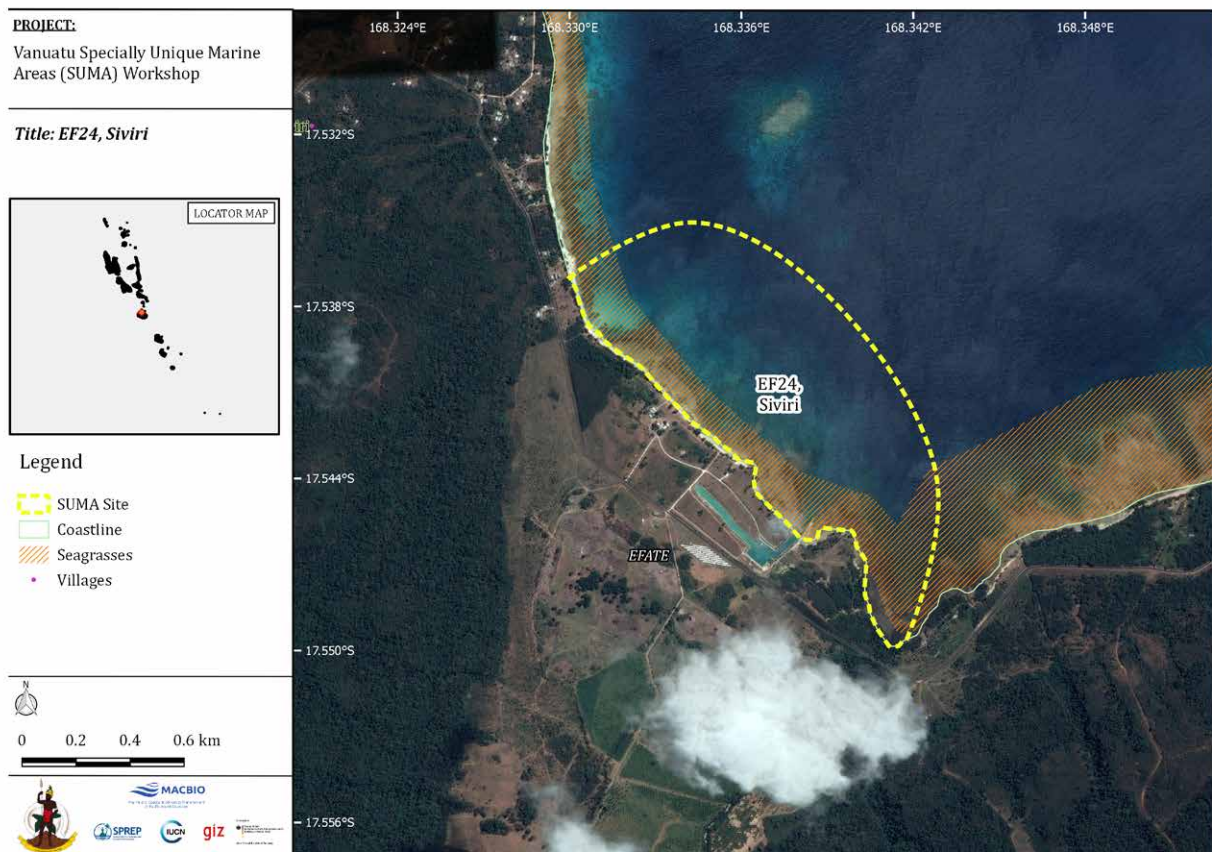


FIGURE 95. SITE EF24: Siviri

TABLE 101. SITE EF24: Siviri. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Shefa Province	Siviri	EF24	8

Geographic boundaries

17.5328°S 168.3345°E, 17.5500°S 168.3413°E

Geographic description (score = 2)

Siviri is a village on the northern coast of Efate Island, just east of Moso Island. There is an extensive reef flat with seagrass beds just off the coast. The SUMA includes 4 km of coastline and extends approximately 2 km off the shore.

Justification (score = 2)

This SUMA was chosen primarily for its seagrass beds and its importance to turtles; the NBSAP also highlighted it as an area for the conservation of marine species (Government of Vanuatu 2016). A relatively large number of green and hawksbill turtles has been recorded off Siviri Village since the 1990s (Siota 2015). No further information was found about seagrasses and turtles in this SUMA, but these attributes have been described more generally and for Vanuatu in Site T4: Linua and Site Q1: Quanlap.

An extensive coral reef flat also extends off the coast from Siviri Village, and is included in the SUMA and the existing conservation area. A finfish survey reported high densities of surgeonfishes and parrotfishes in the SUMA (Welch 2016); these herbivores are known to be important for the maintenance of coral dominance over macroalgae (Cheal et al. 2010b). They therefore contribute to coral reef health and resilience (Holbrook et al. 2016a); areas where they are still abundant are becoming more valuable as fishing depletes their numbers elsewhere. Coral surveys in 2016 reported that as a result of COTS outbreaks, macroalgal cover had increased in this SUMA (51%), and coral cover was very low (5%) (Johnson et al. 2016). This adds to the importance of protecting herbivores in this SUMA. Despite the low coral cover, structural complexity and coral diversity were high (Johnson et al. 2016), suggesting high recovery potential in this area. More broadly, the attributes of seagrasses and coral reefs in this SUMA are likely to be similar to those described in Site EF3: Kakula.

Type and number of sources (score = 2)

Three reports mention the attributes of this SUMA directly, and two peer-reviewed papers were used to highlight the importance of coral reef herbivores. Aside from this, the special, unique nature of this site must be inferred from the NBSAP and general sources used for Site T4: Linua, Site Q1: Quanlap and Site EF3: Kakula.

Obligations (score = 2)

There are obligations to protect and sustainably manage species associated with seagrass beds and coral reefs within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Turtles, fishes and other species commonly found in seagrass beds and on coral reefs are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Siviri SUMA includes the Siviri marine tabu/conservation sites, which are included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for formal protection.

3.2.17 Inshore: Tafea Province: Tanna Island

This region includes Tanna, Aniwa, Futuna, Erroma and Aneityum Islands (Tafea).

3.2.17.1 SITE TAF1: PORT RESOLUTION

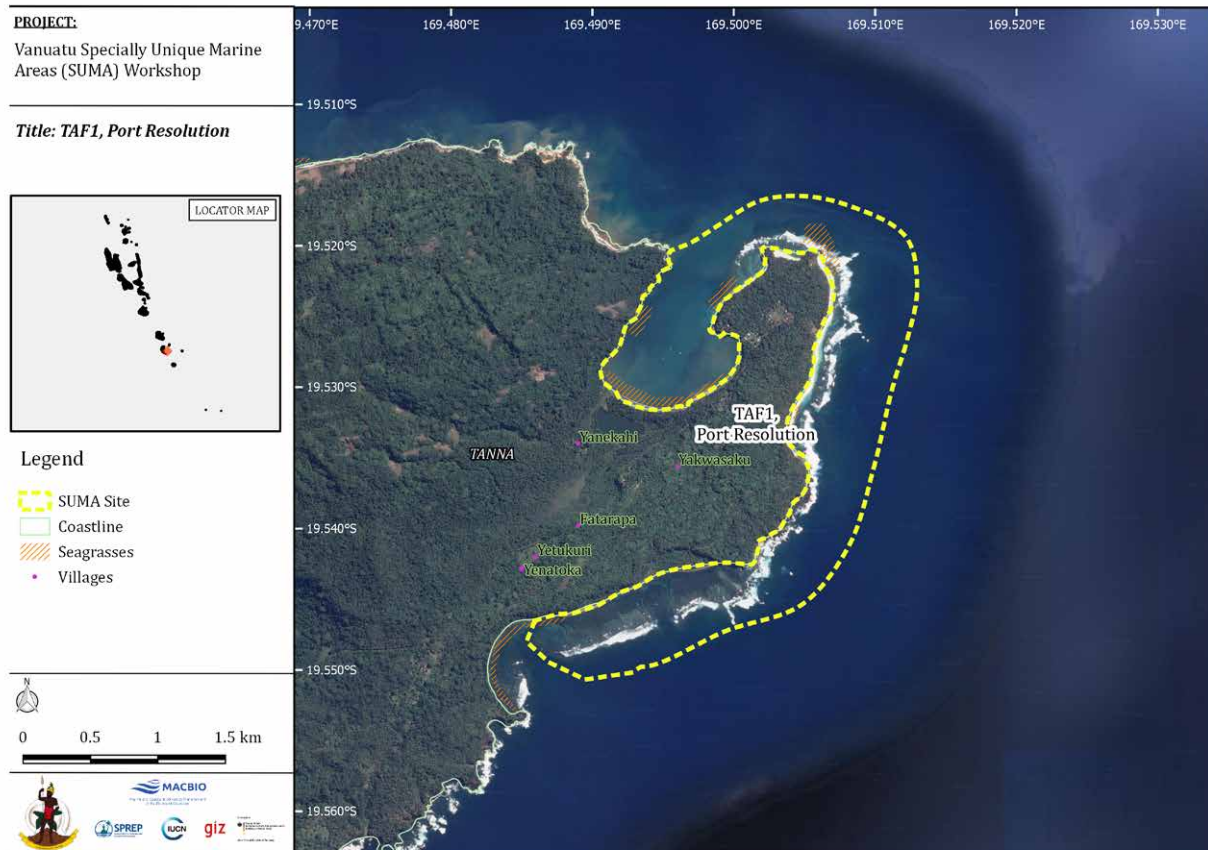


FIGURE 96. SITE TAF1: Port Resolution

TABLE 102. SITE TAF1: Port Resolution. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Tafea Province	Port Resolution	TAF1	9.5

Geographic boundaries

19.5494°S 169.4849°E, 19.5189°S 169.5146°E

Geographic description (score = 3)

Tanna Island is 40 km long and 19 km wide, with a total area of 550 km², and is located in the Tafea Province. Port Resolution is a natural harbour, sheltered from the prevailing southeasterly trade winds by a large peninsula, with coral reef on the ocean side of the peninsula. The SUMA includes the entire bay and a stretch of inshore marine habitats of a little over 3 km along the ocean side of the peninsula.

Justification (score = 1.5)

The Port Resolution area contains the only mangrove area of Tanna, coral reefs in good condition, seagrass beds, predators such as large sharks, nesting turtles and community interest in implementing protected area management (V. Molisa, pers. comm.). No further information was available directly about Tanna Island mangroves, although the NBSAP mentions efforts to replant degraded mangrove areas (Government of Vanuatu 2016). Similarly, Tanna Island's coral

reefs have not been surveyed, and it is unclear which predatory species are common. Coral reefs in general, and shark species common in Vanuatu's waters, have been reviewed in Site NO3: Vagtande Island and Site S1: Palekula to Turtle Bay, respectively.

In the past, there were known seagrass beds in the bay, with three species recorded: *Cymodocea rotundata*, *C. serrulata* and *Thalassia hemprichii* (Chambers et al. 1990). The NBSAP mentions the need for conservation of green, hawksbill and leatherback turtles in Tanna, but very little further information was available. There are also reports of the presence of tame dugongs in the Bay (Amos 2007; Government of Vanuatu 2016), but surveys in the 1980s recorded only one individual (Chambers et al. 1989).

Type and number of sources (score = 2)

Vanuatu's NBSAP and three reports provided information about this SUMA, but with very little detail. Sources used for Site NO3: Vagtande Island and Site S1: Palekula to Turtle Bay are also relevant here.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with coral reefs, seagrass beds and mangroves within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Turtles, dugongs, sharks and a large number of fishes and invertebrates associated with coral reefs, seagrass beds and mangroves are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles and dugongs are Vulnerable). Vanuatu has National Plan of Actions (NPOAs) for all sea turtles and sharks. The Port Resolution SUMA includes the Shark Bay marine tabu/conservation sites, which are included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for formal protection.

3.2.17.2 SITE TAF2: WHITE GRASS

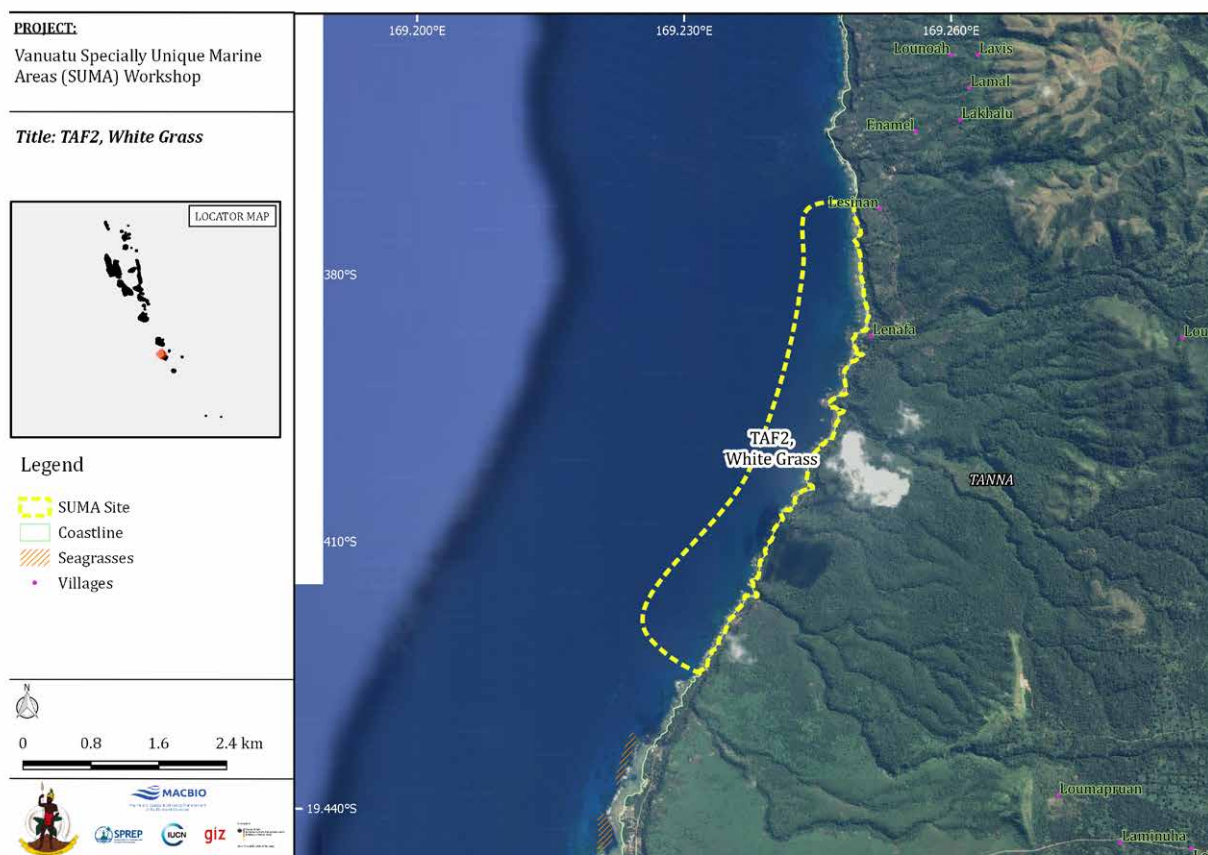


FIGURE 97. SITE TAF2: White Grass

TABLE 103. SITE TAF2: White Grass. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Tafea Province	White Grass	TAF2	7.5

Geographic boundaries

19.4216°S 169.2239°E, 19.3749°S 169.2563°E

Geographic description (score = 2)

This SUMA lies on the northeastern coast of Tanna Island, where the reef drops off abruptly into deep water. It covers approximately 7 km of coastline and 500 m out to sea.

Justification (score = 1.5)

This SUMA was identified for its abrupt reef topography against a rugged and complex coastline and for its high biodiversity, as a congregating site for turtles, for the passage of whales and healthy populations of predators (workshop pers. comm.). Tourism websites advertise the “untouched” underwater environment and describe a highly complex reef topography (White Grass Ocean Resort 2017), which typically hosts high biodiversity and attracts pelagic predators (see Site P5: Devil’s Rock). A rapid assessment of a wreckage nearby confirmed the complex nature of the reef, with a steep dropoff and the presence of sea snakes and trevallies (Ham and Kaltavara 2010). There was no other information specifically about this SUMA, or about its attributes around Tanna Island, but general information about coral reefs, turtles, predators and whales can be found at Site NO3: Vagtande Island, Site Q1: Quanlap, Site S1: Palekula to Turtle Bay and Site S2: Hog Harbour and Port Orly Conservation Area.

Type and number of sources (score = 1)

One tourism website had information about this SUMA, and one rapid assessment report described a coral reef site near the SUMA. No other references were available, but sources used for a number of other sites are relevant here: Site NO3: Vagtande Island, Site Q1: Quanlap, Site S1: Palekula to Turtle Bay, Site P5: Devil’s Rock and Site S2: Hog Harbour and Port Orly Conservation Area.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with coral reefs, seagrass beds and mangroves within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Turtles, sharks, cetaceans and a large number of fishes and invertebrates associated with coral reefs, seagrass beds and mangroves are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles and sharks. The White Grass SUMA includes the White Grass marine tabu/conservation sites, which are included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for formal protection.

3.2.17.3 SITE TAF3: WHITE SANDS



FIGURE 98. SITE TAF3: White Sands

TABLE 104. SITE TAF3: White Sands. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Tafea Province	White Sands	TAF3	5.5

Geographic boundaries

19.4215°S 169.3519°E, 19.5244°S 169.4594°E

Geographic description (score = 2)

White Sands is a village located on the eastern side of the Tanna Island, near Sulphur Bay. This SUMA extends along a 17 km stretch of Tanna Island’s east coast, including inshore marine habitats ~500 m out to sea.

Justification (score = 1)

Workshop participants chose this SUMA for coral reefs in good condition, high abundances of predators and high densities of sardines, indicating a highly productive coastline. East Tanna in general has also seen passing frigate tuna close to the shore (Amos 2007). Exposed coral reefs with complex underwater topography typically attract high biodiversity and pelagic predators (see Site P5: Devil’s Rock). There was no other information specifically about this SUMA, or about its attributes around Tanna Island, but general information about coral reefs and predators can be found at Site NO3: Vagtande Island and Site S1: Palekula to Turtle Bay.

Type and number of sources (score = 0.5)

One report had information about this SUMA. No other references were available, but sources used for a number of other sites are relevant here: Site NO3: Vagtande Island, Site S1: Palekula to Turtle Bay and Site P5: Devil’s Rock.

Obligations (score = 2)

There are obligations to protect and sustainably manage species associated with coral reefs within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Sharks and a large number of fishes and invertebrates associated with coral reefs, seagrass beds and mangroves are listed under CITES and on the IUCN Red List. Vanuatu has a National Plan of Action (NPOA) for sharks.

3.2.18 Inshore: Tafea Province: Erromango Island

3.2.18.1 SITE TAF4: ERROMANGO DOIT AND SIMPOMPOU

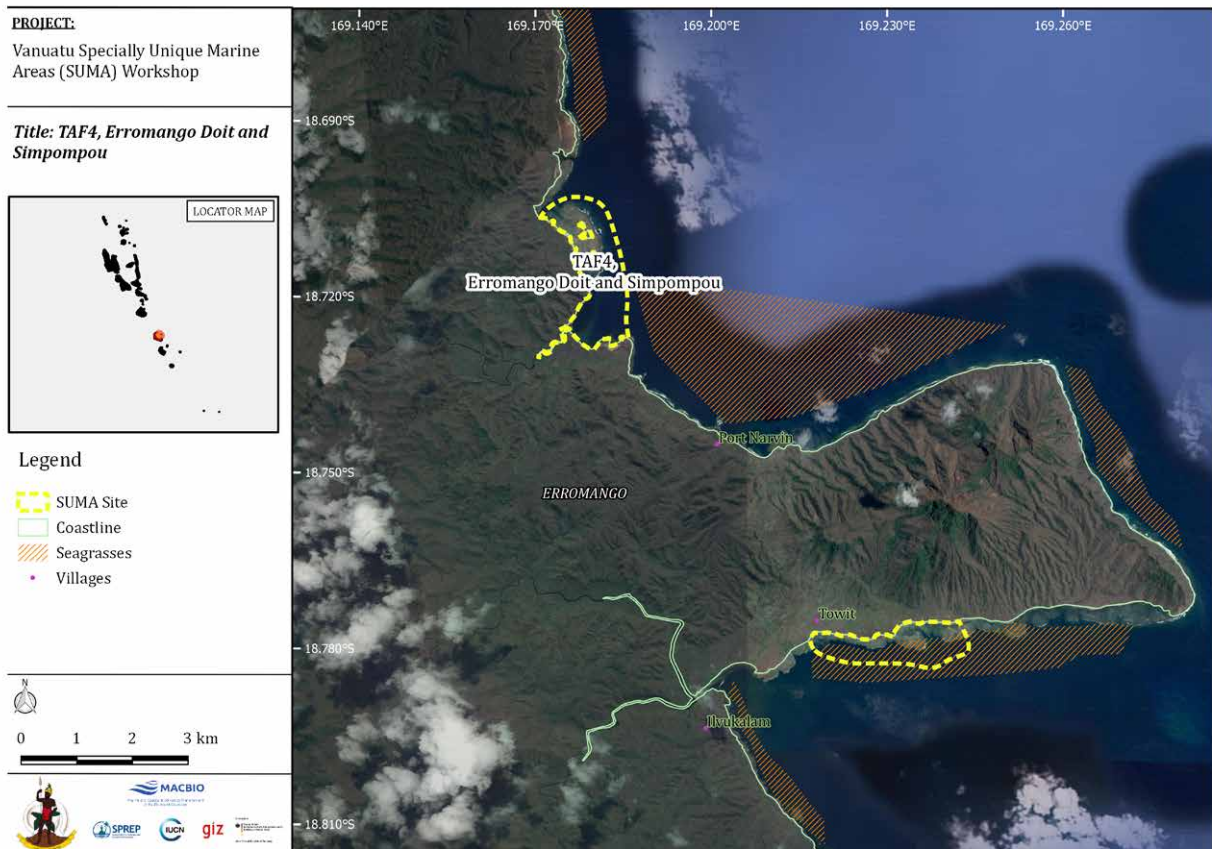


FIGURE 99. SITE TAF4: Erromango Doit and Simpompou

TABLE 105. SITE TAF4: Erromango Doit and Simpompou. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Tafea Province	Erromango Doit and Simpompou	TAF4	6.5

Geographic boundaries

18.7002°S 169.1777°E, 18.7955°S 169.2262°E

Geographic description (score = 2)

Erromango Island is the largest island in the Tafea Province, and the fourth largest island in the Vanuatu archipelago (892 km²). A large headland (the “Doit”) juts out from its eastern coast. This SUMA includes two areas: the southern one is a small expanse of shallow marine habitats on the southern side of the headland, and the northern one is on the east coast of Erromango Island to the north of the headland.

Justification (score = 1.5)

This SUMA was identified as a turtle nesting and reef fish breeding area. The Simpompou SUMA was identified by the NBSAP as being in need of protection for general marine resources, and Erromango in general was presented as important for the conservation of green, hawksbill and leatherback turtles (Government of Vanuatu 2016). Green and hawksbill turtles have been observed foraging in the vicinity of the general area of the SUMA (Siota 2015). Only subsistence level fishing takes place in Erromango, suggesting that stocks may be less depleted here (NAB 2016). Further information on turtles in Vanuatu generally was reviewed for Site Q1: Quanlap.

Type and number of sources (score = 1)

Three reports described the attributes of the SUMA on Erromango Island. Sources used for Site Q1: Quanlap are also relevant here.

Obligations (score = 2)

There are obligations to protect and sustainably manage species associated with coral reefs within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Mystery Island is a conservation area. Turtles and a large number of fishes and invertebrates associated with coral reefs are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Erromango Doit and Simpompou SUMA includes the Simpompou marine tabu/conservation sites, which are included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for formal protection.

3.2.19 Inshore: Tafea Province: Aniwa Island

3.2.19.1 SITE TAF5: ANIWA TIARO LAGOON

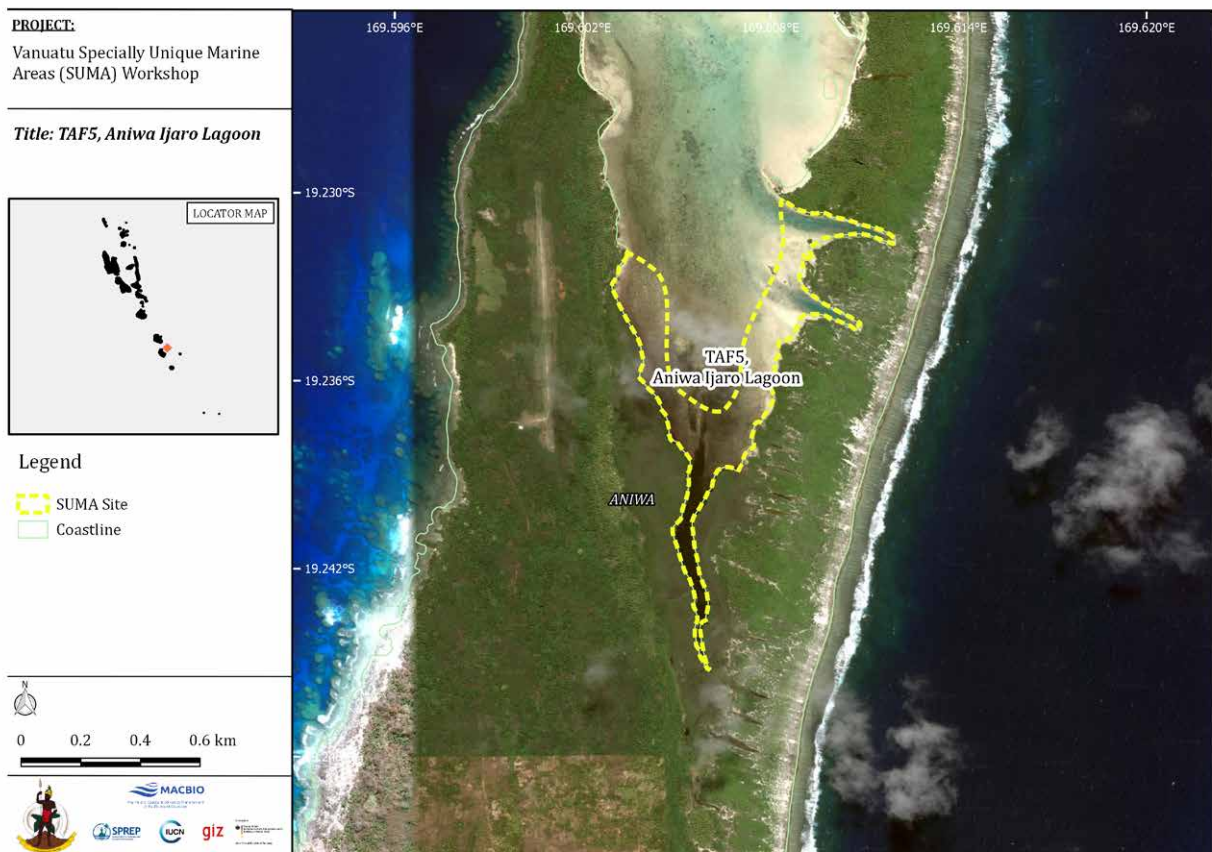


FIGURE 100. SITE TAF5: Aniwa Tiaro Lagoon

TABLE 106. SITE TAF5: Aniwa Tiaro Lagoon. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Tafea Province	Aniwa Tiaro Lagoon	TAF5	7

Geographic boundaries

19.2421°S 169.5989°E, 19.2314°S 169.6121°E

Geographic description (score = 3)

Aniwa is a small island in the province of Tafea. It rises 42 m above sea level, and in the northwest is Tiaro (also known as Itcharo) lagoon, which is open to the sea at the northern end. The SUMA is a small area around the southern reaches of the lagoon, approximately 1.3 km long.

Justification (score = 1)

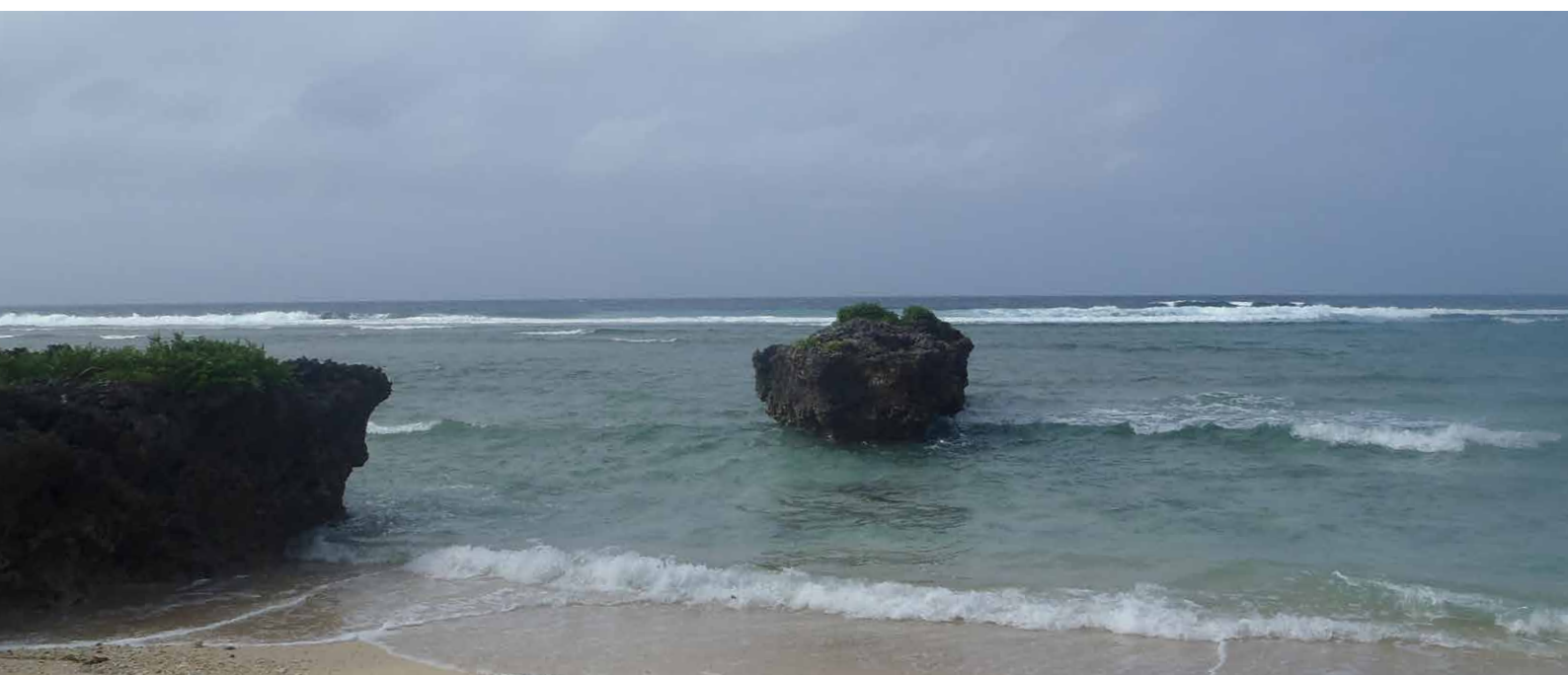
Aniwa Island has 15 ha of mangroves (Amos 2007; Kalfatak and Jaensch 2014), which are represented within this SUMA. The lagoon is one of the proposed marine protected areas on Aniwa Island (Government of Vanuatu 2016) for its role in providing a breeding habitat for marine organisms (see also Site M9: Lamango (Limbenwen)). Seagrass beds are also said to be present in the lagoon; green turtles have been recorded in the lagoon (Siota 2015), suggesting that food may be available there. Seagrass beds and mangroves are described more generally for Vanuatu in Site T4: Linua and Site Q1: Quanlap.

Type and number of sources (score = 1)

Three reports provided some information about Aniwa Island and the lagoon. Sources reviewed for Site T4: Linua, Site Q1: Quanlap and Site M9: Lamango (Limbenwen) are also relevant here.

Obligations (score = 2)

There are obligations to protect and sustainably manage species associated with seagrass beds and mangroves within the Environmental Protection and Conservation Act [CAP 283], the Fisheries Management Act 2014 and the Forestry Act 2001 [Cap 276]. Fishes and invertebrates associated with seagrass beds and mangroves are listed under CITES and on the IUCN Red List. The Aniwa Tiaro Lagoon SUMA includes the Aniwa Tiaro Lagoon marine tabu/conservation sites, which are included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for informal protection.



3.2.20 Inshore: Tafea Province: Futuna Island

3.2.20.1 SITE TAF6: FUTUNA MATANGI VILLAGE

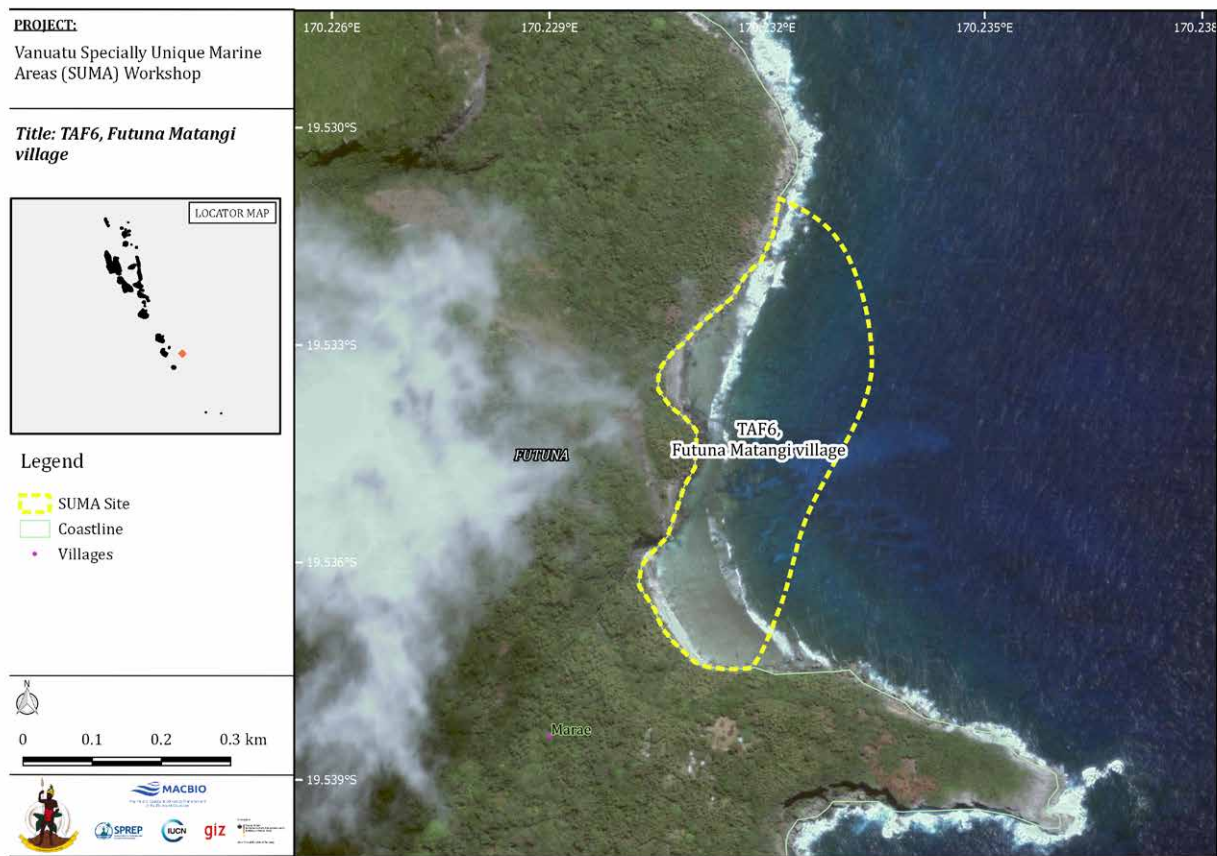


FIGURE 101. SITE TAF6: Futuna Matangi Village

TABLE 107. SITE TAF6: Futuna Matangi Village. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Tafea Province	Futuna Matangi Village	TAF6	6

Geographic boundaries

19.5366°S 170.2292°E, 19.5318°S 170.2342°E

Geographic description (score = 2)

Futuna Island is located in Tafea Province, and is the easternmost island in Vanuatu. Matangi Village is in the south of the island, and the SUMA is a small bay surrounded by cliffs, with a fringing coral reef. It extends along ~1 km of shoreline and 300 m out to sea.

Justification (score = 1)

Workshop participants identified this SUMA as a fringing coral reef and an important habitat for coconut crabs. The Tafea Province in general was recently identified as rich in coconut crabs, both Futuna and Erromango have been identified as having healthy populations of coconut crabs (Vanuatu Fisheries Department 2013a; Government of Vanuatu 2016). No other information was available about coral reefs or coconut crabs on Futuna Island, but these are described for Vanuatu in Site NO3: Vagtande Island and Site T1: Metoma Island.

Type and number of sources (score = 1)

Two reports provided information about coconut crabs on Futuna Island. General sources used for Site NO3: Vagtande Island and Site T1: Metoma Island are also relevant here.

Obligations (score = 2)

There are obligations for the management of coconut crabs under the Fisheries Management Act 2014 and the Coconut Crab Fisheries Management Plan 2013. The coconut crab is listed as Data Deficient on the IUCN Red List of Threatened Species. There are obligations to protect and sustainably manage species associated with coral reefs within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Fishes and invertebrates associated with coral reefs are listed under CITES and on the IUCN Red List.

3.2.21 Inshore: Tafea Province: Aneityum Island

3.2.21.1 SITE TAF7: MYSTERY ISLAND ANEITYUM

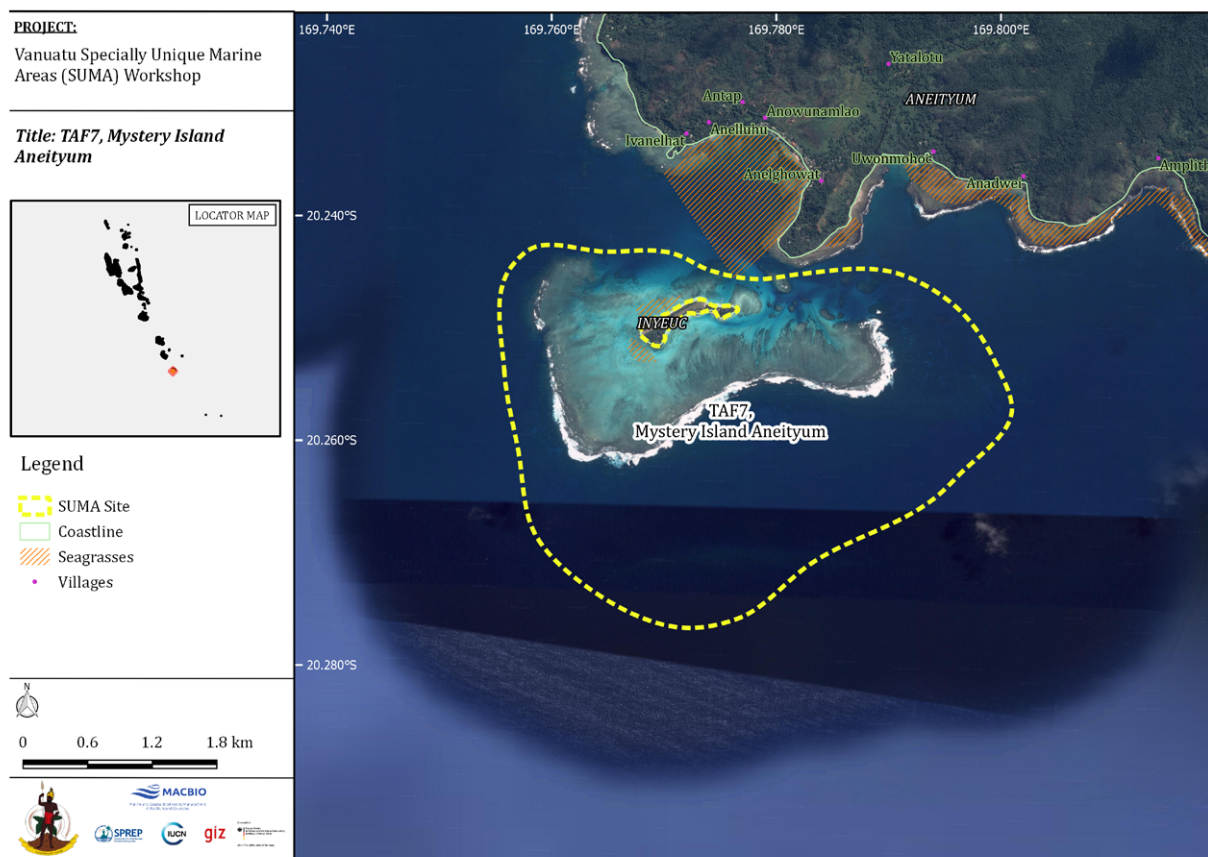


FIGURE 102. SITE TAF7: Mystery Island Aneityum

TABLE 108. SITE TAF7: Mystery Island Aneityum. Overall score (based upon information, below).

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore SUMA – Tafea Province	Mystery Island Aneityum	TAF7	11

Geographic boundaries

20.2420°S 169.7559°E, 20.2790°S 169.7991°E

Geographic description (score = 3)

Mystery Island is a small (700 by 150 m) islet off the southwestern corner of Aneityum Island in the Tafea Province of southern Vanuatu. The SUMA is an area approximately 3.5 km in diameter which includes the entire reef around the island and adjacent deeper waters.

Justification (score = 2.5)

Mystery Island has benefited from its status as a popular tourism destination, and has been protected from fishing. Therefore it has reefs in good condition (Done and Navin 1990), seagrass beds, turtles, populations of grazing fishes (e.g. parrotfishes) and a giant clam garden. There has been a measurable increase in populations of species usually exploited and an improvement in general reef condition since its protection (Chin et al. 2011). The NBSAP states that fishes and invertebrates are growing to larger sizes, and will help to restock other areas in the region (Government of Vanuatu 2016). Coral reef surveys estimated hard coral cover on Mystery Island at 25% (Vanuatu Reef Times 2005); this was higher than the ~19% reported from Aneityum Island overall (Raubani 2009; Chin et al. 2011). According to resource assessment surveys, Aneityum Island had the highest density of edible sea cucumbers across all locations surveyed in Vanuatu (Raubani 2009); it also had significant populations of *Tridacna maxima* and was one of the only areas with green snails present in the Province (Amos 2007). Aneityum also has been recorded to have seagrass beds with up to six species of seagrass (Chambers et al. 1990; Kalfatak and Jaensch 2014). Coral reefs, seagrass beds and turtles are described more generally for Vanuatu in Site NO3: Vagtande Island, Site T4: Linua and Site Q1: Quanlap.

Green and hawksbill turtles have been reported foraging around Mystery Island in large numbers; 115 green turtles were recorded between 1973 and 2015, which is the largest number for any location (Siota 2015). Leatherback turtles are also known from Aneityum Island, and potentially nest there (Amos 2007).

Type and number of sources (score = 2.5)

Three reports described the attributes of the Mystery Island SUMA, and a further five reports gave information about Aneityum Island more generally. Sources used for Site NO3: Vagtande Island, Site T4: Linua and Site Q1: Quanlap are also relevant here.

Obligations (score = 3)

There are obligations to protect and sustainably manage species associated with coral reefs and seagrass beds within the Environmental Protection and Conservation Act [CAP 283] and the Fisheries Management Act 2014. Mystery Island is a conservation area. Turtles and a large number of fishes and invertebrates associated with coral reefs, seagrass beds and mangroves are listed under CITES and on the IUCN Red List (green turtles are Endangered, hawksbill turtles are Critically Endangered, leatherback and loggerhead turtles are Vulnerable). Vanuatu has a National Plan of Action (NPOA) for all sea turtles. The Mystery Island Aneityum SUMA includes the Mystery Island marine tabu/conservation sites, which are included in the NBSAP (2018–2030) as a proposed marine conservation site as a national priority for formal protection.

4. DISCUSSION

Workshop participants identified 100 SUMAs, of which 11 were offshore and 89 were inshore sites. Sites identified by the expert workshop as SUMAs were given scores between 2.5 and 12 (Table 109). This scoring system is systematic, albeit subjective, and is designed to use as a guide for planning purposes. The final score for each site reflects the amount and type of knowledge available for that site, as well as the attributes of the site; lower-scoring sites may benefit from ground-truthing before definitive decisions are made about their protection or management. Because the highest scoring sites have a more robust information base, these areas can be prioritised with greater confidence during conservation or management planning across all sectors. However, the scoring system is based upon information available at the time of writing. As more information is gathered, or site attributes change with either protection or human influence, the “real” score of any site may change.

Vanuatu host a large number of SUMAs, and to some degree this is by virtue of its proximity to the Coral Triangle, the centre of the world’s marine biodiversity, and to some degree it is a function of the nomination of many small areas with remaining populations of an otherwise rare organism. Many sites therefore have relatively low scores. Furthermore, it was recognised that many inshore habitats in Vanuatu have been impacted by overexploitation.

Only one offshore site received the highest score of 12: the Vanuatu (previously New Hebrides) Trench (see list of scores in Table 109), because of a combination of recognised special, unique values of this trench in particular, and because, unusually, a number of studies have been conducted within its deeper reaches. This makes it unique, not just within Vanuatu, but globally. However, most offshore SUMAs received lower scores (between 5 and 10.5). Because of their large-scale and often offshore nature, the geographic boundaries of these sites were not exactly defined, and very little supporting information exists for many of them. A clear site boundary and good background information are important for spatial planning, especially in the case of marine areas where the features to be protected are usually hidden under the surface or determined by the movements or animals. The lowest-scoring sites (Eastern Vanuatu canyons, canyons east and north) suffered from a lack of information and clear boundaries, and it was therefore also difficult to determine obligations to protect attributes or components of these sites.

Among the finer-scale inshore sites, the five highest-scoring sites (12) were Palekula to Turtle Bay, Crab Bay, Lamén and Rovo Bays and Kakula (see list of scores in Table 109). This was the result of a combination of factors: they were geographically clearly defined, there was high-quality information directly relevant to the sites, and the attributes of the sites were clearly special. Most of them included a mosaic of habitats in close proximity that is well known to enhance marine biodiversity, connectivity, productivity and resilience. Most of these high-scoring sites have already been recognised for their special attributes through various forms of protection.

Low-scoring sites (4–5) were those that had been selected for a single specific organism or attribute, or those for which very little information was available. There are two sites that scored even lower (2.5); this was because they were selected for geophysical attributes for which there are no known obligations. This indicates that both high and low scores are useful for management; while high-scoring sites can be prioritised with confidence, lower-scoring sites can be highlighted for needing more research or requiring protection for the purposes of ecosystem recovery, or even restoration efforts.

Some of the sites were given a special and/or unique status because of their remoteness. This was partly because geographic isolation often leads to unique assemblages, genetic distinctness and the presence of endemics, and/or because the remoteness itself has left their ecosystems relatively intact. For instance, Vanuatu has abundant coral reefs, but a large number are heavily exploited, polluted, degraded, and/or have recently been afflicted by Crown-of-Thorns starfish (COTS) outbreaks. Others are relatively pristine because of their distance from human settlements. It is the reefs further offshore that are considered more special because the lack of exploitation and pollution makes them more diverse and resilient, with more abundant flora and fauna and intact food webs. Spatial planning can take this into account directly, but also in the context of connectivity, where intact coral reefs could act as sources of larvae to replenish degraded reefs; hydrodynamic modelling could help establish such linkages to further guide planning and management.

Given the status of coral reefs worldwide, and Vanuatu’s close proximity to the global epicentre of coral reef biodiversity, coral reefs identified in this report may well be special and/or unique at a regional level. Furthermore, many sites have three highly valuable ecosystems in close proximity (coral reefs, mangroves and seagrass beds), which, due to the number

of organisms that use all three habitats at different times in their life cycle, would confer a higher value to each individual habitat. Other sites include steep depth gradients that bring oceanic attributes close to productive coastal environments. This points to the importance of considering multiple adjacent habitats for inclusion in cohesive protected areas.

Future scoring systems could, more explicitly, take into account levels of human use or impact, as this affects the intrinsic ecological value of a habitat, assemblage, population or ecosystem. This intrinsic ecological value is embedded within the ability of the system to function in a balanced and sustainable manner. This includes elements of assemblage structure and diversity, nutrient cycling, trophic linkages and the abundance of keystone species. Sometimes a single species can indicate that these processes are likely to be intact. However, in the absence of existing information, only ground-truthing can confirm the special and/or unique nature of a site.

The identification and scoring of SUMAs can guide the next steps in marine spatial planning, but also provide a baseline of information for other management measures or environmental impact assessments that may be necessary in the future at these locations. Sites with higher scores can be seen as priority sites at a national level, while those with lower scores should be flagged for further research.

TABLE 109. Summary of special, unique marine areas, in order of decreasing score. Offshore and inshore sites are rated separately.

Region / Province	Site Code	Site Name	Geographic description	Justification	Sources	Obligations	Total Score
OFFSHORE							
Southern	SO4	Vanuatu Trench	3	3	3	3	12
Central	CO2	Central Vanuatu	3	2	2.5	3	10.5
Northern	NO2	East Epi	2.5	2	2	3	9.5
Northern	NO3	Vagtande Island	3	2	2.5	2	9.5
Southern	SO1	Futuna Trough	3	2.5	2	2	9.5
Southern	SO3	Hunter Island to northeast Erromango seamounts	1	2.5	3	3	9.5
Northern	NO1	Northwest part of Santo	1	2.5	2	3	8.5
Central	CO1	West Efate Island seamount	2	1	1.5	2	6.5
Central	CO3	Eastern Vanuatu canyons	1	1	2	2	6
Southern	SO5	Southernmost Vanuatu seamounts	1	2	2	1	6
Southern	SO2	East and northeast Erromango canyons	1	1	1	2	5
INSHORE							
Sanma	S1	Palekula to Turtle Bay	3	3	3	3	12
Malampa	M6	Crab Bay	3	3	3	3	12
Shefa	EP1	Lamen and Rovo Bays	3	3	3	3	12
Shefa	EF3	Kakula	3	3	3	3	12
Torba	Q1	Quanlap	3	2	3	3	11
Malampa	M10	Southeast Malekula	2	3	3	3	11
Tafea	TAF7	Mystery Island Aneityum	3	2.5	2.5	3	11
Malampa	M8	Port Stanley	3	2	2.5	3	10.5
Torba	T4	Linua	3	2	2	3	10
Sanma	S2	Hog Harbour and Port Orly Conservation Area	3	2	2	3	10
Sanma	S8	Malo Kilikili	3	2	2	3	10
Malampa	M3	Gaspard Bay dugong garden	2	3	2	3	10

Region / Province	Site Code	Site Name	Geographic description	Justification	Sources	Obligations	Total Score
Shefa	EF4	Marou Lagoon on Emau Island	3	2	2	3	10
Shefa	EF7	Havannah Harbour	3	2	2	3	10
Sanma	S3	Vathe-loathe Ureure	3	1.5	2	3	9.5
Shefa	EM2	Sulua Vaitini Siwo	2	2.5	2	3	9.5
Shefa	EF10	Eratap	2	2	2.5	3	9.5
Tafea	TAF1	Port Resolution	3	1.5	2	3	9.5
Penama	P6	Loltong Bay	3	2	2	2	9
Malampa	M1	Vulai Island	3	2	2	2	9
Malampa	M9	Lamango (Limbenwen)	3	1.5	1.5	3	9
Shefa	EP2	Ponkovia	2	2	2.5	2.5	9
Shefa	EP5	Moriu to Nuvi	2	2	2	3	9
Shefa	EM1	Cook Reef	3	2	3	1	9
Shefa	EM5	Siwo to Mbaleatong	2	2	2	3	9
Shefa	EF6	Pele Island (northeast)	2	2	2	3	9
Shefa	EF15	Port Vila Harbour	3	2	1	3	9
Shefa	EF17	Eretoka Island	3	1.5	1.5	3	9
Torba	T9	Mota Lava	2	2	2.5	2	8.5
Sanma	S6	Malo Pass	2	2	1.5	3	8.5
Shefa	TON2	Lupalea (Tongoa wall)	3	2	1.5	2	8.5
Shefa	MT1	Monument Rock	3	2	1.5	2	8.5
Shefa	EF11	Pango and Erakor	2	2	1.5	3	8.5
Shefa	EF12	Ekasuvat / Erakor 1st Lagoon	3	1.5	1	3	8.5
Torba	T8	Reef Islands	1	2	2	3	8
Sanma	S4	Kevin Anderson	2	1.5	1.5	3	8
Malampa	M5	Bamboo Bay and Dickson Reef	2	2	2	2	8
Shefa	EP4	Mavilao	2	2	2	2	8
Shefa	EM3	Makatea to Sagava	2	1.5	1.5	3	8
Shefa	EM4	Marae to Sauma	2	1.5	1.5	3	8
Shefa	EF24	Siviri	2	2	2	2	8
Penama	P7	Bay Homo	2	1	1.5	3	7.5
Shefa	TON1	Laika Island	3	1.5	1	2	7.5
Shefa	EF9	Eton	2	1.5	1	3	7.5
Shefa	EF13	Shark Bay to Erueti Island	2	2	1.5	2	7.5
Tafea	TAF2	White Grass	2	1.5	1	3	7.5
Shefa	EF18	Paul's Rock	2	1	1.5	3	7.5
Torba	T1	Metoma Island	3	1.5	1.5	1	7
Torba	T2	Tegua Island	2	2	2	1	7
Torba	T3	Hiu Island	2	2	2	1	7
Malampa	M2	Ringi Te Suh giant clams	2	2	2	1	7

Region / Province	Site Code	Site Name	Geographic description	Justification	Sources	Obligations	Total Score
Shefa	EM6	Naworalam	2	1	1	3	7
Shefa	EM7	Southeastern coast of Makira	2	1	1	3	7
Shefa	EF1	North Moso	3	1	2	1	7
Tafea	TAF5	Aniwa Tiaro Lagoon	3	1	1	2	7
Malampa	M7	Wiawi	2	1	2.5	1	6.5
Shefa	MT2	Siwo	2	1.5	1	2	6.5
Shefa	MT3	Mataso	1	2	1.5	2	6.5
Tafea	TAF4	Erromango Doit and Simpompou	2	1.5	1	2	6.5
Torba	T6	Aver	2	1	1	2	6
Sanma	S5	Lolitz-Pelmol Conservation	2	1	1	2	6
Penama	P2	South Maewo	3	1	1	1	6
Penama	P5	Devil's Rock	3	1	1	1	6
Malampa	M4	Arab Bridge	2	1	1	2	6
Shefa	EF8	Epau Village	2	1.5	1.5	1	6
Shefa	EF16	Hideaway Island	3	1	1	1	6
Tafea	TAF6	Futuna Matangi Village	2	1	1	2	6
Malampa	M12	North Ambrym	2	1	1.5	1	5.5
Shefa	EP3	Taliko	1	1	2.5	1	5.5
Tafea	TAF3	White Sands	2	1	0.5	2	5.5
Torba	T7	Divers' Bay	2	1	1	1	5
Malampa	M11	Maranatha	2	1	1	1	5
Malampa	M13	Northwest Ambrym	2	1	1	1	5
Shefa	EF2	Tukutuk	2	1	1	1	5
Shefa	EF5	Emau Island (East)	2	1	1	1	5
Shefa	EF14	Pango Point	2	1	1	1	5
Shefa	EF19	Scott Reef	1	1	1	2	5
Shefa	EF21	Southwest Pele Island	2	1	1	1	5
Shefa	EF22	Utanlang	2	1	1	1	5
Shefa	EF23	Northeast Nguna Island	2	1	1	1	5
Torba	T5	Black Rock, Toga Island	2	1	0.5	1	4.5
Penama	P4	Walurigi	2	1	0.5	1	4.5
Malampa	M14	Wailep	2	1	0.5	1	4.5
Shefa	TON3	Kurumambe	1	1.5	1	1	4.5
Shefa	TON4	Lupalea-Panita	2	1	0.5	1	4.5
Penama	P3	Northeast Maewo	2	0.5	0.5	1	4
Shefa	EF20	Eton Plateau	1	1	1	1	4
Penama	P1	Maewo Moon Cave	1	1	0.5	0	2.5
Penama	P8	Hot Wota	1	1	0.5	0	2.5

5. REFERENCES

- Abesamis RA, Green AL, Russ GR, Jadloc CRL (2014) The intrinsic vulnerability to fishing of coral reef fishes and their differential recovery in fishery closures. *Rev Fish Biol Fish* 24:1033–1063
- AIMS (2007) Shallow water fish surveys of the coral reefs of Vanuatu.
- Allen GR (2008) Conservation hotspots of biodiversity and endemism for Indo-Pacific coral reef fishes. *Aquat Conserv Mar Freshw Ecosyst* 18:541–556
- Alongi DM (2008) Mangrove forests: resilience, protection from tsunamis, and responses to global climate change. *Estuar Coast Shelf Sci* 76:1–13
- Amos MJ (2007) Vanuatu fishery resource profiles.
- AquaMaps (2014a) Vanuatu benthic marine species richness. Vanuatu Coastlines. <http://aquamaps.org/>
- AquaMaps (2014b) Vanuatu pelagic marine species richness. Vanuatu Coastlines. <http://aquamaps.org/>
- Ayre DJ, Hughes TP (2004) Climate change, genotypic diversity and gene flow in reef-building corals. *Ecol Lett* 7:272–278
- Baereleo R, Kalfatak D, Kanas T, Bulu M, Ham J, Kaltavara J, Sammy E, Dovo P, Duke N, MacKenzie J, Sheaves M, Johnston R, Yuen L (2013) Mangrove EcoSystems for Climate Change Adaptation and Livelihoods (MESCAL) biodiversity assessments technical report (Eratap and Amal/Crab Bay).
- Baillard C, Crawford WC, Ballu V, Régnier M, Pelletier B, Garaebiti E (2015) Seismicity and shallow slab geometry in the central Vanuatu subduction zone. *J Geophys Res Solid Earth* 120:5606–5623
- Baker E, Beaudoin Y (2013) Deep Sea Minerals: Cobalt-rich Ferromanganese Crusts, a physical, biological, environmental, and technical review. Vol. 1C.
- Ballu V, Bonnefond P, Calmant S, Bouin M-N, Pelletier B, Laurain O, Crawford WC, Baillard C, de Viron O (2013) Using altimetry and seafloor pressure data to estimate vertical deformation offshore: Vanuatu case study. *Adv Space Res* 51:1335–1351
- Barbier EB, Hacker SD, Kennedy C, Koch EW, Stier AC, Silliman BR (2011) The value of estuarine and coastal ecosystem services. *Ecol Monogr* 81:169–193
- Bell LAJ, Amos MJ (1993) Republic of Vanuatu fisheries resources profiles.
- Big Blue Vanuatu (2017) Big Blue SCUBA dive. <http://www.bigbluevanuatu.com/index.html>
- BirdLife International (2009) Designing networks of marine protected areas: exploring the linkages between Important Bird Areas and ecologically or biologically significant marine areas. BirdLife International, Cambridge
- BirdLife International (2018a) Vanuatu seaburds. <http://datazone.birdlife.org/species/results?cty=226&cri=&fam=0&gen=0&spc=&cmn=&bt=&rec=N&vag=N&stsea=Y&wat=&aze=>
- BirdLife International (2018b) Important Bird Areas factsheet: Île Matthew Marin. <http://www.birdlife.org>
- Blanc M (1988) Preliminary results of a deep-bottom fishing trial with “Z” traps in Vanuatu. *SPC Fish Newsl* 44:12–21
- Blue Habitats (2018) Vanuatu seamount pelagic zone classification. <http://www.bluehabitats.org>
- Bluhm H (2001) Re-establishment of an abyssal megabenthic community after experimental physical disturbance of the sea floor. *Deep Sea Res Part Oceanogr Res Pap* 48:3841–3868
- Borsa P (2007) Mission ornithologique aux îles Hunter et Matthew, 11–14 décembre 2004.
- Bouchet PJ, Le Guyader H, Pascal O (2011) The natural history of Santo.
- Bouchet PJ, Meeuwig JJ, Huang Z, Letessier TB, Nichol SL, Caley MJ, Watson R (2017) Continental-scale hotspots of pelagic fish abundance inferred from commercial catch records. *Glob Ecol Biogeogr* 26:1098–1111
- Bretagnolle V, Shirihai H (2010) A new taxon of Collared Petrel *Pterodroma brevipes* from the Banks Islands, Vanuatu. *Bull Br Ornithol Club* 130:286–301
- Brewer TD, Cinner JE, Green A, Pandolfi JM (2009) Thresholds and multiple scale interaction of environment, resource use, and market proximity on reef fishery resources in the Solomon Islands. *Biol Conserv* 142:1797–1807
- Brewer TD, Cinner JE, Green A, Pressey RL (2012) Effects of human population density and proximity to markets on coral reef fishes vulnerable to extinction by fishing. *Conserv Biol* 27:443–452
- Brouwer S, Pilling GM, Hampton J, Williams P, McKechnie S, Tremblay-Boyer L (2017) The Western and Central Pacific Tuna Fishery: 2016 Overview and status of stocks.
- Brown IW, Fielder DR (1991) The Coconut Crab: aspects of the biology and ecology of *Birgus latro* in the Republic of Vanuatu.
- Cabioch G, Banks-Cutler KA, Beck WJ, Burr GS, Corregge T, Edwards RL, Taylor FW (2003) Continuous reef growth during the last 23 cal kyr BP in a tectonically active zone (Vanuatu, SouthWest Pacific). *Quat Sci Rev* 22:1771–1786
- Cardno (2017) Final Initial Environmental Evaluation (IEE) of Eastern Subprojects. Cyclone Pam Road Reconstruction Project.
- Carter R (1990) Hydraulic and water quality studies, Erakor Lagoons and Port Vila Harbour, Vanuatu.
- Castelin M, Lorion J, Cruaud C, Maestrati P, Utge J, Samadi S (2012) Speciation patterns in gastropods with long-lived larvae from deep-sea seamounts. *Mol Ecol* 21:4828–4853
- Castelin M, Puillandre N, Lozouet P, Sysoev A, Richer de Forges B, Samadi S (2011) Molluskan species richness and endemism on New Caledonian seamounts: Are they enhanced compared to adjacent slopes? *Deep Sea Res Part Oceanogr Res Pap* 58:637–646

- Chadwick WW, Embley RW, Baker ET, Resing JA, Lupton JE, Cashman KV, Dziak RP, Tunnicliffe V, Butterfield DA, Tamura Y (2010) Northwest Rota-1 Seamount. *Oceanography* 23:182–183
- Chambers MR, Bani E, Barker-Hudson BET (1989) The status of the dugong (*Dugon dugon*) in Vanuatu.
- Chambers MR, Esrom D (1989) The status of the estuarine crocodile (*Crocodylus porosus* Schneider 1801) in Vanuatu.
- Chambers MR, Nguyen F, Navin KF (1990) Seagrass communities.
- Cheal AJ, MacNeil MA, Cripps E, Emslie MJ, Jonker M, Schaffelke B, Sweatman H (2010a) Coral–macroalgal phase shifts or reef resilience: links with diversity and functional roles of herbivorous fishes on the Great Barrier Reef. *Coral Reefs* 29:1005–1015
- Cheal AJ, MacNeil MA, Cripps E, Emslie MJ, Jonker M, Schaffelke B, Sweatman H (2010b) Coral–macroalgal phase shifts or reef resilience: links with diversity and functional roles of herbivorous fishes on the Great Barrier Reef. *Coral Reefs* 29:1005–1015
- Chin A, De Loma TL, Reyta K, Planes S, Gerhardt K, Clua E, Burke L, Wilkinson C (2011) Status of coral reefs of the Pacific and outlook: 2011.
- Cillauren E, David G, Grandperrin R (2002) Coastal fisheries atlas of Vanuatu – Vanuatu Island fisheries.
- Cinner JE, McClanahan TR, Graham NAJ, Pratchett MS, Wilson SK, Raina J-B (2009) Gear-based fisheries management as a potential adaptive response to climate change and coral mortality. *J Appl Ecol* 46:724–732
- Clark MR, Roberts C, Williams A, Last P (2003) Voyage report of a biodiversity survey of seamounts and slopes of the Norfolk Ridge and Lord Howe Rise (Norfanz), May–June 2003.
- Clark MR, Watling L, Rowden AA, Guinotte JM, Smith CR (2011) A global seamount classification to aid the scientific design of marine protected area networks. *Ocean Coast Manag* 54:19–36
- Cleguer C, Garrigue C, Fuentes MMPB, Everingham Y, Hagihara R, Hamann M, Payri FCE, Marsh H (2017) Drivers of change in the relative abundance of dugongs in New Caledonia. *Wildl Res* 44:365–276
- CMEMS (2015) Republic of Vanuatu downwelling eddy frequency. <http://marine.copernicus.eu/>
- Collette BB, Carpenter KE, Polidoro BA, Juan-Jorda MJ, Boustany A, Die DJ, Elfes C, Fox W, Graves J, Harrison LR, McManus R, Minte-Vera CV, Nelson R, Restrepo V, Schratwieser J, Sun C-L, Amorim A, Brick Peres M, Canales C, Cardenas G, Chang S-K, Chiang W-C, De Oliveira Leite NJ, Harwell H, Lessa R, Fredou FL, Oxenford HA, Serra R, Shao K-T, Sumaila R, Wang S-P, Watson R, Yanez E (2011) High value and long life— double jeopardy for tunas and billfishes. *Science* 333:291–292
- Collet J-Y, Fisher MA (1992) The D'Entrecasteaux Zone – New Hebrides island arc collision zone: An overview. 134:19–31
- Collet J-Y, Lallemand S, Pelletier B, Eissen J-P, Glaçon G, Fisher MA, Greene HG, Boulin J, Daniel J, Monzier M (1992) Geology of the d'Entrecasteaux-New Hebrides Arc collision zone: results from a deep submersible survey. *Tectonophysics* 212:213–241
- Conant TA, Dutton PH, Eguchi T, Epperly SP, Fahy CC, Godfrey MH, MacPherson SL, Possardt EE, Schroeder BA, Seminoff JA, Snover ML (2009) Loggerhead sea turtle (*Caretta caretta*) 2009 status review under the U.S. Endangered Species Act.
- Corbara B (2009) Editorial. SANTO 2006, new taxa from the bottom of the sea. *Zoosystema* 31:397–400
- Coward G, Leger C, Myrmo M (2014) OceansWatch Project Report: Southwest Bay, Malekula. July 13–July 25 2014.
- CSIRO (2008) <http://www.cmar.csiro.au/publications/facts/anfc/anfc.html#reports> from an expedition Accessed 11 Jan 2017.
- CSIRO (2009a) Vanuatu frontal index. <https://researchdata.andcs.org.au/csiro-atlas-regional-cars-2009/15210>
- CSIRO (2009b) Republic of Vanuatu phosphate concentration. <https://researchdata.andcs.org.au/csiro-atlas-regional-cars-2009/15210>
- CSIRO (2009c) Republic of Vanuatu nitrate concentration. <https://researchdata.andcs.org.au/csiro-atlas-regional-cars-2009/15210>
- Davey FJ (1982) The structure of the South Fiji Basin. In G.H. Packham (Editor), *The Evolution of the India-Pacific Plate Boundaries*. *Tectonophysics* 87:185–241
- De Leo FC, Smith CR, Rowden AA, Bowden DA, Clark MR (2010) Submarine canyons: hotspots of benthic biomass and productivity in the deep sea. *Proc R Soc B Biol Sci* 277:2783–2792
- Demopoulos AWJ, McClain-Counts J, Ross SW, Brooke S, Mienis F (2017) Food-web dynamics and isotopic niches in deep-sea communities residing in a submarine canyon and on the adjacent open slopes. *Mar Ecol Prog Ser* 578:19–33
- Department of Lands, IUCN, BirdLife International (2011) Republic of Vanuatu Islands and Key Biodiversity Areas (KBAs), Ecologically and Biologically Significant Areas (EBSAs), Important Bird Areas (IBAs).
- DEPC (2011) Republic of Vanuatu: Port Vila Urban Development Project.
- Derville S, Torres LG, Garrigue C (2018) Social segregation of humpback whales in contrasted coastal and oceanic breeding habitats. *J Mammal* 99:41–54
- Domeier ML, Colin PL (1997) Tropical reef fish spawning aggregations: defined and reviewed. *Bull Mar Sci* 60:698–726
- Domeier ML, Speare P (2012) Dispersal of adult black marlin (*Istiompax indica*) from a Great Barrier Reef spawning aggregation. *PLoS ONE* 7(2):e31629. doi:10.1371/journal.pone.0031629
- Done TJ, Navin KF (1990) Vanuatu Marine Resources: Report of a biological survey.
- Dubois J, Launay J, Recy J, Marshall J (1977) New Hebrides trench: subduction rate from associated lithospheric bulge. *Can J Earth Sci* 14:250–255
- Dumas P, Ham J, Amos G, Moutardier G (2014) Community-based management of crowns-of-thorns in Emae, Vanuatu. MANAO project, site report.
- Dumas P, Jayven H (2015) Macroinvertebrates & habitat survey in Crab Bay, Malekula (Vanuatu).
- Dumas P, Léopold M, Kaltavara J, William A, Kaku R, Ham J (2012) Efficiency of tabu areas in Vanuatu (EFITAV project).

- Dunstan P, Clark M, Guinotte J, O'Hara T, Niklitschek, Rowden A, Schlacher T, Tsuchida S, Watling L, Williams A (2011) Identifying Ecologically and Biologically Significant Areas on Seamounts. 14
- Durance PMJ, Jadamec MA, Falloon TJ, Nicholls IA (2012) Magmagenesis within the Hunter Ridge Rift Zone resolved from olivine-hosted melt inclusions and geochemical modelling with insights from geodynamic models. *Aust J Earth Sci* 59:913–931
- Dutson G (2011) *Birds of Melanesia: Bismarcks, Solomons, Vanuatu and New Caledonia*. Christopher Helm, London
- Dutton PH, Hitipeuw C, Zein M, Benson SR, Petro G, Pita J, Rei V, Ambio L, Bakarbesy J (2007) Status and genetic structure of nesting populations of leatherback turtles (*Dermodochelys coriacea*) in the western Pacific. *Chelonian Conserv Biol* 6:47–53
- Edney G, Feduniw S, Haissoune-Bedard A (2013) OceansWatch Project Report, Ra and Mota Lava Islands, Torba Province. 4th September – 22 September 2013.
- Ellison JC (2009) Wetlands of the Pacific Island region. *Wetl Ecol Manag* 17:169–206
- Embley RW, Merle SG, Baker ET, Rubin KH, Lupton JE, Resing JA, Dziak RP, Lilley MD, Chadwick WW, Shank T, Greene R, Walker SL, Haxel J, Olson E, Baumberger T (2014) Eruptive modes and hiatus of volcanism at West Mata seamount, NE Lau basin: 1996–2012. *Geochem Geophys Geosystems* 15:4093–4115
- EnezGreen (2016) The world famous Tongoa Wall. <http://www.enezgreen.com/en/content/world-famous-tongoa-wall>
- Estes JA, Terborgh J, Brashares JS, Power ME, Berger J, Bond WJ, Carpenter SR, Essington TE, Holt RD, Jackson JBC, Marquis RJ, Oksanen L, Oksanen T, Paine RT, Pritchard EK, Ripple WJ, Sandin SA, Scheffer M, Schoener TW, Shurin JB, Sinclair ARE, Soule ME, Virtanen R, Wardle DA (2011) Trophic downgrading of planet earth. *Science* 333:301–306
- Evans LJ, Jones H, Pang K, Saimin S, Goossens B (2016) Spatial ecology of estuarine crocodile (*Crocodylus porosus*) nesting in a fragmented landscape. *Sensors* 16:1527; doi:10.3390/s16091527
- FAO (2018) Progress made to establish conservation area in Vanuatu. <http://www.fao.org/asiapacific/news/detail-events/en/c/296534/>
- Fernandez-Arcaya U, Ramirez-Llodra E, Aguzzi J, Allcock AL, Davies JS, Dissanyake A, Harris PT, Howell K, Huvenne VAI, Macmillan-Lawler M, Martín J, Menot L, Nizinski M, Puig P, Rowden AA, Sanchez F, Van den Beld IMJ (2017) Ecological role of submarine canyons and need for canyon conservation: A review. *Front Mar Sci* 4:doi: 10.3389/fmars.2017.00005
- Ferrigno F, Bianchi CN, Lasagna R, Morri C, Russo GF, Sandulli R (2016) Corals in high diversity reefs resist human impact. *Ecol Indic* 70:106–113
- Fisher MA, Collot J-Y, Geist EL (1991) Structure of the collision zone between Bougainville Guyot and the accretionary wedge of the New Hebrides island arc, southwest Pacific. *Tectonics* 10:887–903
- Friedlander AM, DeMartini EE (2002) Contrasts in density, size, and biomass of reef fishes between the northwestern and the main Hawaiian Islands: the effects of fishing down apex predators. *Mar Ecol Prog Ser* 230:253–264
- Friedman K, Eriksson H, Tardy E, Pakoa K (2011) Management of sea cucumber stocks: patterns of vulnerability and recovery of sea cucumber stocks impacted by fishing. *Fish Fish* 12:75–93
- Friedman K, Pakoa K, Kronen M, Chapman L, Sauni S, Vigliola L, Boblin P, Magron F (2008) Vanuatu country report: Profiles and results from survey work at Paunangisu Village, Moso Island, Uri and Uripiv Islands and the Maskelyne Archipelago.
- Futura Sciences (2015) Epi B, l'un des volcans sous-marins les plus actifs de l'archipel. <https://www.futura-sciences.com/planete/dossiers/voyage-vanuatu-iles-cendre-corail-473/page/8/>
- Galindo LA, Kool HH, Dekker H (2017) Review of the *Nassarius pauperus* (Gould, 1850) complex (Nassariidae). Part 3, reinstatement of the genus *Reticunassa*, with the description of six new species. *Eur J Taxon* 275:1–43
- Garrigue C, Clapham PJ, Geyer Y, Kennedy AS, Zerbini AN (2015) Satellite tracking reveals novel migratory patterns and the importance of seamounts for endangered South Pacific humpback whales. *R Soc Open Sci* 2:150489
- Garrigue C, Zerbini AN, Geyer Y, Heide-Jørgensen M-P, Hanaoka W, Clapham P (2010) Movements of satellite-monitored humpback whales from New Caledonia. *J Mammal* 91:109–115
- GEF-UNEP-CMS (2016) The Dugong and Seagrass Conservation Project. <http://www.dugongconservation.org/where-we-work/vanuatu/>
- Genin A (2004) Bio-physical coupling in the formation of zooplankton and fish aggregations over abrupt topographies. *J Mar Syst* 50:3–20
- Giesen W, King K (1997) Incremental costs of wetland conservation.
- Global Volcanism Program (2004) Report on Epi (Vanuatu). In: Venzke, E (ed.), *Bulletin of the Global Volcanism Network*, 29:4.
- Gollner S, Govenar B, Fisher CR, Bright M (2015) Size matters at deep-sea hydrothermal vents: different diversity and habitat fidelity patterns of meio- and macrofauna. *Mar Ecol Prog Ser* 520:57–66
- Gollner S, Kaiser S, Menzel L, Jones DOB, Brown A, Mestre NC, van Oevelen D, Menot L, Colaço A, Canals M, Cuvelier D, Durden JM, Gebruk A, Eggho GA, Haeckel M, Marcon Y, Mevenkamp L, Morato T, Pham CK, Purser A, Sanchez-Vidal A, Vanreusel A, Vink A, Arbizu PM (2017) Resilience of benthic deep-sea fauna to mining activities. *Mar Environ Res* 129:76–101
- Gomez C, Williams AJ, Nicol SJ, Mellin C, Loeun KL, Bradshaw CJA (2015) Species distribution models of tropical deep-sea snappers. *PLoS ONE* 10 (6):e0127395. doi:10.1371/journal.pone.0127395
- Gorman MK, Quinn TM, Taylor FW, Partin JW, Cabioch G, Austin Jr. JA, Pelletier B, Ballu V, Maes C, Sastrup S (2012) A coral-based reconstruction of sea surface salinity at Sabine Bank, Vanuatu from 1842 to 2007 CE. *Paleoceanography* 27:PA3226, doi:10.1029/2012PA002302
- Government of Vanuatu (2008) Millennium Challenge Account: Vanuatu. Environmental Social Assessment and Environmental Management Plan: Efate Ring Road Subproject MCA02.

- Government of Vanuatu (2016) National Biodiversity Strategy and Action Plan.
- Graham NAJ, Jennings S, MacNeil MA, Mouillot D, Wilson SK (2015) Predicting climate-driven regime shifts versus rebound potential in coral reefs. *Nature* 518:94–97
- Graham NAJ, Spalding MD, Sheppard CRC (2010) Reef shark declines in remote atolls highlight the need for multi-faceted conservation action. *Aquat Conserv* 20:543–548
- Greene HG, Exon NF (1988) Acoustic stratigraphy and hydrothermal activity within Epi Submarine Caldera, Vanuatu, New Hebrides Arc. *Geo-Mar Lett* 8:121–129
- Guerra M, Hickmott L, van der Hoop J, Rayment W, Leunissen E, Slooten E (2017) Diverse foraging strategies by a marine top predator: Sperm whales exploit pelagic and demersal habitats in the Kaikōura submarine canyon. *Deep Sea Res Part Oceanogr Res Pap* 128:98–108
- Ham J, Kaku R, Leopold M (2014) Sea cucumber stock assessment report, south Efate 2013.
- Ham J, Kaltavara J (2010) A preliminary wreckage assessment of MV Percy Jean, Lenakel, Tanna. October 27th and 28th, 2010.
- Hanson JO, Salisbury SW, Campbell HA, Dwyer RG, Jardine TD, Franklin CE (2015) Feeding across the food web: The interaction between diet, movement and body size in estuarine crocodiles (*Crocodylus porosus*). *Austral Ecol* 40:275–286
- Hanuš V, Vaněk J (1983) Deep structure of the Vanuatu (New Hebrides) island arc: Intermediate depth collision of subducted lithospheric plates. *N Z J Geol Geophys* 26:133–154
- Harris PT (2014) Shelf and deep-sea sedimentary environments and physical benthic disturbance regimes: a review and synthesis. *Mar Geol* 353:169–184
- Harris PT, Macmillan-Lawler M, Rupp J, Baker EK (2014) Geomorphology of the Oceans. *Mar Geol* 352:4–24
- Harris PT, Whiteway T (2011) Global distribution of large submarine canyons: geomorphic differences between active and passive continental margins. *Mar Geol* 285:69–86
- Hawkes JA, Rossel PE, Stubbins A, Koschinsky A, Chavagnac V, Hansen CT, Bach W, Dittmar T (2015) Efficient removal of recalcitrant deep-ocean dissolved organic matter during hydrothermal circulation. *Nat Geosci* 8:856–860
- Hickey FR (2006) Amal / Crab Bay Tabu Eria review, Malekula Island, Vanuatu.
- Hickey FR (2007) Marine ecological baseline report for Amal / Crab Bay Tabu Eria, Malekula Island, Vanuatu.
- Hill J (2004) Reef Check Vanuatu report, July-August 2004.
- Hisano M, Connolly SR, Robbins WD (2011) Population growth rates of reef sharks with and without fishing on the Great Barrier Reef: robust estimation with multiple models. *PLoS ONE* 6:e25028. doi:10.1371/journal.pone.0025028
- Hobbs J-PA, van Herwerden L, Jerry DR, Jones GP, Munday PL (2013) High genetic diversity in geographically remote populations of endemic and widespread coral reef angelfishes (genus: *Centropyge*). *Diversity* 5:39–50
- Holbrook SJ, Schmitt RJ, Adam TC, Brooks AJ (2016a) Coral reef resilience, tipping points and the strength of herbivory. *Sci Rep* 6:35817 | DOI: 10.1038/srep35817:
- Holbrook SJ, Schmitt RJ, Adam TC, Brooks AJ (2016b) Coral reef resilience, tipping points and the strength of herbivory. *Sci Rep* 6:35817 | DOI: 10.1038/srep35817:
- Holden BJ (1992) Mele Bay and Erakor Lagoon, Vanuatu.
- Hooker SK, Whitehead H, Shannon G (1999) Marine protected area design and the spatial and temporal distribution of cetaceans in a submarine canyon. *Conserv Biol* 13:592–602
- Hooper E, Costello D, Darby C, Jimenez I (2016) Marine report: Dolav, Ontar and Qetegaveg, Gaua.
- Hooper JNA, Kennedy JA, Quinn RJ (2002) Biodiversity ‘hotspots’, patterns of richness and endemism, and taxonomic affinities of tropical Australian sponges (Porifera). *Biodivers Conserv* 11:851–885
- Houk P, Raubani J (2010) *Acanthaster planci* outbreaks in Vanuatu coincide with ocean productivity, furthering trends throughout the Pacific Ocean. *J Oceanogr* 66:435–438
- Hughes A (2006) Benthic communities. In: Green, A., P. Lokani, W. Atu, P. Ramohia, P. Thomas and J. Almany (eds) Solomon Islands Marine Assessment: Technical report of survey conducted May 13 to June 17, 2004. TNC Pacific Island Countries Report No 1/06. The Nature Conservancy, Brisbane,
- Hughes TP, Bellwood DR, Connolly SR (2002) Biodiversity hotspots, centres of endemism, and the conservation of coral reefs. *Ecol Lett* 5:775–784
- Ifira Marine Management Team (2017) Ifira Marine Management Plan.
- IHO (2008) Standardization of Undersea Feature Names: Guidelines Proposal form Terminology.
- Izasa K, Kawasaki K, Maeda K, Matsumoto T, Hirai K (1998) Hydrothermal sulfide-bearing Fe-Si oxyhydroxide deposits from the Coriolis Troughs, Vanuatu backarc, southwestern Pacific. *Mar Geol* 145:1–21
- ISA (1999) Deep-seabed polymetallic nodule exploration: Development of environmental guidelines.
- Island Life (2015) Turtle time. <http://www.islandlifemag.com/island-life-magazine/turtle-time/>
- Johannes RE, Hickey FR (2004) Evolution of village-based marine resource management in Vanuatu between 1993 and 2001. *Coastal regions and small island papers* 15.
- Johnson J, Hooper E, Waterhouse J, Dwyer S (2017) Republic of Vanuatu. In: Global Coral Reef Monitoring Network. Status of coral reefs in the Pacific. Global Coral Reef Monitoring Network, Townsville, Australia,
- Johnson J, Waterhouse J, Devlin M, Hooper E (2016) Marine ecosystem assessment, north Efate, Vanuatu.
- Kalfatak D, Jaensch R (2014) Directory of Wetlands of Vanuatu.
- Kaneko T, Maejima Y, Teishima A (1997) The abundance and vertical distribution of abyssal benthic fauna in the Japan Deep-Sea Impact Experiment. The Seventh International Offshore and Polar Engineering Conference
- King MG (1981) Deepwater shrimp resources in Vanuatu: a preliminary survey off Port Vila. *Mar Fish Rev* 43:10–17
- Klint LM, Calgano E, Jiang M, Law A, DeLacy T (2017) Pacific tourism climate adaptation project. V/R assessment, Republic of Vanuatu.

- Klose J, Polz MF, Wagner M, Schimak MP, Gollner S, Bright S (2015) Endosymbionts escape dead hydrothermal vent tubeworms to enrich the free-living population. *Proc Natl Acad Sci U S A* 112:11300–11305
- Komatsu H, Ng PKL (2011) *Kabutos*, a new genus for the western Pacific leucosiid crab, *Merocryptus durandi* Serène, 1955 (Crustacea: Decapoda: Brachyura). *Zootaxa* 2881:31–38
- Lacey NC, Rowden AA, Clark MR, Kilgallen NM, Mayor DJ, Jamieson AJ (2016) Community structure and diversity of scavenging amphipods from bathyal to hadal depths in three South Pacific Trenches. *Deep Sea Res Part Oceanogr Res Pap* 111:121–137
- Laverick JH, Rogers AD (2018) Experimental evidence for reduced mortality of *Agaricia lamarcki* on a mesophotic reef. *Mar Environ Res* 134:37–43
- Le Poidevin C, Hooper E, Jagerroos S (2015) OceansWatch Vanuatu Expedition 2015. Marine, sustainable livelihood & education programs in northern Vanuatu.
- Léopold M, Chateau O, Gabriault H, Ham J, Andréfouët S, Raubani J, Dumas P (2017) Fish movements within community-managed fishery reserve networks: an acoustic survey of *Lethrinus harak* in Vanuatu. *Mar Ecol Prog Ser* 571:153–168
- Lévy-Hartmann L, Roussel V, Letourneur Y, Sellos DY (2011) Global and New Caledonian patterns of population genetic variation in the deep-sea splendid alfonso, *Beryx splendens*, inferred from mtDNA. *Genetica* 139:1349–1365
- Liao J-X, Chen G-M, Chiou M-D, Jan S, Wei C-L (2017) Internal tides affect benthic community structure in an energetic submarine canyon off SW Taiwan. *Deep Sea Res Part Oceanogr Res Pap* 125:147–160
- Linley TD, Gerringer ME, Yancey PH, Drazen JC, Weinstock CL, Jamieson AJ (2016) Fishes of the hadal zone including new species, in situ observations and depth records of Liparidae. *Deep Sea Res Part Oceanogr Res Pap* 114:99–110
- Linley TD, Stewart AL, McMillan PJ, Clark MR, Gerringer ME, Drazen JC, Fujii T, Jamieson AJ (2017) Bait attending fishes of the abyssal zone and hadal boundary: Community structure, functional groups and species distribution in the Kermadec, New Hebrides and Mariana trenches. *Deep Sea Res Part Oceanogr Res Pap* 121:38–53
- Little CTS, Vrijenhoek RC (2003) Are hydrothermal vent animals living fossils? *Trends Ecol Evol* 18:582–588
- Luschi L (2013) Long-distance animal migrations in the oceanic environment: orientation and navigation correlates. *Int Sch Res Not – Zool Artic* ID 631839 23 Pages 2013 Doi1011552013631839
- Maison KA, Kinan-Kelly I, Fruchter KP (2010) Green turtle nesting sites and sea turtle legislation throughout Oceania.
- Malampa Travel (2017) Gaspard Bay dugong tour. <http://www.malekula.travel/gaspard-bay-dugong-tour.html>
- Marchese C (2014) Biodiversity hotspots: A shortcut for a more complicated concept. *Global Ecology and Conservation. Glob Ecol Conserv* 3:297–309
- Marsh H, O'Shea TJ, Reynolds III JE (2012) *Ecology and conservation of the Sirenia: dugongs and manatees*. Cambridge University Press, Cambridge, UK
- Marsh H, Sobotzick S (2015) Dugong dugon The IUCN Red List of Threatened Species 2015: e.T6909A43792211. <http://www.iucnredlist.org/pdf/ink.43792211>
- McConachy T, Binns RA (2001) Seafloor hydrothermal activity in arc and backarc settings, Vanuatu, SW Pacific. *Cruise Summary, RV Franklin FR 08/01*.
- McConachy TF, Arculus RJ, Yeats CJ, Binns RA, Barriga FJAS, McInnes BIA, Sestak S, Sharpe R, Rakau B, Tevi T (2005) New hydrothermal activity and alkalic volcanism in the backarc Coriolis Troughs, Vanuatu. *Geology* 33:61–64
- McDevitt-Irwin JM, Iacarella JC, Baum JK (2016) Reassessing the nursery role of seagrass habitats from temperate to tropical regions: a meta-analysis. *Mar Ecol Prog Ser* 557:133–143
- McEvoy D, de Ville A, Komugabe-Dixson A, Trundle A (2016) Greater Port Vila: Ecosystem and socio-economic resilience analysis and mapping (ESRAM). Technical Summary, November 2016.
- McLean M, Cuentos-Bueno J, Nedlic O, Luckymiss M, Houk P (2016) Local stressors, resilience, and shifting baselines on coral reefs. *PLoS ONE* 11:e0166319. doi:10.1371/journal.pone.0166319
- MESCAL (2013) MangroveWatch assessment of shoreline mangroves in Vanuatu.
- Messel H, King FW (1992) Survey and plan for recovery of the crocodile population of the Republic of Vanuatu, Southwestern Pacific Ocean.
- Miller C (2007) Current state of knowledge of cetacean threats, diversity and habitats in the Pacific Islands region.
- Miller JD, Dobbs KA, Limpus CJ, Mattocks N, Landry AM (1998) Long-distance migrations by the hawksbill turtle, *Eretmochelys imbricata*, from north-eastern Australia. *Wildl Res* 89–95
- Monzier M, Danyushevsky LV, Crawford AJ, Bellon H, Cotten J (1993) High-Mg andesites from the southern termination of the New Hebrides island arc (SW Pacific). *J Volcanol Geotherm Res* 57:193–217
- Monzier M, Robin C, Eissen J-P (1994) Kuwae (~1425 A.D.): the forgotten caldera. *J Volcanol Geotherm Res* 59:207–218
- Moors-Murphy HB (2014) Submarine canyons as important habitat for cetaceans, with special reference to the gully: A review. *Deep Sea Res Part II Top Stud Oceanogr* 104:6–19
- Morato T, Clark MR (2007) Seamount fishes: ecology and life histories. In T. J. Pitcher et al., eds. *Seamounts: ecology, fisheries and conservation*: Blackwell Fisheries and Aquatic Resources Series, 12. Oxford: Blackwell Publishing, pp. 170–188.
- Morato T, Hoyle SD, Allain V, Nicol SJ (2010) Seamounts are hotspots of pelagic biodiversity in the open ocean. *Proc Natl Acad Sci* 107:9707–9711
- Morelle R (2014) New Hebrides Trench: first look at unexplored deep sea. <http://www.bbc.com/news/science-environment-26373896>
- Mortimer N, Gans PB, Palin JM, Herzer RH, Pelletier B, Monzier M (2014) Eocene and Oligocene basins and ridges of the Coral Sea-New Caledonia region: Tectonic link between Melanesia, Fiji, and Zealandia. *Tectonics* 33:1386–1407

- Mumby PJ, Edwards AJ, Arias-Gonzalez JE, Lindeman KC, Blackwell PG, Gall A, Gorczynska MI, Harborne AR, Perscod CL, Renken H, Wabnitz CCC, Llewellyn G (2004) Mangroves enhance the biomass of coral reef fish communities in the Caribbean. *Nature* 427:533–536
- Muñoz M, Reul A, Vargas-Yáñez M, Plaza F, Bautista B, García-Martínez MC, Moya F, Gómez-Moreno M-L, Fernandes JA, Rodríguez V (2017) Fertilization and connectivity in the Garrucha Canyon (SE-Spain) implications for Marine Spatial Planning. *Mar Environ Res* 126:45–68
- Myers RA, Worm B (2003) Rapid worldwide depletion of predatory fish communities. *Nature* 423:280–283
- NAB (2016) V-CAP Site: Aniwa, Futuna, Aneityum & Erromango Islands; Outer Islands of Tafea Province.
- NASA (2018a) Republic of Vanuatu photosynthetically available radiation. <https://oceancolor.gsfc.nasa.gov/data/aqua/>
- NASA (2018b) Republic of Vanuatu Chlorophyll-a concentration. <https://oceancolor.gsfc.nasa.gov/data/aqua/>
- Naviti W (2005) Vanuatu tuna fisheries report.
- Naviti W, Aston J (2000) Status of coral reef and reef fish resources of Vanuatu. In: Johannes, B., Green, A. and Adams, T. Coral reefs in the Pacific: Status and monitoring, resources and management. Conference: International Coral Reef Initiative Pacific Islands Regional Symposium on Coral Reefs in the Pacific, Noumea, New Caledonia,
- Neef G, McCulloch MT (2001) Pliocene-Quaternary history of Futuna Island, south Vanuatu, southwest Pacific. *Aust J Earth Sci* 48:805–814
- Nimoho G, Seko A, Iinima M, Nishiyama K, Wakisaka T (2013) A baseline survey of coastal villages in Vanuatu. *SPC Tradit Mar Resour Manag Inf Bull* 32:2–84
- NOAA (2016) National Ocean Service <http://oceanservice.noaa.gov/facts/vents.html> Accessed 10/01/17.
- Norlund LM, Koch EW, Barbier EB, Creed JC (2016) Seagrass ecosystem services and their variability across genera and geographical regions. *PLoS ONE* 11:e0163091. doi:10.1371/journal.pone.0163091
- Ocean Blue Fishing (2018) Sport fishing in Vanuatu – Having a go! <https://www.oceanbluefishing.com/sport-fishing-vanuatu-having-a-go/>
- O’Hara TD, Rowden AA, Bax NJ (2011) A southern hemisphere bathyal fauna is distributed in latitudinal bands. *Curr Biol* 21:226–230
- Olds AD, Albert S, Maxwell PS, Pitt KA, Connolly RM (2013) Mangrove-reef connectivity promotes the effectiveness of marine reserves across the western Pacific. *Glob Ecol Biogeogr* 22:1040–1049
- Olds AD, Connolly RM, Pitt KA, Pittman SJ, Maxwell PS, Huijbers CM, Moore BR, Albert S, Rissik D, Babcock RC, Schlacher TA (2016) Quantifying the conservation value of seascape connectivity: a global synthesis. *Glob Ecol Biogeogr* 25:3–15
- Oregon State University (2017) Republic of Vanuatu. Oregon State Ocean Productivity Project. <https://www.science.oregonstate.edu/ocean.productivity/>
- Pakoa K, Friedman K, Tardy E, Lasi F (2009) Epi Island trochus and sea cucumber resource status and recommendations for management.
- Pakoa K, Raubani J, Siaoisi F, Amos G, Ham J (2013) The status of sea cucumber fisheries and resources in Vanuatu.
- Pante E, France SC, Gey D, Cruaud C, Samadi S (2015) An inter-ocean comparison of coral endemism on seamounts: the case of Chrysogorgia. *J Biogeogr* 42:1907–1918
- Passfield K, Gilman E (2010) Effects of Pelagic Longline Fishing on Seamount Ecosystems Based on Interviews with Pacific Island Fishers.
- Pauly D, Christensen V, Dalsgaard J, Froese R, Torres FJ (1998) Fishing down marine food webs. *Science* 279:860–863
- Payri CE (2011) Algal and seagrass communities from Santo Island in relation to habitat diversity. In: Bouchet, P., Le Guyader, H. and Pascal, O. (eds) The natural history of Santo. IRD, Paris,
- Petro G, Hickey FR, MacKay KT (2007) Leatherback turtles in Vanuatu. *Chelonian Conserv Biol* 6:135–137
- Phillips B (2016) Climate & sea level change, vulnerability & adaptation assessment of the Torres, Shepherds & Tafea groups.
- Phillips BT, Dunbabin M, Henning B, Howell C, DeCiccio A, Flinders A, Kelley KA, Scott JJ, Albert S, Carey S, Tsadok R, Grinham A (2016) Exploring the “Sharkcano”: Biogeochemical observations of the Kavachi submarine volcano (Solomon Islands). *Oceanography* 29:160–169
- Planetary Coral Reef Foundation (2004) Health of Maskelyne Reefs. <http://www.pcrf.org/science/Maskelyne/reefreport.html>
- Plaziat J-C, Lozouet P (2011) Mangroves environments of south east Santo. In: Bouchet, P., Le Guyader, H. and Pascal, O. (eds) The natural history of Santo. IRD, Paris,
- ter Poorten JJ (2015) *Fragum vanuatuense* spec. nov., a small new *Fragum* from the Central Indo-West Pacific (Bivalvia, Cardiidae). *Basteria* 79:114–120
- Price RC, Maillet P, Johnson DP (1993) Interpretation of GLORIA side-scan sonar imagery for the Coriolis Troughs of the New Hebrides backarc. *Geo-Mar Lett* 13:71–81
- Raubani J (2009) The status of coral reefs in Vanuatu 2007, in South West Pacific Status of Coral Reefs Report 2007, C. Whippy-Morris, (ed). CRISP, Secretariat of the Pacific Regional Environment Programme, Noumea, New Caledonia, pp 167–208
- Read TC, FitzSimmons NN, Wantiez L, Jensen MP, Keller F, Chateau O, Farman R, Werry J, MacKay KT, Petro G, Limpus CJ (2015) Mixed stock analysis of a resident green turtle, *Chelonia mydas*, population in New Caledonia links rookeries in the South Pacific. *Wildl Res* 42:488–499
- Reuter M, Piller WE (2011) Volcaniclastic events in coral reef and seagrass environments: evidence for disturbance and recovery (Middle Miocene, Styrian Basin, Austria). *Coral Reefs* 30:889–899
- Richer de Forges B, Koslow JA, Poore GCB (2000) Diversity and endemism of the benthic seamount fauna in the southwest Pacific. *Nature* 405:944–947
- Rogers AD (2004) The biology, ecology and vulnerability of seamount communities.
- Russell MW, Sadovy de Mitcheson Y, Erisman BE, Hamilton RJ, Luckhurst BE, Nemeth RS (2014) Status Report – world’s fish aggregations 2014.

- Samadi S, Botta L, Macpherson E, Richer de Forges B, Boisselier M-C (2006) Seamount endemism questioned by the geographic distribution and population genetic structure of marine invertebrates. *Mar Biol* 149:1463–1475
- Sandin SA, Smith JE, DeMartini EE, Dinsdale EA, Donner SD, Friedlander AM, Konotchick T, Malay M, Maragos JE, Obura D, Pantos O, Paulay G, Richie M, Rohwer F, Schroeder RE, Walsh S, Jackson JBC, Knowlton N, Sala E (2008) Baselines and degradation of coral reefs in the northern Line Islands. *PLoS ONE* 3:doi:10.1371/journal.pone.0001548
- Santana-Casiano JM, González-Dávila M, Fraile-Nuez E, De Armas D, González AG, Domínguez-Yanes JF, Escánez J (2013) The natural ocean acidification and fertilization event caused by the submarine eruption of El Hierro. *Sci Rep* 3:1140
- Schabetsberger R, Økland F, Aarestrup K, Kalfatak D, Sichrowsky U, Tambets M, Dall'Olmo G, Kaiser R, Miller PI (2013) Oceanic migration behaviour of tropical Pacific eels from Vanuatu. *Mar Ecol Prog Ser* 475:177–190
- Schmidt K, Garbe-Schönberg D, Hannington MD, Anderson MO, Bühring B, Haase K, Haruel C, Lupton J, Koschinsky A (2017) Boiling vapour-type fluids from the Nifonea vent field (New Hebrides Back-Arc, Vanuatu, SW Pacific): Geochemistry of an early-stage, post-eruptive hydrothermal system. *Geochim Cosmochim Acta* 207:185–209
- Sea Around Us Project (2009) Tuna catch within the Republic of Vanuatu's EEZ [2001–2010]. <http://www.seaaroundus.org/>
- Sea Around Us Project (2016a) Sea Around Us Project – Fisheries, ecosystems, biodiversity. <http://www.seaaroundus.org/data/#/spatial-catch?commgroups=4>
- Sea Around Us Project (2016b) Deep water fisheries catch within the Republic of Vanuatu's EEZ [2001–2010]. <http://www.seaaroundus.org/>
- Secretariat of the Convention on Biological Diversity (2014) Ecologically or Biologically Significant Marine Areas (EBSAs). Special places in the world's oceans. Volume 1: Western South Pacific Region.
- Sigurdsson IA, Kamenetsky VS, Crawford AJ, Eggins SM, Zlobin SK (1993) Primitive Island Arc and Oceanic Lavas from the Hunter Ridge-Hunter Fracture Zone. Evidence from Glass, Olivine and Spinel Compositions. *Mineral Petrol* 47:149–169
- Sih TL, Cappo M, Kingsford M (2017) Deep-reef fish assemblages of the Great Barrier Reef shelf-break (Australia). *Sci Rep* 7:10886 | DOI:10.1038/s41598-017-11452-1
- Siota C (2010) Vanuatu TREDIS report for 2010.
- Siota C (2012) Vanuatu TREDIS report for 2011–2012.
- Siota C (2014) Vanuatu TREDIS report for 2013–2014.
- Siota C (2015) Vanuatu TREDIS report for 2015.
- Smith R (1991) Bathymetry and seabed morphology, Port Havannah, Vanuatu.
- SOPAC (1985) CCOP (SOPAC)-IOCIFREMER=ORSTOM Workshop on the Uses of Submersibles and Remotely Operated Vehicles in the South Pacific.
- SOPAC (2014) Deep sea minerals policy consultations.
- SPC (2016) Guide to teachers' resource sheets on fisheries for Vanuatu.
- Stevens JD, Bonfil R, Dulvy NK, Walker PA (2000) The effects of fishing on sharks, rays, and chimaeras (chondrichthyans), and the implications for marine ecosystems. *ICES J Mar Sci* 57:476–494
- Stone GS, Madin LP, Stocks K, Hovermale G, Hoagland P, Scumacher M, Etnoyer P, Sotka C, Tausig H (2004) Chapter 2. Seamount biodiversity, exploitation and conservation. *Defy Ocean's End*. Island Press, Washington D.C.,
- SV Bravo (2017) Vanuatu wrap-up – Maewo and Pentecost Islands. <http://svbravo.blogspot.com.au/2017/12/vanuatu-wrap-up-maewo-and-pentecost.html>
- SV Fluenta (2017) Maewo and Honey – in pictures. <http://sv-fluenta.blogspot.com.au/2017/07/maewo-and-honey-in-pictures.html>
- SV Helios (2016a) Moon cave. <http://www.svhelios.com/blog/2016/11/5/moon-cave-2>
- SV Helios (2016b) Lolong Bay. <http://www.svhelios.com/blog/c5b705b9-9ea9-4340-887d-15ed3e0f214a>
- Tanaka H, Yasuhara M (2016) A new deep-sea hydrothermal vent species of Ostracoda (Crustacea) from the western Pacific: Implications for adaptation, endemism, and dispersal of ostracodes in chemosynthetic systems. *Zoolog Sci* 33:555–565
- Tarburton MK (2012) Laika Island bird checklist. <http://birdsofmelanesia.net/vanuatu8html/laika.pdf>
- Terashima H, Ham J, Kaku R, William A, Malisa M, Gereva SR, Kakuma S (2018) A field survey of the green snail (*Turbo marmoratus*) in Vanuatu: Density, effects of transplantation, and villagers' motives for participation in transplantation and conservation activities. *SPC Tradit Mar Resour Manag Knowl Inf Bull* 39:15–40
- Thaxter CB, Lascelles B, Sugar K, Cook ASCP, Roos S, Bolton M, Langston RHW, Burton NHK (2012) Seabird foraging ranges as a preliminary tool for identifying candidate Marine Protected Areas. *Biol Conserv* 156:53–61
- Thiel H, Schriever G, Ahnert A, Bluhm H, Borowski C, Vopel K (2001) The large-scale environmental impact experiment DISCOL— reflection and foresight. *Deep Sea Res Part II Top Stud Oceanogr* 48:3869–3882
- Tol SJ, Jarvis JC, York PH, Grech AM, Congdon BC, Coles RG (2017) Long distance biotic dispersal of tropical seagrass seeds by marine mega-herbivores. *Sci Rep* 4:4458 | DOI:10.1038/s41598-017-04421-1
- Tourism Department (2010) Penama Province tourism plan.
- Tranquillity Island Resort (2018) Tranquillity Island Resort turtle sanctuary. <https://tranquillitydive.com/turtle-sanctuary/>
- Turner JA, Babcock RC, Hovey R, Kendrick GA (2017) Deep thinking: a systematic review of mesophotic coral ecosystems. *ICES J Mar Sci* 74:2309–2320
- UniQuest Pty Ltd (2010) Strengthening coastal and marine resources management in the Coral Triangle of the Pacific (Phase 1).
- USP (2012) Ecosystem profile – East Melanesian Islands biodiversity hotspot.
- Van Dover CL, Smith CR, Ardron J, Dunn D, Gjerde K, Levin L, Smith S, The Dinard Workshop Contributors (2012) Designating networks of chemosynthetic ecosystem reserves in the deep sea. *Mar Policy* 36:378–381

- Vanuatu Cruising (2014a) Asanvari. <http://www.vanuatucruising.info/snorkelling--scuba-diving-at-asanvari>
- Vanuatu Cruising (2014b) Londot snorkelling. <http://www.vanuatucruising.info/londot-snorkelling>
- Vanuatu Cruising (2014c) Lutes clam sanctuary. <http://www.vanuatucruising.info/ringi-te-suh-clam-sanctuary>
- Vanuatu Cultural Centre (2007) Chief Roi Mata's Domain – Nomination by the Republic of Vanuatu for Inscription on the World Heritage List.
- Vanuatu Fisheries Department (2013a) Vanuatu national cocount crab fishery management plan.
- Vanuatu Fisheries Department (2013b) Sea cucumber stock assessment report Santo 2012.
- Vanuatu Fisheries Department (2016) Vanuatu national deep-bottom fish fishery management plan.
- Vanuatu Reef Times (2005) Niusletta blong Vanuatu Coral Reef Monitoring Network.
- Veron JEN (1990) Checklist of the hermatypic corals of Vanuatu. *Pac Sci* 44:51–70
- VESS (2017) Dugong hotspots and prioritization.
- Vetter EW, Dayton PK (1999) Organic enrichment by macrophyte detritus, and abundance patterns of megafaunal populations in submarine canyons. *Mar Ecol Prog Ser* 186:137–148
- Vetter EW, Smith CR, De Leo FC (2010) Hawaiian hotspots: enhanced megafaunal abundance and diversity in submarine canyons on the oceanic islands of Hawaii. *Mar Ecol* 31:183–199
- Vierros M, Tawake A, Hickey FR, Tiraa A, Noa R (2010) Traditional Marine Management Areas of the Pacific in the context of national and international law and policy.
- Villanueva RD, Baria MVB, de la Cruz DW (2013) Effects of grazing by herbivorous gastropod (*Trochus niloticus*) on the survivorship of cultured coral spat. *Zool Stud* 52:44
- VLIZ (2014) Republic of Vanuatu dissolved oxygen concentration. <http://aquamaps.org/>
- Vrijenhoek RC (1997) Gene flow and genetic diversity in naturally fragmented metapopulations of deep-sea hydrothermal vent animals. *J Hered* 88:85–293
- Vroom PS, Zgliczynski BJ (2011) Effects of volcanic ash deposits on four functional groups of a coral reef. *Coral Reefs* 30:1025–1032
- Wan Smolbag Theatre (2010) Wan Smolbag Theatre biannual report January–June 2010.
- WannaDive (2018) Cathedral, Vanuatu, Efate Island. https://www.wannadive.net/spot/Australia_Pacific/Vanuatu/Efate_island/Cathedral/
- Wantok Environment Centre (2007) VanBirds. <https://web.archive.org/web/20071021070131/http://www.positiveearth.org/vanbirds/index.htm>
- Wantok Environment Centre (2009a) Reef Islands, uninhabited paradise of the Banks. <http://www.positiveearth.org/bungalows/TORBA/reefislands.htm>
- Wantok Environment Centre (2009b) Nikaura Marine Protected Area, Epi Island. http://www.positiveearth.org/bungalows/shefa/nikaura_mpa.htm
- Webb GJW, Manolis SC, Brien ML (2010) Saltwater Crocodile *Crocodylus porosus*. In: Manolis, S. C. and Stevenson, C. (eds) *Crocodyles. Status Survey and Conservation Action Plan*. Crocodile Specialist Group, Darwin, pp 99–113
- Wei C-L, Rowe GT, Escobar-Briones E, Nunnally C, Soliman Y, Ellis N (2012) Standing stocks and body size of deep-sea Macrofauna: predicting the baseline of 2010 deepwater Horizon Oil Spill in the Northern Gulf of Mexico. *Deep Sea Res Part Oceanogr Res Pap* 69:82–99
- Welch D (2016) Broad-scale assessment of the status of coastal finfish in North Efate, Vanuatu.
- White Grass Ocean Resort (2017) Volcano Island divers. <http://whitegrasstanna.com/diving/>
- Wilkinson C (2008) Status of Coral Reefs of the World: 2008. 298
- Wilson EG, Miller KL, Allison D, Magliocca M (2006) Why healthy oceans need sea turtles.
- Wishner KF, Graff JR, Martin JW, Carey S, Sigurdsson H, Seibel BA (2005) Are midwater shrimp trapped in the craters of submarine volcanoes by hydrothermal venting? *Deep Sea Res Part Oceanogr Res Pap* 52:1528–1535
- Xu G, Lavelle JW (2017) Circulation, hydrography, and transport over the summit of Axial Seamount, a deep volcano in the Northeast Pacific. *J Biophys Res Oceans* 122:5404–5422
- Yachts in Transit (2014) Tongoa Wall, Tongoa Island, Vanuatu. <https://www.yit.nz/diving/gypseaheart/2014/tongoa-wall-tongoa-island-vanuatu>
- Yesson C, Taylor ML, Tittensor DP, Davies AJ, Guinotte J, Baco AR, Black J, Hall-Spencer JM, Rogers AD (2012) Global habitat suitability of cold-water Octocorals. *J Biogeogr* 39:1278–1292
- Zintzen V, Roberts CD, Clark MR, Williams A, Althaus F, Last PR (2011) Composition, distribution and regional affinities of the deepwater ichthyofauna of the Lord Howe Rise and Norfolk Ridge, south-west Pacific Ocean. *Deep Sea Res Part II Top Stud Oceanogr* 58:933–947

6. APPENDICES

APPENDIX 1

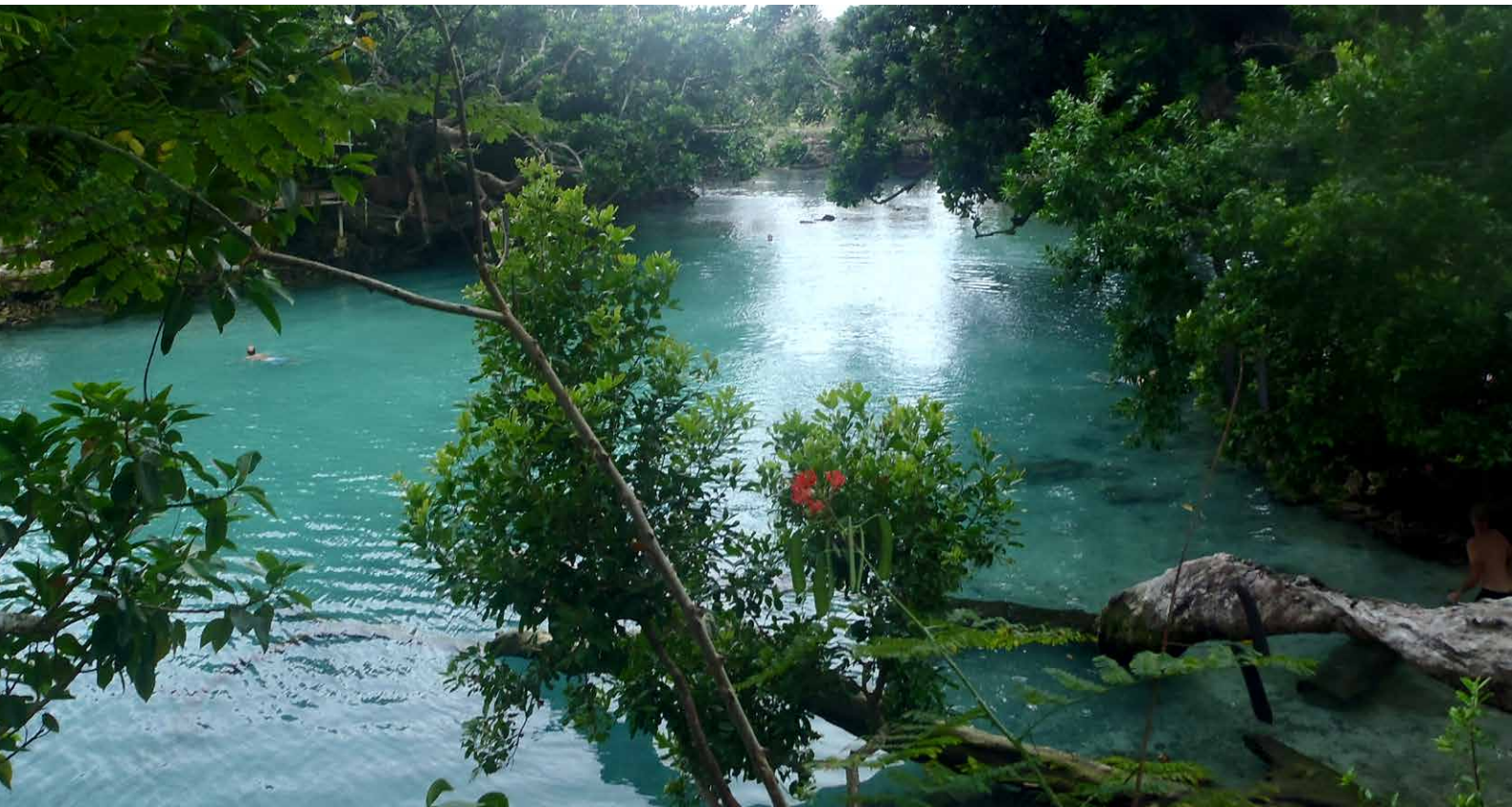
BIOPHYSICAL DATA AVAILABLE DURING THE WORKSHOP

1. LIST OF BIODIVERSITY MAPS AVAILABLE IN HARDCOPY

- VUT Overview Map of Vanuatu (including islands and provinces)
- VUT Bathymetry EEZ (including coastlines)
- VUT Geomorphology EEZ
- VUT Seamounts EEZ
- VUT Seamounts Classification EEZ
- VUT Hydrothermal Vents EEZ
- VUT Mangroves, Seagrasses and Reefs
- VUT Sea Surface Temperatures (SST) EEZ
- VUT Chlorophyll-A concentration EEZ
- VUT Ocean Productivity EEZ
- VUT Upwelling EEZ
- VUT Downwelling EEZ
- VUT Particulate Organic Carbon flux EEZ
- VUT Ocean Surface Currents EEZ
- VUT Coral Species Richness EEZ
- VUT Turtle Research and Monitoring Database System (TREDS) EEZ
- VUT Marine Species Richness (Aquamaps) EEZ
- VUT Benthic Marine Species Richness (Aquamaps) EEZ
- VUT Pelagic Marine Species Richness (Aquamaps) EEZ
- VUT Coldwater Coral Habitat Suitability EEZ
- VUT Ecologically and Biologically significant Areas (EBSAs)
- VUT Key Biodiversity Areas (KBAs) and Islandscapes EEZ
- VUT Important Bird and Biodiversity Areas (IBAs)
- VUT Marine Managed Areas

2. LIST OF BIODIVERSITY MAPS AVAILABLE ELECTRONICALLY

- All of the above
- VUT Mixed Layer Depth EEZ
- VUT Photosynthetically Available Radiation EEZ
- VUT Dissolved Oxygen Concentration EEZ
- VUT Particulate Inorganic Carbon Flux EEZ
- VUT Phosphate EEZ
- VUT pH EEZ
- VUT silicate EEZ
- VUT Earthquakes EEZ
- VUT Front Count EEZ
- VUT Frontal Index EEZ
- VUT Marine Pollution Incidents EEZ
- VUT Nitrate EEZ
- VUT Reefs At Risk EEZ
- VUT Historic Tsunamis Location EEZ
- VUT Historic Earthquakes Location EEZ
- VUT Mean Annual Phytoplankton Concentration EEZ
- VUT Diffuse Attenuation Coefficient (per meter of depth) EEZ



APPENDIX 2

LIST OF WORKSHOP PARTICIPANTS AND GROUP LISTINGS

OFFSHORE SUMA

GROUP	NAMES	ORGANISATION
Central Offshore (Red)	Elena Silas	VCAP fisheries officer
	Douglas Koran	Vanuatu Environmental Science Society (VESS)
	Rocky Kaku	Vanuatu Fisheries Department
	Sharon Boe	Lands Dept
	Camillia Garae	Geology & Mines
	John Lagette A	Community authorised fisheries officer Maskylene Islands
	Malcolm Linewak	PENAMA provincial fisheries officer
	Sano George	Emau Fishermans association
	Vari Fred	Makira Fishermans association
	John Ronneth	Island Reach
	Christina Shaw	Vanuatu Environmental Science Society (VESS)
	George Amos	Vanuatu Fisheries Department
	Alick Onesmas	Meresauwia Nguna Area Secretary
	Emil Samuel	RESSCUE Project/ Live & Learn
Southern Offshore (Blue)	Lennon Nauka	Aniwa area council secretary
	Remy Nambil	N/Erromango Area Council
	Roel Tari	Foreign Affairs
Northern Offshore (Green)	Jimmy Willy	TORBA provincial Fisheries officer
	Clay Sara	SANMA provincial Fisheries
Roaming	Sam Sundermann	Island Reach
	Dave Loubser	SPREP
	Vivian Fischer	Environment consultant
	Ionie Bolenga	Foreign Affairs
	Kate Davey	MACBIO/IUCN
	Toney Tevi	Foreign Affairs
	Hans Wendt	GIS Support (MACBIO/IUCN)
	Vatu Molisa	MACBIO/IUCN
	John Kaitu'u	GIS Support and MACBIO/GIZ

INSHORE SUMA

GROUP	NAME	ORGANISATION
Malampa and Penama Province (Brown)	Elena Silas	VCAP fisheries officer
	Douglas Koran	Vanuatu Environmental Science Society (VESS)
	Sharon Boe	Lands Dept & GIS Support
	Camillia Garae	Geology & Mines
	John Lagette A	Community authorised fisheries officer Maskylene Islands
	Malcolm Linewak	PENAMA provincial fisheries officer
	Sano George	Emau Fishermans association
Shefa Province (Red)	Vari Fred	Makira Fishermans association
	John Ronneth	Island Reach
	Christina Shaw	Vanuatu Environmental Science Society (VESS)
	George Amos	Vanuatu Fisheries Department
	Alick Onesmas	Meresauwia Nguna Area Secretary
	Emil Samuel	RESSCUE Project/ Live & Learn
	Rocky Kaku	Vanuatu Fisheries Department & GIS Support
	Lennon Nauka	Aniwa area council secretary
Tafea Province (Black)	Remy Nambil	N/Erromango Area Council
	Roel Tari	Foreign Affairs
	Hans Wendt	GIS Support (MACBIO/IUCN)
	Tom Kiri	Tafea provincial fisheries officer
	Jimmy Willy	TORBA provincial Fisheries officer
Sanma and Torba Province (Green)	Clay Sara	SANMA provincial Fisheries
	John Kaitu'u	GIS Support and MACBIO/GIZ
	Francis Hickey	Cultural Centre
	Josephine Rambay	Environment Department, NBSAP Coord.
	Sam Sundermann	Island Reach
Roaming	Dave Loubser	SPREP
	Vivian Fischer	Environment consultant
	Ionie Bolenga	Foreign Affairs
	Kate Davey	MACBIO/IUCN
	Toney Tevi	Foreign Affairs

APPENDIX 3

WORKSHOP AGENDA

VENUE: WORKSHOP OBJECTIVE: GRAND CASINO, PORT VILLA, VANUATU

DATE: WEDNESDAY 25 OCTOBER 2017

WORKSHOP OBJECTIVE(S)

Identify, for Vanuatu, both inshore and offshore, biophysically special, unique marine areas

TIME	ACTIVITIES	PRESENTERS
8.00AM	Registration	
8:30AM	Welcome Remarks and Opening Prayer	Mr Charles Lini; 1st Political Adviser for the Minister of Foreign Affairs ¹
8:45AM	Meeting context and background on Oceans Policy and MSP in Vanuatu and how this workshop outputs will contribute to both	Director, Ocean and Maritime Affairs, Ministry of Foreign Affairs, International Cooperation and External Trade Mr Toney Tevi
9: 15AM	Understanding the Agenda and the task ahead; Introductions and Expectations	Mr Vatu Molisa
10: 00	MORNING TEA & GROUP PHOTO	ALL
10.30AM	Presentation on existing data (coral reefs, mangroves, bathymetry, geomorphology, EBSA, species richness, productivity, important bird areas, MPAs, LMMAs etc) (30 min)	Mr Hans Wendt (MACBIO Project)
11:00AM	Definition of criteria for the selection of biophysically special, unique marine areas Amount, detail and nature of justification Geographic explicitness Source types and number National/international obligations	Ms Kate Davey (MACBIO Project)
11:15	Workshop process for identification of biophysically special, unique marine areas	Mr Vatu Molisa
11:30AM	Assessment of biophysically special, unique marine areas INSHORE: Torba and Sanma Provinces Penama and Malampa Provinces Shefa Tafea Provinces	All – in breakout groups Each group to have: Facilitator Rapporteur GIS support person
1 PM	LUNCH	
2PM	Feedback from groups (~10m min each)	Group presenters
3PM	Assessment of biophysically special, unique marine areas OFFSHORE: Northern offshore part of Vanuatu Central offshore part of Vanuatu Southern offshore part of Vanuatu	All – in breakout groups Each group to have: Facilitator Rapporteur GIS support person
4PM	Feedback from groups (~10 minutes each)	Group presenters
4.30PM	Reflections upon meeting expectations	Mr Toney Tevi
4.45PM	Next steps and closing	Mr Tony Tevi/ Mr Vatu Molisa

APPENDIX 4

WORKSHOP SITE RESPONSE SHEET AND LIST OF MAPS PROVIDED FOR PARTICIPANTS TO DRAW SITES UPON

Vanuatu Biophysically Special, Unique Marine Areas Workshop - Worksheet

25 OCTOBER 2017

Group:

Site number:

Site name:

Location/ geographic description:

Justification:

Sources:

Any legal obligations:

Follow-ups:

LIST OF MAPS FOR PARTICIPANTS TO DRAW UPON

REGIONAL MAPS

- Republic of Vanuatu – EEZ wide Map
- Republic of Vanuatu – Northern Section Map
- Republic of Vanuatu – Central Section Map
- Republic of Vanuatu – Southern Section Map
- Sanma Province Map
- Malampa Province Map
- Penama Province Map
- Shefa Province Map
- Torba Province Map

ZOOMED IN MAPS

- Ambae island
- Ambrym Island
- Aneityum Island
- Aniwa Is
- Efate
- Emae and Makira islands
- Epi island
- Erromango Island
- Espiritu Santo and nearby islands
- Futuna Island
- Gaua (Santa Maria) island
- Maewo and nearby islands
- Malekula and nearby islands
- Mataso and Etarik island
- Mere Lava Island
- Merig island
- Mota island
- Paama and Lopevi Islands
- Pentecost
- Peten, Ro, Wosu, Enwut, Lomeur and Watansa islands
- Tanna Island
- Tongoa and nearby islands
- Torres Group
- Ureparapara island
- Vanua Lava and nearby islands
- Vot Tande islands

APPENDIX 5

LIST OF SPECIES KNOWN TO OCCUR IN VANUATU WITH INTERNATIONAL AND NATIONAL OBLIGATIONS

The species list was generated through a country- and region-specific search of Species + (www.speciesplus.net) and the IUCN Red List (www.iucnredlist.org). This table was used to verify the obligations for each site, where particular species were known to occur at the site. CITES: The Convention on International Trade in Endangered Species of Wild Fauna and Flora; CMS: Convention on Migratory Species; IUCN: International Union for the Conservation of Nature; DD: Data Deficient; LC: Least Concern; NT: Near Threatened; VU: Vulnerable; EN: Endangered.

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Aholeholes	<i>Kuhlia marginata</i>	Dark-margined flagtail			LC	Indo-Pacific	no
Aholeholes	<i>Kuhlia mugil</i>	Barred flagtail			LC	Indo-Pacific	yes
Aholeholes	<i>Kuhlia munda</i>	Silver flagtail			DD	restricted	yes
Aholeholes	<i>Kuhlia rupestris</i>	Jungle perch			LC	Indo-Pacific	yes
Alfonsino	<i>Beryx splendens</i>	Alfonsino			LC	circumglobal	no
Anchovy	<i>Thryssa setirostris</i>	Longjaw Thryssa			LC	Indo-Pacific	unknown
Angelfish	<i>Apolemichthys trimaculatus</i>	Three-spot angelfish			LC	Indian Ocean, western Pacific	no
Angelfish	<i>Centropyge bicolor</i>	Bicolor angelfish			LC	Indo-west Pacific	no
Angelfish	<i>Centropyge bispinosus</i>	Two-spined angelfish			LC	Indo-Pacific	no
Angelfish	<i>Centropyge fisheri</i>	Fisher's angelfish			LC	Indo-west Pacific, Pacific	no
Angelfish	<i>Centropyge flavissima</i>	Lemonpeel angelfish			LC	Central Pacific	no
Angelfish	<i>Centropyge heraldi</i>	Herald's angelfish			LC	Indo-west Pacific, Pacific	no
Angelfish	<i>Centropyge loricula</i>	Flame angelfish			LC	Indo-west Pacific, Pacific	no
Angelfish	<i>Centropyge tibicen</i>	Keyhole angelfish			LC	Indo-Pacific	no
Angelfish	<i>Centropyge vrolikii</i>	Pearl-scaled angelfish			LC	Indo-west Pacific, Pacific	no
Angelfish	<i>Centropyge aurantia</i>	Golden angelfish			LC	western Pacific	no
Angelfish	<i>Centropyge colini</i>	Cocos-Keeling angelfish			LC	Indo-Pacific	no
Angelfish	<i>Centropyge multicolor</i>	Multicolor angelfish			LC	western and central Pacific	no
Angelfish	<i>Centropyge nox</i>	Midnight angelfish			LC	western Pacific	no
Angelfish	<i>Genicanthus bellus</i>	Ornate angelfish			LC	western Pacific	no
Angelfish	<i>Genicanthus lamarck</i>	Blackstriped angelfish			LC	western Pacific	no
Angelfish	<i>Genicanthus melanospilos</i>	Spotbreast angelfish			LC	western Pacific	no
Angelfish	<i>Genicanthus watanabei</i>	Blackedged angelfish			LC	western and central Pacific	no
Angelfish	<i>Paracentropyge multifasciata</i>	Barred angelfish			LC	Indo-Pacific	no
Angelfish	<i>Pomacanthus imperator</i>	Emperor angelfish			LC	Indian Ocean, Indo-Pacific	no
Angelfish	<i>Pomacanthus semicirculatus</i>	Semicircle angelfish			LC	Indian Ocean, Indo-Pacific	no
Angelfish	<i>Pomacanthus sexstriatus</i>	Sixbar angelfish			LC	Indo-west Pacific	no
Angelfish	<i>Pomacanthus xanthurus</i>	Yellowface angelfish			LC	Indo-Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Angelfish	<i>Pygoplites diacanthus</i>	Bluebanded angelfish			LC	Indo-west Pacific	no
Anglerfish	<i>Ceratias holboelli</i>	Deepsea angler			LC	circumglobal, deep	no
Anglerfish	<i>Chaenophryne draco</i>	Anglerfish			LC	circumglobal, deep	no
Anglerfish	<i>Chaenophryne ramifera</i>	Anglerfish			LC	widespread, deep	no
Anglerfish	<i>Cryptopsaras couesii</i>	Warty seadevil			LC	circumglobal, deep	no
Anglerfish	<i>Histrio histrio</i>	Sargassum anglerfish			LC	circumtropical	no
Anglerfish	<i>Microlophichthys microlophus</i>	Anglerfish			LC	widespread, deep	no
Anglerfish	<i>Oneirodes eschrichtii</i>	Bulbous dreamer			LC	circumglobal, deep	no
Anthias	<i>Liopropoma mitratum</i>	Pinstriped basslet			LC	Indo-Pacific	no
Anthias	<i>Liopropoma multilineatum</i>	Manyline perch			LC	western Pacific	no
Anthias	<i>Liopropoma swalesi</i>	Swales' basslet			LC	western Pacific	no
Anthias	<i>Liopropoma tonstrinum</i>	Redstriped basslet			LC	Indo-Pacific	no
Anthias	<i>Luzonichthys waitei</i>	Slender anthias			LC	Indo-Pacific	no
Anthias	<i>Luzonichthys whitleyi</i>	Whitley's splitfin			LC	Indo-Pacific	no
Anthias	<i>Plectranthias nanus</i>	Pygmy basslet			LC	Indian Ocean, Indo-Pacific	no
Anthias	<i>Plectranthias winniensis</i>	Redblotch basslet			LC	Indo-west Pacific	no
Anthias	<i>Plectranthias longimanus</i>	Longfin perchlet			LC	Indo-Pacific	no
Anthias	<i>Pseudanthias cooperi</i>	Redbar anthias			LC	Indian Ocean, Indo-Pacific	no
Anthias	<i>Pseudanthias gibbosus</i>	Anthias			LC	Indo-Pacific	no
Anthias	<i>Pseudanthias hypselosoma</i>	Stocky anthias			LC	Indo-Pacific	no
Anthias	<i>Pseudanthias squamipinnis</i>	Lyretail anthias			LC	Indo-west Pacific	no
Anthias	<i>Pseudanthias bicolor</i>	Bicolour anthias			LC	Indo-Pacific	no
Anthias	<i>Pseudanthias dispar</i>	Peach fairy basslet			LC	Indo-Pacific	no
Anthias	<i>Pseudanthias engelhardi</i>	Orangebar anthias			LC	western Pacific	no
Anthias	<i>Pseudanthias flavicauda</i>	Anthias			LC	western Pacific	no
Anthias	<i>Pseudanthias huchtii</i>	Red-cheeked fairy basslet			LC	central Indo-Pacific	no
Anthias	<i>Pseudanthias lori</i>	Lori's anthias			LC	Indo-Pacific	no
Anthias	<i>Pseudanthias luzonensis</i>	Yellowlined anthias			LC	western Pacific	no
Anthias	<i>Pseudanthias pascalus</i>	Amethyst anthias			LC	western Pacific	no
Anthias	<i>Pseudanthias privitera</i>	Anthias			LC	central Pacific, Vanuatu	no
Anthias	<i>Pseudanthias smithvanizi</i>	Princess anthias			LC	Indo-Pacific	no
Anthias	<i>Pseudanthias tuka</i>	Purple anthias			LC	Indo-Pacific	no
Anthias	<i>Serranocirrhites latus</i>	Hawkfin anthias			LC	western Pacific	no
Archerfish	<i>Toxotes jaculatrix</i>	Banded archerfish			LC	Indo-Pacific	no
Barbeled dragonfish	<i>Photostomias atrox</i>	Barbeled dragonfish			LC	widespread, deep	no
Barbeled dragonfish	<i>Photostomias guernei</i>	Loosejaw			LC	widespread, deep	no
Barracuda	<i>Sphyaena barracuda</i>	Great barracuda			LC	circumtropical	no
Barracudina	<i>Arctozenus risso</i>	Spotted barracudina			LC	widespread, deep	no
Barracudina	<i>Lestidium atlanticum</i>	Atlantic barracudina			LC	circumglobal, deep	no
Barracudina	<i>Lestrolepis intermedia</i>	Barracudina			LC	circumglobal, deep	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Barracudina	<i>Magnisudis atlantica</i>	Duckbill barracudina			LC	circumglobal, deep	no
Barracudina	<i>Paralepis elongata</i>	Barracudina			LC	widespread, deep	no
Barracudina	<i>Sudis atrox</i>	Hideous barracudina			LC	circumglobal, deep	no
Barreleye	<i>Winteria telescopa</i>	Barreleye			LC	circumtropical, deep	no
Bigeye	<i>Cookeolus japonicus</i>	Deepwater bigeye			LC	circumglobal, deep	no
Bigeye	<i>Heteropriacanthus cruentatus</i>	Glasseye snapper			LC	circumglobal, deep	no
Bigeye	<i>Priacanthus hamrur</i>	Moontail bullseye			LC	Indo-west Pacific	no
Bigeye	<i>Priacanthus blochii</i>	Peony bulleye			LC	Indo-Pacific	no
Bigeye	<i>Pristigenys meyeri</i>	Bigeye			LC	western Pacific	no
Billfish	<i>Tetrapturus angustirostris</i>	Shortbill spearfish			DD	widespread	yes
Billfish	<i>Xiphias gladius</i>	Swordfish			LC	circumglobal	yes
Bivalve	<i>Hippopus hippopus</i>	Horse's hoof clam	II		LR/cd	Indo-west Pacific	no
Bivalve	<i>Nicaisolopha tridacnaeformis</i>	Oyster			DD	widespread	no
Bivalve	<i>Saccostrea circumsuta</i>	Oyster			DD	Indo-Pacific	no
Bivalve	<i>Saccostrea scyphophilla</i>	Oyster			LC	Indo-Pacific	no
Bivalve	<i>Tridacna crocea</i>	Boring clam	II		LR/lc	Indo-west Pacific	no
Bivalve	<i>Tridacna derasa</i>	Southern giant clam	II		VU	Extinct	no
Bivalve	<i>Tridacna gigas</i>	Giant clam	II		VU	Extinct	no
Bivalve	<i>Tridacna maxima</i>	Small giant clam	II		LR/cd	widespread	no
Bivalve	<i>Tridacna squamosa</i>	Fluted giant clam	II		LR/cd	widespread	no
Black seadevil	<i>Melanocetus murrayi</i>	Black seadevil			LC	circumglobal, deep	no
Black seadevils	<i>Melanocetus johnsonii</i>	Humpback anglerfish			LC	widespread, deep	no
Blackchin	<i>Neoscopelus macrolepidotus</i>	Largescaled lanternfish			LC	circumglobal, deep	no
Blenny	<i>Alticus sertatus</i>	Garlanded rockskipper			LC	southwest Pacific	no
Blenny	<i>Andamia amphibius</i>	Blenny			LC	Solomon Islands, Vanuatu	no
Blenny	<i>Aspidontus dussumieri</i>	Lance blenny			LC	Indo-Pacific, Pacific	no
Blenny	<i>Aspidontus taeniatus</i>	False cleaner			LC	Central and western Pacific	no
Blenny	<i>Atrosalarias holomelas</i>	Brown coral blenny			LC	Central and western Pacific	no
Blenny	<i>Blenniella caudolineata</i>	Blue-spotted blenny			LC	western Pacific	no
Blenny	<i>Blenniella chrysospilos</i>	Orange-spotted blenny			LC	Indo-Pacific	no
Blenny	<i>Cirripectes castaneus</i>	Chestnut blenny			LC	widespread	no
Blenny	<i>Cirripectes chelomatus</i>	Lady Musgrave blenny			LC	western Pacific	no
Blenny	<i>Cirripectes filamentosus</i>	Filamentous blenny			LC	Indo-Pacific	no
Blenny	<i>Cirripectes polyzona</i>	Barred blenny			LC	Indo-Pacific	no
Blenny	<i>Cirripectes quagga</i>	Squiggly blenny			LC	Indo-Pacific	no
Blenny	<i>Cirripectes stigmaticus</i>	Red-streaked blenny			LC	Indo-Pacific	no
Blenny	<i>Ecsenius bicolor</i>	Bicolor blenny			LC	Indo-Pacific	no
Blenny	<i>Ecsenius isos</i>	Blenny			LC	New Caledonia, Vanuatu	no
Blenny	<i>Ecsenius midas</i>	Midas blenny			LC	Indo-west Pacific	no
Blenny	<i>Ecsenius tessera</i>	Blenny			LC	New Caledonia, Solomon Islands, Vanuatu	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Blenny	<i>Ecsenius yaeyamaensis</i>	Pale-spotted combtooth blenny			LC	Indo-Pacific	no
Blenny	<i>Enchelyurus ater</i>	Black blenny			LC	south-west Pacific	no
Blenny	<i>Entomacrodus caudofasciatus</i>	Bartail blenny			LC	western and central Pacific	no
Blenny	<i>Entomacrodus cymatobiotus</i>	Pacific rockskipper			LC	Pacific	no
Blenny	<i>Entomacrodus decussatus</i>	Wavyline rockskipper			LC	Indo-Pacific	no
Blenny	<i>Entomacrodus niuafoouensis</i>	Tattoo-chin rockskipper			LC	Pacific	no
Blenny	<i>Entomacrodus striatus</i>	Blackspotted rockskipper			LC	Indo-Pacific, Pacific	no
Blenny	<i>Entomacrodus thalassinus</i>	Reef margin blenny			LC	Indo-Pacific	no
Blenny	<i>Exallias brevis</i>	Leopard blenny			LC	Indo-Pacific	no
Blenny	<i>Glyptoparus delicatulus</i>	Delicate blenny			LC	Indo-Pacific	no
Blenny	<i>Istiblennius bellus</i>	Dusky blenny			LC	Indo-Pacific	no
Blenny	<i>Istiblennius dussumieri</i>	Dussumier's rockskipper			LC	Indo-west Pacific	no
Blenny	<i>Istiblennius lineatus</i>	Black-lined blenny			LC	Indo-Pacific	no
Blenny	<i>Meiacanthus anema</i>	Threadless blenny			DD	Coral Triangle	yes
Blenny	<i>Meiacanthus atrodorsalis</i>	Forktail blenny			LC	western Pacific	no
Blenny	<i>Meiacanthus ditrema</i>	One-striped poison-fang blenny			LC	Coral Triangle	no
Blenny	<i>Nannosalarias nativitatis</i>	Christmas blenny			LC	Indo-Pacific	no
Blenny	<i>Omobranchus elongatus</i>	Chevroned blenny			LC	Indo-Pacific	no
Blenny	<i>Omobranchus obliquus</i>	Mangrove blenny			LC	Indo-Pacific	no
Blenny	<i>Petroscirtes mitratus</i>	Highfinned blenny			LC	Indo-west Pacific	no
Blenny	<i>Petroscirtes variabilis</i>	Variable sabretooth blenny			LC	western Pacific	no
Blenny	<i>Petroscirtes xestus</i>	Bearded sabretooth blenny			LC	Indo-Pacific	no
Blenny	<i>Plagiotremus tapeinosoma</i>	Piano fangblenny			LC	Indo-Pacific	no
Blenny	<i>Plagiotremus laudandus</i>	Bicolour fangblenny			LC	Indo-west Pacific	no
Blenny	<i>Plagiotremus rhinorhynchos</i>	Bluestriped fangblenny			LC	Indo-Pacific	no
Blenny	<i>Praealticus bilineatus</i>	Blenny			LC	central Indo-Pacific	no
Blenny	<i>Praealticus striatus</i>	Blenny			LC	central Indo-Pacific	no
Blenny	<i>Rhabdoblennius snowi</i>	Snow blenny			LC	South Pacific	no
Blenny	<i>Salarias alboguttatus</i>	Whitespotted blenny			LC	western Pacific	no
Blenny	<i>Salarias fasciatus</i>	Banded jewelled-blenny			LC	Indo-Pacific	no
Blenny	<i>Salarias guttatus</i>	Blue-spot blenny			LC	Indo-west Pacific	no
Blenny	<i>Salarias segmentatus</i>	Segmented blenny			LC	Coral Triangle	no
Blenny	<i>Stanulus seychellensis</i>	Seychelles blenny			LC	Indo-Pacific	no
Blind cusk eels	<i>Aphyonus gelatinosus</i>	Gelatinous blindfish			LC	widespread, deep	no
Boa	<i>Candoia bibroni</i>	Solomon Island tree boa	II		LC	western Pacific	no
Boarfish	<i>Antigonia capros</i>	Deep-bodied boarfish			LC	widespread, deep	no
Booby	<i>Sula leucogaster</i>	Brown booby			LC	223000000	no
Booby	<i>Sula sula</i>	Red-footed booby			LC	185000000	yes
Bream	<i>Nemipterus vitiensis</i>	Fiji threadfin bream			LC	Fiji, Vanuatu	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Bream	<i>Pentapodus aureofasciatus</i>	Yellowstripe threadfin bream			LC	western Pacific	no
Bream	<i>Pentapodus caninus</i>	Smalltoothed whiptail			LC	western Pacific	no
Bream	<i>Scolopsis bilineata</i>	Two-lined monocle bream			LC	Indian Ocean, Indo-Pacific	no
Bream	<i>Scolopsis affinis</i>	Two-lined monocle bream			LC	Indo-Pacific	no
Bream	<i>Scolopsis ciliata</i>	Saw-jawed Monocle Bream			LC	Indo-Pacific	no
Bream	<i>Scolopsis lineata</i>	Striped monocle bream			LC	western Pacific	no
Bream	<i>Scolopsis margaritifera</i>	Pearly monocle bream			LC	Indo-Pacific	no
Bream	<i>Scolopsis temporalis</i>	Bald-spot monocle bream			LC	western Pacific	no
Bream	<i>Scolopsis trilineata</i>	Three-lined Monocle Bream			LC	Indo-Pacific	no
Bristlemouth	<i>Cyclothone acclinidens</i>	Bent-tooth bristlemouth			LC	circumglobal, deep	no
Bristlemouth	<i>Cyclothone alba</i>	Pale bristlemouth			LC	circumglobal, deep	no
Bristlemouth	<i>Cyclothone braueri</i>	Brauer's bristlemouth			LC	circumglobal, deep	no
Bristlemouth	<i>Cyclothone microdon</i>	Smalltooth bristlemouth			LC	circumglobal, deep	no
Bristlemouth	<i>Cyclothone pallida</i>	Bicolored bristlemouth			LC	circumglobal, deep	no
Bristlemouth	<i>Cyclothone pseudopallida</i>	Slender bristlemouth			LC	circumglobal, deep	no
Bristlemouth	<i>Cyclothone parapallida</i>	Shadow bristlemouth			LC	circumglobal, deep	no
Bristlemouth	<i>Diplophos taenia</i>	Pacific portholefish			LC	circumglobal	no
Bristlemouth	<i>Gonostoma atlanticum</i>	Bristlemouth			LC	widespread, deep	no
Bristlemouth	<i>Gonostoma elongatum</i>	Elongated bristlemouth			LC	circumglobal, deep	no
Butterflyfish	<i>Chaetodon auriga</i>	Threadfin butterflyfish			LC	Indo-Pacific	no
Butterflyfish	<i>Chaetodon bennetti</i>	Bennett's butterflyfish			DD	widespread, uncommon	no
Butterflyfish	<i>Chaetodon citrinellus</i>	Citron butterflyfish			LC	Indo-Pacific	no
Butterflyfish	<i>Chaetodon ephippium</i>	Saddleback butterflyfish			LC	Indo-Pacific	no
Butterflyfish	<i>Chaetodon flavirostris</i>	Dusky butterflyfish			LC	widespread	no
Butterflyfish	<i>Chaetodon kleinii</i>	Whitespotted butterflyfish			LC	Indo-Pacific	no
Butterflyfish	<i>Chaetodon lineolatus</i>	Lined butterflyfish			LC	Indo-Pacific	no
Butterflyfish	<i>Chaetodon lunula</i>	Redstripe butterflyfish			LC	Indo-Pacific	no
Butterflyfish	<i>Chaetodon lunulatus</i>	Oval butterflyfish			LC	western Pacific	no
Butterflyfish	<i>Chaetodon melannotus</i>	Blackbacked butterflyfish			LC	Indo-west Pacific	no
Butterflyfish	<i>Chaetodon mertensii</i>	Orangebar butterflyfish			LC	western Pacific	no
Butterflyfish	<i>Chaetodon ornatissimus</i>	Ornate butterflyfish			LC	Indo-west Pacific	no
Butterflyfish	<i>Chaetodon pelewensis</i>	Dot and dash butterflyfish			LC	south Pacific	no
Butterflyfish	<i>Chaetodon plebius</i>	Blueblotch butterflyfish			LC	western Pacific	no
Butterflyfish	<i>Chaetodon speculum</i>	Oval-spot butterflyfish			LC	Indo-west Pacific	no
Butterflyfish	<i>Chaetodon trifascialis</i>	Triangulate butterflyfish			LC	widespread	no
Butterflyfish	<i>Chaetodon ulietensis</i>	Pacific double-saddle butterflyfish			LC	Indo-west Pacific, Pacific	no
Butterflyfish	<i>Chaetodon unimaculatus</i>	Teardrop butterflyfish			LC	Indo-Pacific	no
Butterflyfish	<i>Chaetodon vagabundus</i>	Vagabond butterflyfish			LC	widespread	no
Butterflyfish	<i>Chaetodon baronessa</i>	Eastern triangular butterflyfish			LC	Indo-Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Butterflyfish	<i>Chaetodon meyeri</i>	Scrawled butterflyfish			LC	Indo-Pacific	no
Butterflyfish	<i>Chaetodon rafflesii</i>	Latticed butterflyfish			LC	Indo-Pacific	no
Butterflyfish	<i>Chaetodon reticulatus</i>	Reticulated butterflyfish			DD	western and central Pacific	no
Butterflyfish	<i>Chaetodon semeion</i>	Dotted butterflyfish			LC	Indo-Pacific	no
Butterflyfish	<i>Forcipiger flavissimus</i>	Long-nosed butterflyfish			LC	widespread	no
Butterflyfish	<i>Forcipiger longirostris</i>	Black long-nosed butterflyfish			LC	Indo-Pacific	no
Butterflyfish	<i>Hemitaenichthys polylepis</i>	Pyramid butterflyfish			LC	Central western Pacific	no
Butterflyfish	<i>Heniochus acuminatus</i>	Bannerfish			LC	Indo-Pacific	no
Butterflyfish	<i>Heniochus chrysostomus</i>	Pennant bannerfish			LC	Indo-Pacific	no
Butterflyfish	<i>Heniochus monoceros</i>	Masked bannerfish			LC	Indo-Pacific	no
Butterflyfish	<i>Heniochus singularis</i>	Singular bannerfish			LC	Indo-Pacific, Pacific	no
Butterflyfish	<i>Heniochus varius</i>	Humpbacked coralfish			LC	western and central Pacific	no
Cardinalfish	<i>Apogon amboinensis</i>	Ambon cardinalfish			DD	Indo-west Pacific	no
Cardinalfish	<i>Apogonichthys ocellatus</i>	Ocellated cardinalfish			LC	Indo-Pacific	no
Cardinalfish	<i>Ostorhinchus compressus</i>	Ochre-striped cardinalfish			LC	Indo-Pacific	no
Cardinalfish	<i>Ostorhinchus lateralis</i>	Humpback cardinalfish			LC	Indian Ocean, Indo-Pacific	no
Chub	<i>Kyphosus cinerascens</i>	Highfin chub			LC	widespread	no
Chub	<i>Kyphosus sectatrix</i>	Bermuda chub			LC	widespread	no
Clingfish	<i>Diademichthys lineatus</i>	Urchin clingfish			LC	Indo-Pacific	no
Clingfish	<i>Discotrema crinophilum</i>	Crinoid clingfish			LC	Indo-west Pacific	no
Clingfish	<i>Lepadichthys bolini</i>	Bolin's clingfish			LC	Indo-west Pacific	no
Clingfish	<i>Lepadichthys minor</i>	Dwarf clingfish			LC	Indo-Pacific	no
Codlet	<i>Bregmaceros nectabanus</i>	Smallscale codlet			LC	circumglobal	no
Collared wriggler	<i>Tyson belos</i>	Arrow wriggler			LC	western Pacific	no
Collared wriggler	<i>Xenisthmus eirosipilus</i>	Spotted wriggler			LC	southwest Pacific	no
Collared wriggler	<i>Xenisthmus chapmani</i>	Collared wriggler			DD	Vanuatu	no
Collared wriggler	<i>Xenisthmus clarus</i>	Clear wriggler			LC	western Pacific	no
Coral	<i>Acanthastrea amakusensis</i>	Mussid coral	II			Indo-west Pacific	no
Coral	<i>Acanthastrea bowerbanki</i>	Mussid coral	II		VU	Indo-west Pacific, rare	no
Coral	<i>Acanthastrea echinata</i>	Mussid coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Acanthastrea hillae</i>	Mussid coral	II		NT	Indo-west Pacific	no
Coral	<i>Acanthastrea ishigakiensis</i>	Mussid coral	II		VU	Indo-west Pacific, uncommon	no
Coral	<i>Acanthastrea rotundoflora</i>	Mussid coral	II		NT	Indo-west Pacific	no
Coral	<i>Acrhelia horrescens</i>	Oculinid coral	II			Indo-west Pacific	no
Coral	<i>Acropora abrotanoides</i>	Acropora coral	II		LC	widespread, reef	no
Coral	<i>Acropora aculeus</i>	Acropora coral	II		VU	central Indo-Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Coral	<i>Acropora anthocercis</i>	Acropora coral	II		VU	widespread, uncommon	no
Coral	<i>Acropora aspera</i>	Acropora coral	II		VU	widespread, uncommon	no
Coral	<i>Acropora auster</i>	Acropora coral	II		NT	Indo-Pacific	no
Coral	<i>Acropora brueggemanni</i>	Acropora coral	II			Indo-Pacific	no
Coral	<i>Acropora carduus</i>	Acropora coral	II		NT	widespread	no
Coral	<i>Acropora caroliniana</i>	Acropora coral	II		VU	central Indo-Pacific, uncommon	no
Coral	<i>Acropora cerealis</i>	Acropora coral	II		LC	widespread	no
Coral	<i>Acropora chesterfieldensis</i>	Acropora coral	II		LC	south Pacific, rare	no
Coral	<i>Acropora clathrata</i>	Acropora coral	II		LC	widespread	no
Coral	<i>Acropora copiosa</i>	Acropora coral	II		DD	rare	no
Coral	<i>Acropora crateriformis</i>	Acropora coral	II			Indo-Pacific	no
Coral	<i>Acropora cuneata</i>	Acropora coral	II			widespread	no
Coral	<i>Acropora cytherea</i>	Acropora coral	II		LC	widespread	no
Coral	<i>Acropora dendrum</i>	Acropora coral	II		VU	widespread, uncommon	no
Coral	<i>Acropora digitifera</i>	Acropora coral	II		NT	widespread, uncommon	no
Coral	<i>Acropora divaricata</i>	Acropora coral	II		NT	widespread	no
Coral	<i>Acropora donei</i>	Acropora coral	II		VU	widespread, uncommon	no
Coral	<i>Acropora echinata</i>	Acropora coral	II		VU	widespread, uncommon	no
Coral	<i>Acropora elseyi</i>	Acropora coral	II		LC	widespread	no
Coral	<i>Acropora exquisita</i>	Acropora coral	II		DD	central Indo-Pacific	no
Coral	<i>Acropora florida</i>	Acropora coral	II		NT	widespread	no
Coral	<i>Acropora formosa</i>	Staghorn coral	II		NT	widespread	no
Coral	<i>Acropora gemmifera</i>	Acropora coral	II		LC	widespread	no
Coral	<i>Acropora globiceps</i>	Acropora coral	II		VU	Indo-west Pacific and central Pacific	no
Coral	<i>Acropora grandis</i>	Acropora coral	II		LC	widespread	no
Coral	<i>Acropora granulosa</i>	Acropora coral	II		NT	widespread	no
Coral	<i>Acropora horrida</i>	Acropora coral	II		VU	widespread	no
Coral	<i>Acropora humilis</i>	Finger coral	II		NT	widespread	no
Coral	<i>Acropora hyacinthus</i>	Brush coral	II		NT	widespread	no
Coral	<i>Acropora inermis</i>	Acropora coral	II		DD	widespread, uncommon	no
Coral	<i>Acropora insignis</i>	Acropora coral	II		DD	Indo-west Pacific, uncommon	no
Coral	<i>Acropora intermedia</i>	Acropora coral	II			widespread	no
Coral	<i>Acropora kirstyae</i>	Acropora coral	II		VU	Indo-west Pacific, uncommon	no
Coral	<i>Acropora latistella</i>	Acropora coral	II		LC	widespread	no
Coral	<i>Acropora listeri</i>	Acropora coral	II		VU	widespread, uncommon	no
Coral	<i>Acropora longicyathus</i>	Acropora coral	II		LC	Indian Ocean, Indo-Pacific, Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Coral	<i>Acropora loripes</i>	Acropora coral	II		NT	widespread	no
Coral	<i>Acropora lovelli</i>	Acropora coral	II		VU	Indian Ocean, Indo-Pacific, Pacific	no
Coral	<i>Acropora lutkeni</i>	Acropora coral	II		NT	Indian Ocean, Indo-Pacific, Pacific	no
Coral	<i>Acropora microclados</i>	Acropora coral	II		VU	widespread, uncommon	no
Coral	<i>Acropora microphthalma</i>	Acropora coral	II		LC	widespread	no
Coral	<i>Acropora millepora</i>	Acropora coral	II		NT	widespread	no
Coral	<i>Acropora monticulosa</i>	Acropora coral	II		NT	Indian Ocean, Indo-Pacific, Pacific	no
Coral	<i>Acropora nana</i>	Acropora coral	II		NT	Indian Ocean, Indo-Pacific, Pacific	no
Coral	<i>Acropora nasuta</i>	Acropora coral	II		NT	widespread	no
Coral	<i>Acropora nobilis</i>	Acropora coral	II		LC	widespread	no
Coral	<i>Acropora palifera</i>	Acropora coral	II			widespread	no
Coral	<i>Acropora palmerae</i>	Acropora coral	II		VU	Indian Ocean, Indo-Pacific, Pacific, uncommon	no
Coral	<i>Acropora paniculata</i>	Acropora coral	II		VU	Indo-west Pacific, uncommon	no
Coral	<i>Acropora parilis</i>	Acropora coral	II		DD	Indo-west Pacific	no
Coral	<i>Acropora polystoma</i>	Acropora coral	II		VU	widespread, uncommon	no
Coral	<i>Acropora pulchra</i>	Acropora coral	II		LC	widespread, uncommon	no
Coral	<i>Acropora robusta</i>	Acropora coral	II		LC	widespread	no
Coral	<i>Acropora rosaria</i>	Acropora coral	II		DD	Indian Ocean, Indo-west Pacific, uncommon	no
Coral	<i>Acropora samoensis</i>	Acropora coral	II		LC	widespread	no
Coral	<i>Acropora sarmentosa</i>	Acropora coral	II		LC	Indo-Pacific	no
Coral	<i>Acropora secale</i>	Acropora coral	II		NT	widespread	no
Coral	<i>Acropora selago</i>	Acropora coral	II		NT	widespread, uncommon	no
Coral	<i>Acropora solitaryensis</i>	Acropora coral	II		VU	Indo-west Pacific	no
Coral	<i>Acropora speciosa</i>	Acropora coral	II		VU	Indo-Pacific, Pacific	no
Coral	<i>Acropora spicifera</i>	Acropora coral	II		VU	widespread	no
Coral	<i>Acropora subglabra</i>	Acropora coral	II		LC	Indian Ocean, Indo-west Pacific	no
Coral	<i>Acropora subulata</i>	Acropora coral	II		LC	widespread	no
Coral	<i>Acropora tenuis</i>	Acropora coral	II		NT	widespread	no
Coral	<i>Acropora tortuosa</i>	Acropora coral	II		LC	Indo-west Pacific and central Pacific	no
Coral	<i>Acropora tutuilensis</i>	Acropora coral	II		DD	widespread	no
Coral	<i>Acropora valenciennesi</i>	Acropora coral	II		LC	widespread	no
Coral	<i>Acropora valida</i>	Acropora coral	II		LC	widespread	no
Coral	<i>Acropora vaughani</i>	Acropora coral	II		VU	Indian Ocean, Indo-west Pacific, uncommon	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Coral	<i>Acropora verweyi</i>	Acropora coral	II		VU	Indian Ocean, Indo-west Pacific	no
Coral	<i>Acropora yongei</i>	Acropora coral	II		LC	Indian Ocean, Indo-west Pacific, central Pacific	no
Coral	<i>Acropora efflorescens</i>	Acropora coral	II		DD	Indo-Pacific	no
Coral	<i>Acropora mirabilis</i>	Acropora coral	II		DD	Indo-Pacific, uncommon	no
Coral	<i>Acropora multiacuta</i>	Acropora coral	II		VU	Indo-Pacific	no
Coral	<i>Acropora pichoni</i>	Acropora coral	II		NT	Indo-Pacific	no
Coral	<i>Acropora rambleri</i>	Acropora coral	II		DD	Indo-Pacific, rare	no
Coral	<i>Acropora tenella</i>	Acropora coral	II		VU	central and western Pacific	no
Coral	<i>Alveopora allingi</i>	Poritid coral	II		VU	Indo-west Pacific, Pacific, uncommon	no
Coral	<i>Alveopora fenestrata</i>	Poritid coral	II		VU	Indo-west Pacific, uncommon	no
Coral	<i>Alveopora ocellata</i>	Poritid coral	II		DD	Indo-west Pacific, rare	no
Coral	<i>Alveopora spongiosa</i>	Poritid coral	II		NT	Indo-west Pacific, Pacific, uncommon	no
Coral	<i>Alveopora verrilliana</i>	Poritid coral	II		VU	Indo-west Pacific, Pacific, uncommon	no
Coral	<i>Alveopora catalai</i>	Acroporid coral	II		NT	Indo-Pacific, uncommon	no
Coral	<i>Anacropora forbesi</i>	Acroporid coral	II		LC	Indo-Pacific	no
Coral	<i>Anacropora puertogalerae</i>	Acroporid coral	II		VU	Indo-Pacific, uncommon	no
Coral	<i>Anacropora reticulata</i>	Acroporid coral	II		VU	Central Indo-Pacific	no
Coral	<i>Astreopora cucullata</i>	Acroporid coral	II		VU	widespread, rare	no
Coral	<i>Astreopora gracilis</i>	Acroporid coral	II		LC	widespread	no
Coral	<i>Astreopora listeri</i>	Acroporid coral	II		LC	widespread	no
Coral	<i>Astreopora myriophthalma</i>	Acroporid coral	II		LC	widespread	no
Coral	<i>Astreopora randalli</i>	Acroporid coral	II		LC	Indo-west Pacific, uncommon	no
Coral	<i>Astreopora suggesta</i>	Acroporid coral	II		LC	widespread, uncommon	no
Coral	<i>Astreopora expansa</i>	Acroporid coral	II		NT	Indo-Pacific	no
Coral	<i>Astreopora macrostoma</i>	Acroporid coral	II		NT	Indo-Pacific	no
Coral	<i>Barabattoia amicorum</i>	Favid coral	II		LC	widespread, uncommon	no
Coral	<i>Barabattoia laddi</i>	Favid coral	II		VU	Indo-west Pacific	no
Coral	<i>Blastomussa wellsii</i>	Mussid coral	II		NT	Indo-west Pacific, uncommon	no
Coral	<i>Cantharellus jebbi</i>	Mushroom coral			LC	Indo-west Pacific	no
Coral	<i>Caryophyllia scobinosa</i>	Caryophyllid coral	II			widespread, uncommon	no
Coral	<i>Caulastrea furcata</i>	Favid coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Caulastrea curvata</i>	Favid coral	II		VU	Central Indo-Pacific	no
Coral	<i>Coeloseris mayeri</i>	Agaricid coral	II		LC	Indo-west Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Coral	<i>Coscinaraea columna</i>	Siderastrid coral	II		LC	widespread	no
Coral	<i>Coscinaraea exaesa</i>	Siderastrid coral	II		LC	Indo-west Pacific	no
Coral	<i>Coscinaraea wellsii</i>	Siderastrid coral	II		LC	widespread, uncommon	no
Coral	<i>Coscinaraea crassa</i>	Siderastrid coral	II		NT	Indo-Pacific	no
Coral	<i>Ctenactis albitentaculata</i>	Fungid coral	II		NT	Indo-Pacific, uncommon	no
Coral	<i>Ctenactis crassa</i>	Fungid coral	II		LC	Indo-west Pacific	no
Coral	<i>Ctenactis echinata</i>	Fungid coral	II		LC	widespread	no
Coral	<i>Cynarina lacrymalis</i>	Mussid coral	II		NT	Indo-west Pacific, uncommon	no
Coral	<i>Cyphastrea chalcidicum</i>	Favid coral	II		LC	widespread	no
Coral	<i>Cyphastrea decadia</i>	Favid coral	II		LC	Indo-west Pacific, Pacific, uncommon	no
Coral	<i>Cyphastrea microphthalma</i>	Favid coral	II		LC	widespread	no
Coral	<i>Cyphastrea serailia</i>	Favid coral	II		LC	widespread	no
Coral	<i>Cyphastrea ocellina</i>	Favid coral	II		VU	Central Indo-Pacific	no
Coral	<i>Diploastrea heliopora</i>	Favid coral	II		NT	widespread, uncommon	no
Coral	<i>Distichopora livida</i>	Distichopora species	II			Indo-west Pacific, rare	no
Coral	<i>Echinophyllia aspera</i>	Pectinid coral	II		LC	widespread	no
Coral	<i>Echinophyllia echinata</i>	Pectinid coral	II		LC	Indo-west Pacific, Pacific, rare	no
Coral	<i>Echinopora gemmacea</i>	Favid coral	II		LC	widespread	no
Coral	<i>Echinopora hirsutissima</i>	Favid coral	II		LC	widespread, uncommon	no
Coral	<i>Echinopora horrida</i>	Favid coral	II		NT	Indo-west Pacific, Pacific, uncommon	no
Coral	<i>Echinopora lamellosa</i>	Favid coral	II		LC	widespread	no
Coral	<i>Echinopora mammiformis</i>	Favid coral	II		NT	widespread	no
Coral	<i>Echinopora pacificus</i>	Favid coral	II		NT	Indo-Pacific	no
Coral	<i>Enallopsammia rostrata</i>	Dendrophyllid coral	II			widespread	no
Coral	<i>Euphyllia cristata</i>	Caryophyllid coral	II		VU	Indo-west Pacific, Pacific	no
Coral	<i>Euphyllia glabrescens</i>	Caryophyllid coral	II		NT	widespread	no
Coral	<i>Euphyllia paraancora</i>	Mussid coral	II		VU	Indo-west Pacific	no
Coral	<i>Euphyllia yaeyamaensis</i>	Mussid coral	II		NT	Central Indo-Pacific	no
Coral	<i>Favia danae</i>	Favid coral	II		LC	widespread, uncommon	no
Coral	<i>Favia fавus</i>	Favid coral	II		LC	widespread	no
Coral	<i>Favia helianthoides</i>	Favid coral	II		NT	widespread, uncommon	no
Coral	<i>Favia lizardensis</i>	Favid coral	II		NT	widespread, uncommon	no
Coral	<i>Favia maritima</i>	Favid coral	II		NT	widespread, uncommon	no
Coral	<i>Favia matthaii</i>	Favid coral	II		NT	widespread, uncommon	no
Coral	<i>Favia pallida</i>	Favid coral	II		LC	widespread	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Coral	<i>Favia rotumana</i>	Favid coral	II		LC	widespread	no
Coral	<i>Favia rotundata</i>	Favid coral	II		NT	Indo-west Pacific, uncommon	no
Coral	<i>Favia speciosa</i>	Favid coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Favia stelligera</i>	Favid coral	II		NT	Indo-west Pacific, Pacific	no
Coral	<i>Favia veroni</i>	Favid coral	II		NT	widespread, uncommon	no
Coral	<i>Favites abdita</i>	Favid coral	II		NT	Indo-west Pacific, Pacific	no
Coral	<i>Favites bestae</i>	Favid coral	II		NT	Indo-west Pacific, rare	no
Coral	<i>Favites chinensis</i>	Favid coral	II		NT	widespread	no
Coral	<i>Favites complanata</i>	Favid coral	II		NT	Indo-west Pacific, uncommon	no
Coral	<i>Favites flexuosa</i>	Favid coral	II		NT	widespread, uncommon	no
Coral	<i>Favites halicora</i>	Favid coral	II		NT	widespread	no
Coral	<i>Favites pentagona</i>	Favid coral	II		LC	widespread, uncommon	no
Coral	<i>Favites russelli</i>	Favid coral	II		NT	widespread, uncommon	no
Coral	<i>Fungia concinna</i>	Fungid coral	II		LC	widespread	no
Coral	<i>Fungia distorta</i>	Fungid coral	II		LC	widespread	no
Coral	<i>Fungia fragilis</i>	Fungid coral	II		LC	Indo-Pacific, uncommon	no
Coral	<i>Fungia fungites</i>	Fungid coral	II		NT	Indo-west Pacific, Pacific	no
Coral	<i>Fungia granulosa</i>	Fungid coral	II		LC	widespread	no
Coral	<i>Fungia hexagonalis</i>	Fungid coral	II		LC	Indo-west Pacific, rare	no
Coral	<i>Fungia horrida</i>	Fungid coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Fungia klunzingeri</i>	Fungid coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Fungia moluccensis</i>	Fungid coral	II		LC	Indo-west Pacific	no
Coral	<i>Fungia paumotensis</i>	Fungid coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Fungia repanda</i>	Fungid coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Fungia scruposa</i>	Fungid coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Fungia scutaria</i>	Fungid coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Fungia sinensis</i>	Fungid coral	II		LC	widespread, uncommon	no
Coral	<i>Fungia tenuis</i>	Fungid coral	II		LC	widespread	no
Coral	<i>Fungia vaughani</i>	Fungid coral	II		LC	widespread, uncommon	no
Coral	<i>Fungia scabra</i>	Fungid coral	II		LC	Indo-west Pacific	no
Coral	<i>Fungia somervillei</i>	Fungid coral	II		LC	Indo-west Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Coral	<i>Fungia spinifer</i>	Fungid coral	II		LC	Indo-west Pacific	no
Coral	<i>Galaxea astreata</i>	Oculinid coral	II		VU	Indo-west Pacific	no
Coral	<i>Galaxea fascicularis</i>	Oculinid coral	II		NT	Indo-west Pacific, Pacific	no
Coral	<i>Galaxea horrescens</i>	Oculinid coral	II		LC	Indo-west Pacific	no
Coral	<i>Galaxea achrhelia</i>	Oculinid coral	II		VU	Indo-west Pacific	no
Coral	<i>Galaxea paucisepta</i>	Oculinid coral	II		NT	Indo-west Pacific	no
Coral	<i>Gardineroseris planulata</i>	Agaricid coral	II		LC	widespread, uncommon	no
Coral	<i>Goniastrea aspera</i>	Favid coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Goniastrea australensis</i>	Favid coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Goniastrea edwardsi</i>	Favid coral	II		LC	Indo-west Pacific	no
Coral	<i>Goniastrea favulus</i>	Favid coral	II		NT	widespread, uncommon	no
Coral	<i>Goniastrea palauensis</i>	Favid coral	II		NT	Indo-west Pacific, uncommon	no
Coral	<i>Goniastrea pectinata</i>	Favid coral	II		LC	widespread	no
Coral	<i>Goniopora columna</i>	Poritid coral	II		NT	Indo-west Pacific	no
Coral	<i>Goniopora djiboutiensis</i>	Poritid coral	II		LC	Indo-west Pacific	no
Coral	<i>Goniopora lobata</i>	Poritid coral	II		NT	Indo-west Pacific	no
Coral	<i>Goniopora minor</i>	Poritid coral	II		NT	Indo-west Pacific, Pacific	no
Coral	<i>Goniopora pandoraensis</i>	Poritid coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Goniopora somaliensis</i>	Poritid coral	II		LC	Indo-west Pacific, Pacific, uncommon	no
Coral	<i>Goniopora stokesi</i>	Poritid coral	II		NT	Indo-west Pacific, uncommon	no
Coral	<i>Goniopora stutchburyi</i>	Poritid coral	II		LC	widespread, uncommon	no
Coral	<i>Goniopora tenuidens</i>	Poritid coral	II		LC	widespread	no
Coral	<i>Halomitra pileus</i>	Fungid coral	II		LC	Indo-west Pacific	no
Coral	<i>Heliofungia actiniformis</i>	Fungid coral	II		VU	Indo-west Pacific	no
Coral	<i>Heliopora coerulea</i>	Blue coral	I/II		VU	Indo-Pacific, Pacific	no
Coral	<i>Herpolitha limax</i>	Fungid coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Herpolitha weberi</i>	Fungid coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Heterocyathus aequicostatus</i>	Caryophyllid coral	II		LC	Indo-west Pacific	no
Coral	<i>Heteropsammia cochlea</i>	Dendrophyllid coral	II		LC	widespread	no
Coral	<i>Hydnophora exesa</i>	Merulinid coral	II		NT	widespread	no
Coral	<i>Hydnophora grandis</i>	Merulinid coral	II		LC	Indo-west Pacific, uncommon	no
Coral	<i>Hydnophora microconos</i>	Merulinid coral	II		NT	widespread	no
Coral	<i>Hydnophora pilosa</i>	Merulinid coral	II		LC	Indo-west Pacific, uncommon	no
Coral	<i>Hydnophora rigida</i>	Merulinid coral	II		LC	Indo-west Pacific, Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Coral	<i>Isopora palifera</i>	Catch bowl coral	II		NT	Indo-Pacific	no
Coral	<i>Leptastrea inaequalis</i>	Favid coral	II		NT	widespread, uncommon	no
Coral	<i>Leptastrea pruinosa</i>	Favid coral	II		LC	widespread	no
Coral	<i>Leptastrea purpurea</i>	Favid coral	II		LC	widespread	no
Coral	<i>Leptastrea transversa</i>	Favid coral	II		LC	widespread	no
Coral	<i>Leptoria phrygia</i>	Favid coral	II		NT	widespread	no
Coral	<i>Leptoseris explanata</i>	Agaricid coral	II		LC	widespread	no
Coral	<i>Leptoseris gardineri</i>	Agaricid coral	II		LC	Indo-west Pacific, uncommon	no
Coral	<i>Leptoseris hawaiiensis</i>	Agaricid coral	II		LC	Indo-west Pacific, Pacific, uncommon	no
Coral	<i>Leptoseris incrustans</i>	Agaricid coral	II		VU	Indo-west Pacific, Pacific, uncommon	no
Coral	<i>Leptoseris mycetoseroides</i>	Agaricid coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Leptoseris papyracea</i>	Agaricid coral	II		LC	widespread, uncommon	no
Coral	<i>Leptoseris scabra</i>	Agaricid coral	II		LC	widespread	no
Coral	<i>Leptoseris yabei</i>	Agaricid coral	II		VU	Indo-west Pacific, Pacific, uncommon	no
Coral	<i>Lithophyllon mokai</i>	Fungid coral	II		LC	Indo-west Pacific, uncommon	no
Coral	<i>Lobophyllia corymbosa</i>	Mussid coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Lobophyllia hataii</i>	Mussid coral	II		LC	Indo-west Pacific	no
Coral	<i>Lobophyllia hemprichii</i>	Mussid coral	II		LC	widespread	no
Coral	<i>Lobophyllia pachysepta</i>	Mussid coral	II		NT	Indo-west Pacific, uncommon	no
Coral	<i>Merulina ampliata</i>	Merulinid coral	II		LC	widespread	no
Coral	<i>Merulina scabricula</i>	Merulinid coral	II		LC	widespread	no
Coral	<i>Micromussa amakusensis</i>	Mussid coral	II		NT	Indo-west Pacific	no
Coral	<i>Millepora dichotoma</i>	Hydrozoan	II		LC	widespread	no
Coral	<i>Millepora exaesa</i>	Hydrozoan	II		LC	widespread	no
Coral	<i>Millepora platyphylla</i>	Fire coral	II		LC	widespread	no
Coral	<i>Millepora tenera</i>	Hydrozoan	II		LC	Indo-Pacific	no
Coral	<i>Millepora intricata</i>	Hydrozoan	II		LC	Indo-Pacific	no
Coral	<i>Millepora murrayi</i>	Hydrozoan	II		NT	Indo-west Pacific	no
Coral	<i>Montastrea annuligera</i>	Favid coral	II		NT	widespread, uncommon	no
Coral	<i>Montastrea curta</i>	Favid coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Montastrea magnistellata</i>	Favid coral	II		NT	widespread, uncommon	no
Coral	<i>Montastrea valenciennesi</i>	Favid coral	II		NT	Indo-west Pacific, uncommon	no
Coral	<i>Montastrea multipunctata</i>	Favid coral	II		VU	Central Indo-Pacific	no
Coral	<i>Montastrea salebrosa</i>	Favid coral	II		VU	Central Indo-Pacific	no
Coral	<i>Montipora aequituberculata</i>	Acroporid coral	II		LC	widespread	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Coral	<i>Montipora australiensis</i>	Acroporid coral	II		VU	Indo-west Pacific, rare	no
Coral	<i>Montipora caliculata</i>	Acroporid coral	II		VU	widespread, uncommon	no
Coral	<i>Montipora capitata</i>	Acroporid coral	II		NT	Indo-Pacific, Pacific	no
Coral	<i>Montipora capricornis</i>	Acroporid coral	II		VU	Indo-west Pacific, uncommon	no
Coral	<i>Montipora corbettensis</i>	Acroporid coral	II		VU	widespread, uncommon	no
Coral	<i>Montipora crassituberculata</i>	Acroporid coral	II		VU	Indo-west Pacific, uncommon	no
Coral	<i>Montipora danae</i>	Acroporid coral	II		LC	widespread	no
Coral	<i>Montipora digitata</i>	Acroporid coral	II		LC	widespread	no
Coral	<i>Montipora efflorescens</i>	Acroporid coral	II		NT	widespread, uncommon	no
Coral	<i>Montipora effusa</i>	Acroporid coral	II		NT	widespread, uncommon	no
Coral	<i>Montipora floweri</i>	Acroporid coral	II		LC	Indo-west Pacific, uncommon	no
Coral	<i>Montipora foliosa</i>	Acroporid coral	II		NT	Indo-west Pacific	no
Coral	<i>Montipora foveolata</i>	Acroporid coral	II		NT	widespread, uncommon	no
Coral	<i>Montipora grisea</i>	Acroporid coral	II		LC	widespread	no
Coral	<i>Montipora hispida</i>	Acroporid coral	II		LC	widespread	no
Coral	<i>Montipora hoffmeisteri</i>	Acroporid coral	II		LC	widespread	no
Coral	<i>Montipora incrassata</i>	Acroporid coral	II		NT	widespread, uncommon	no
Coral	<i>Montipora informis</i>	Acroporid coral	II		LC	Indo-west Pacific	no
Coral	<i>Montipora millepora</i>	Acroporid coral	II		LC	Indo-west Pacific	no
Coral	<i>Montipora mollis</i>	Acroporid coral	II		LC	widespread	no
Coral	<i>Montipora monasteriata</i>	Acroporid coral	II		LC	Indo-west Pacific	no
Coral	<i>Montipora nodosa</i>	Acroporid coral	II		NT	widespread, uncommon	no
Coral	<i>Montipora peltiformis</i>	Acroporid coral	II		NT	widespread, uncommon	no
Coral	<i>Montipora spongodes</i>	Acroporid coral	II		LC	widespread	no
Coral	<i>Montipora spumosa</i>	Acroporid coral	II		LC	Indo-west Pacific	no
Coral	<i>Montipora tuberculosa</i>	Acroporid coral	II		LC	Indo-west Pacific	no
Coral	<i>Montipora turgescens</i>	Acroporid coral	II		LC	Indo-west Pacific	no
Coral	<i>Montipora turtlensis</i>	Acroporid coral	II		VU	Indo-Pacific, uncommon	no
Coral	<i>Montipora undata</i>	Acroporid coral	II		NT	Indo-Pacific, uncommon	no
Coral	<i>Montipora venosa</i>	Acroporid coral	II		NT	Indo-west Pacific, uncommon	no
Coral	<i>Montipora verrucosa</i>	Acroporid coral	II		LC	Indo-west Pacific, uncommon	no
Coral	<i>Montipora altasepta</i>	Acroporid coral	II		VU	Central Indo-Pacific	no
Coral	<i>Montipora cebuensis</i>	Acroporid coral	II		VU	Central Indo-Pacific	no
Coral	<i>Montipora samarensis</i>	Acroporid coral	II		VU	Central Indo-Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Coral	<i>Mycedium elephantotus</i>	Pectinid coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Mycedium mancaoi</i>	Pectinid coral	II		LC	Indo-west Pacific, uncommon	no
Coral	<i>Oulophyllia bennettiae</i>	Favid coral	II		NT	widespread, uncommon	no
Coral	<i>Oulophyllia crispa</i>	Favid coral	II		NT	Indo-west Pacific, uncommon	no
Coral	<i>Oxypora glabra</i>	Pectinid coral	II		LC	Indo-west Pacific	no
Coral	<i>Oxypora lacera</i>	Pectinid coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Pachyseris rugosa</i>	Agaricid coral	II		VU	Indo-west Pacific	no
Coral	<i>Pachyseris speciosa</i>	Agaricid coral	II		LC	widespread	no
Coral	<i>Palauastrea ramosa</i>	Astrocoenid coral	II		NT	Indo-Pacific	no
Coral	<i>Paraclavaria triangularis</i>	Merulinid coral			NT	restricted	no
Coral	<i>Pavona bipartita</i>	Agaricid coral	II		VU	widespread, uncommon	no
Coral	<i>Pavona cactus</i>	Agaricid coral	II		VU	widespread	no
Coral	<i>Pavona clavus</i>	Agaricid coral	II		LC	widespread	no
Coral	<i>Pavona decussata</i>	Agaricid coral	II		VU	widespread	no
Coral	<i>Pavona duerdeni</i>	Agaricid coral	II		LC	widespread, uncommon	no
Coral	<i>Pavona explanulata</i>	Agaricid coral	II		LC	widespread	no
Coral	<i>Pavona maldivensis</i>	Agaricid coral	II		LC	widespread	no
Coral	<i>Pavona minuta</i>	Agaricid coral	II		NT	widespread	no
Coral	<i>Pavona varians</i>	Agaricid coral	II		LC	widespread	no
Coral	<i>Pavona venosa</i>	Agaricid coral	II		VU	Indo-west Pacific	no
Coral	<i>Pectinia alcicornis</i>	Pectinid coral	II		VU	Indo-west Pacific, uncommon	no
Coral	<i>Pectinia elongata</i>	Pectinid coral	II		NT	Indo-Pacific, uncommon	no
Coral	<i>Pectinia lactuca</i>	Pectinid coral	II		VU	Indo-west Pacific	no
Coral	<i>Pectinia paeonia</i>	Pectinid coral	II		NT	Indo-west Pacific	no
Coral	<i>Physogyra lichtensteini</i>	Caryophyllid coral	II		VU	widespread	no
Coral	<i>Platygyra contorta</i>	Favid coral	II		LC	widespread	no
Coral	<i>Platygyra daedalea</i>	Favid coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Platygyra lamellina</i>	Favid coral	II		NT	widespread, uncommon	no
Coral	<i>Platygyra pini</i>	Favid coral	II		LC	widespread	no
Coral	<i>Platygyra ryukyuensis</i>	Favid coral	II		NT	Indo-west Pacific, uncommon	no
Coral	<i>Platygyra sinensis</i>	Favid coral	II		LC	widespread	no
Coral	<i>Plerogyra simplex</i>	Caryophyllid coral	II		NT	Indo-west Pacific	no
Coral	<i>Plerogyra sinuosa</i>	Caryophyllid coral	II		NT	widespread	no
Coral	<i>Plesiastrea versipora</i>	Favid coral	II		LC	Indo-west Pacific, Pacific, uncommon	no
Coral	<i>Pocillopora damicornis</i>	Cauliflower coral	II		LC	widespread	no
Coral	<i>Pocillopora eydouxi</i>	Pocilloporid coral	II		NT	widespread	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Coral	<i>Pocillopora meandrina</i>	Pocilloporid coral	II		LC	widespread	no
Coral	<i>Pocillopora verrucosa</i>	Pocilloporid coral	II		LC	widespread	no
Coral	<i>Pocillopora woodjonesi</i>	Pocilloporid coral	II		LC	widespread, uncommon	no
Coral	<i>Pocillopora zelli</i>	Pocilloporid coral	II		LC	Oceanic west Pacific	no
Coral	<i>Podabacia crustacea</i>	Fungid coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Podabacia motuporensis</i>	Fungid coral	II		NT	Indo-west Pacific, uncommon	no
Coral	<i>Polyphyllia novaehiberniae</i>	Fungid coral	II		NT	oceanic west Pacific	no
Coral	<i>Polyphyllia talpina</i>	Fungid coral	II		LC	Indo-west Pacific	no
Coral	<i>Porites annae</i>	Poritid coral	II		NT	Indo-west Pacific	no
Coral	<i>Porites australiensis</i>	Poritid coral	II		LC	widespread	no
Coral	<i>Porites cylindrica</i>	Poritid coral	II		NT	Indo-west Pacific	no
Coral	<i>Porites horizontalata</i>	Poritid coral	II		VU	Indo-west Pacific, uncommon	no
Coral	<i>Porites latistellata</i>	Poritid coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Porites lichen</i>	Poritid coral	II		LC	widespread	no
Coral	<i>Porites lutea</i>	Poritid coral	II		LC	widespread	no
Coral	<i>Porites monticulosa</i>	Poritid coral	II		LC	widespread	no
Coral	<i>Porites murrayensis</i>	Poritid coral	II		NT	Indo-west Pacific, Pacific, uncommon	no
Coral	<i>Porites nigrescens</i>	Poritid coral	II		VU	Indo-west Pacific, Pacific, uncommon	no
Coral	<i>Porites rus</i>	Poritid coral	II		LC	widespread	no
Coral	<i>Porites solida</i>	Poritid coral	II		LC	widespread	no
Coral	<i>Porites vaughani</i>	Poritid coral	II		LC	Indo-west Pacific, Pacific, uncommon	no
Coral	<i>Porites attenuata</i>	Poritid coral	II		VU	central Indo-Pacific	no
Coral	<i>Porites deformis</i>	Poritid coral	II		NT	central Indo-Pacific	no
Coral	<i>Porites densa</i>	Poritid coral	II		NT	central Indo-Pacific	no
Coral	<i>Porites latistella</i>	Poritid coral	II		LC	Indo-Pacific	no
Coral	<i>Porites myrmidonensis</i>	Poritid coral	II		LC	western Pacific	no
Coral	<i>Porites stephensoni</i>	Poritid coral	II		NT	Indo-Pacific	no
Coral	<i>Psammocora contigua</i>	Siderastrid coral	II		NT	widespread	no
Coral	<i>Psammocora digitata</i>	Siderastrid coral	II		NT	widespread	no
Coral	<i>Psammocora explanulata</i>	Siderastrid coral	II		LC	widespread	no
Coral	<i>Psammocora haimeana</i>	Siderastrid coral	II		LC	widespread	no
Coral	<i>Psammocora nierstraszi</i>	Siderastrid coral	II		LC	widespread	no
Coral	<i>Psammocora profundacella</i>	Siderastrid coral	II		LC	widespread	no
Coral	<i>Psammocora superficialis</i>	Siderastrid coral	II		LC	widespread	no
Coral	<i>Psammocora vaughani</i>	Siderastrid coral	II		NT	western Pacific	no
Coral	<i>Pseudosiderastrea tayami</i>	Siderastrid coral	II		NT	Indo-Pacific	no
Coral	<i>Sandalolitha dentata</i>	Fungid coral	II		LC	Indo-west Pacific, Pacific, uncommon	no
Coral	<i>Sandalolitha robusta</i>	Fungid coral	II		LC	Indo-west Pacific, Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Coral	<i>Scapophyllia cylindrica</i>	Merulinid coral	II		LC	Indo-west Pacific, Pacific, uncommon	no
Coral	<i>Scolymia vitiensis</i>	Mussid coral	II		NT	widespread, uncommon	no
Coral	<i>Seriatopora caliendrum</i>	Birdnest coral	II		NT	Indo-west Pacific, uncommon	no
Coral	<i>Seriatopora hystrix</i>	Thin birdsnest coral	II		LC	Indo-west Pacific, Pacific	no
Coral	<i>Seriatopora stellata</i>	Pocilloporid coral	II		NT	Indo-west Pacific, uncommon	no
Coral	<i>Seriatopora aculeata</i>	Pocilloporid coral	II		VU	central Indo-Pacific	no
Coral	<i>Siderastrea savignyana</i>	Siderastrid coral	II		LC	Indo-Pacific	no
Coral	<i>Stylocoeniella armata</i>	Astrocoenid coral	II		LC	widespread	no
Coral	<i>Stylocoeniella guentheri</i>	Astrocoenid coral	II		LC	widespread	no
Coral	<i>Stylophora pistillata</i>	Smooth cauliflower coral	II		NT	Indo-west Pacific, Pacific	no
Coral	<i>Stylophora subseriata</i>	Pocilloporid coral	II		LC	Indo-west Pacific	no
Coral	<i>Symphyllia agaricia</i>	Mussid coral	II		LC	Indo-west Pacific	no
Coral	<i>Symphyllia radians</i>	Mussid coral	II		LC	Indo-west Pacific	no
Coral	<i>Symphyllia recta</i>	Mussid coral	II		LC	Indo-west Pacific	no
Coral	<i>Symphyllia valenciennesii</i>	Mussid coral	II		LC	Indo-west Pacific	no
Coral	<i>Trachyphyllia geoffroyi</i>	Trachyphyllid coral	II		NT	Indo-west Pacific, uncommon	no
Coral	<i>Tubipora musica</i>	Organ pipe coral	II		NT	widespread	no
Coral	<i>Turbinaria frondens</i>	Dendrophyllid coral	II		LC	widespread	no
Coral	<i>Turbinaria mesenterina</i>	Dendrophyllid coral	II		VU	widespread	no
Coral	<i>Turbinaria patula</i>	Dendrophyllid coral	II		VU	Indo-west Pacific, uncommon	no
Coral	<i>Turbinaria peltata</i>	Dendrophyllid coral	II		VU	widespread	no
Coral	<i>Turbinaria stellulata</i>	Dendrophyllid coral	II		VU	widespread, uncommon	no
Coral	<i>Zoopilus echinatus</i>	Fungid coral	II		LC	Indo-west Pacific, uncommon	no
Cormorant	<i>Microcarbo melanoleucos</i>	Little pied cormorant			LC	25700000	no
Crake	<i>Amauornis cinerea</i>	White-browed crake			LC	32500000	no
Crustacean	<i>Birgus latro</i>	Cocounut crab			DD	Indo-Pacific	no
Crustacean	<i>Galearctus timidus</i>	Lobster			LC	widespread, deep	no
Crustacean	<i>Nupalirus vericeli</i>	Polynesian furrow lobster			DD	French Polynesia, Vanuatu	no
Crustacean	<i>Panulirus longipes</i>	Longlegged spiny lobster			LC	Indian Ocean, Indo-Pacific	no
Crustacean	<i>Panulirus penicillatus</i>	Pronghorn spiny lobster			LC	widespread	no
Crustacean	<i>Parribacus caledonicus</i>	Caledonian mitten lobster			LC	Indo-west Pacific	no
Crustacean	<i>Parribacus antarcticus</i>	Sculptured mitten lobster			LC	widespread	no
Crustacean	<i>Pentacheles obscurus</i>	Decapod			LC	Indo-Pacific	no
Crustacean	<i>Petractus brevicornis</i>	Blue-back locust lobster			LC	Indo-Pacific	no
Crustacean	<i>Petractus holthuisi</i>	Decapod			LC	Philippines, Vanuatu	no
Crustacean	<i>Polycheles coccifer</i>	Decapod			LC	western Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Crustacean	<i>Scammarctus batei</i>	Soft locust lobster			LC	Indo-Pacific	no
Crustacean	<i>Stereomastis aculeata</i>	Decapod			LC	western Pacific	no
Crustacean	<i>Stereomastis galil</i>	Decapod			LC	restricted	no
Cusk-eel	<i>Abyssobrotula galatheae</i>	Cusk-eel			LC	cosmopolitan, deep waters	no
Cusk-eel	<i>Acanthonus armatus</i>	Bony-eared assfish			LC	circumglobal, deep	no
Cusk-eel	<i>Bassozetus compressus</i>	Abyssal cusk-eel			LC	widespread, deep	no
Cusk-eel	<i>Diancistrus novaeguineae</i>	New Guinea viviparous brotula			LC	western central Pacific	no
Cusk-eel	<i>Spectrunculus grandis</i>	Giant cusk-eel			LC	circumglobal, deep	no
Cutlassfish	<i>Trichiurus lepturus</i>	Common hairtail			LC	circumglobal	no
Damselfish	<i>Abudefduf septemfasciatus</i>	Seven-banded sergeant			LC	Indo-Pacific	no
Damselfish	<i>Abudefduf sexfasciatus</i>	Scissortail sergeant			LC	Indo-Pacific	no
Damselfish	<i>Abudefduf sordidus</i>	Blackspot sergeant			LC	Indo-Pacific	no
Damselfish	<i>Abudefduf vaigiensis</i>	Five-banded sergeant			LC	Indo-Pacific	no
Damselfish	<i>Acanthochromis polyacanthus</i>	Spiny chromis			LC	Indo-Australian archipelago	no
Damselfish	<i>Amblyglyphidodon aureus</i>	Golden damsel			LC	Indo-Pacific	no
Damselfish	<i>Amblyglyphidodon leucogaster</i>	White-breasted sergeant-major			LC	Indo-Pacific	no
Damselfish	<i>Amblyglyphidodon ternatensis</i>	Ternate damsel			VU	Coral Triangle	no
Damselfish	<i>Amphiprion melanopus</i>	Black anemonefish			LC	Indo-west Pacific	no
Damselfish	<i>Amphiprion percula</i>	Clown anemonefish			LC	Indo-west Pacific	no
Damselfish	<i>Amphiprion perideraion</i>	Pink anemonefish			LC	western Pacific	no
Damselfish	<i>Amphiprion sandaracinos</i>	Orange skunk clownfish			LC	Indo-Pacific	no
Damselfish	<i>Chromis alpha</i>	Yellow-speckled chromis			LC	Indo-Pacific	no
Damselfish	<i>Chromis amboinensis</i>	Ambon chromis			LC	Coral Triangle	no
Damselfish	<i>Chromis analis</i>	Yellow chromis			LC	western Pacific	no
Damselfish	<i>Chromis atripes</i>	Dark-fin chromis			LC	western Pacific	no
Damselfish	<i>Chromis caudalis</i>	Blue-axil chromis			LC	Indo-Pacific	no
Damselfish	<i>Chromis delta</i>	Deep reef chromis			LC	western Pacific	no
Damselfish	<i>Chromis elerae</i>	Twin-spot chromis			LC	Indo-Pacific	no
Damselfish	<i>Chrysiptera unimaculata</i>	One-spot demoiselle			LC	Indo-Pacific	no
Damselfish	<i>Neopomacentrus taeniurus</i>	Freshwater damsel			DD	Indo-Pacific	no
Dartfish	<i>Nemateleotris magnifica</i>	Fire dartfish			LC	Indo-Pacific	no
Dartfish	<i>Ptereleotris evides</i>	Blackfin dartfish			LC	Indian Ocean, Indo-Pacific	no
Dartfish	<i>Ptereleotris heteroptera</i>	Blacktail goby			LC	Indian Ocean, Indo-Pacific	no
Dolphin	<i>Globicephala macrorhynchus</i>	Short-finned pilot whale	II		DD	tropical, warm subtropical, deep waters	unknown
Dolphin	<i>Peponocephala electra</i>	Melon-headed whale	II		LC	circumtropical	no
Dolphin	<i>Stenella attenuata</i>	Pantropical spotted dolphin	II	II	LC	circumtropical	no
Dolphin	<i>Stenella coeruleoalba</i>	Striped dolphin	II	II	LC	widespread	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Dolphin	<i>Stenella longirostris</i>	Spinner dolphin	II	II	DD	circumtropical and subtropical	unknown
Dolphin	<i>Tursiops truncatus</i>	Common bottlenose dolphin	II	I/II	LC	circumglobal	no
Dolphinfish	<i>Coryphaena hippurus</i>	Dolphinfish			LC	widespread	yes
Dottyback	<i>Cypho purpurascens</i>	Oblique-lined dottyback			LC	restricted	no
Dottyback	<i>Lubbockichthys multisquamatus</i>	Manyscaled dottyback			LC	Indo-Pacific	no
Dottyback	<i>Pseudochromis cyanotaenia</i>	Bluebarred dottyback			LC	western Pacific	no
Dottyback	<i>Pseudochromis jamesi</i>	Spot-tail dottyback			LC	south-west Pacific	no
Dottyback	<i>Pseudochromis marshallensis</i>	Marshall dottyback			LC	western Pacific	no
Dottyback	<i>Pseudochromis tapeinosoma</i>				LC	Indo-Pacific	no
Dottyback	<i>Pseudoplesiops annae</i>	Anna's dottyback			LC	western Pacific	no
Dottyback	<i>Pseudoplesiops rosae</i>	Rose Island dottyback			LC	Indo-Pacific	no
Dottyback	<i>Pseudoplesiops wassi</i>	Fleckfin dottyback			LC	western Pacific	no
Dragonfish	<i>Aristostomias lunifer</i>	Dragonfish			LC	circumglobal, deep	no
Dragonfish	<i>Astronesthes indicus</i>	Dragonfish			LC	circumglobal, deep	no
Dragonfish	<i>Eurypegasus draconis</i>	Short dragonfish			LC	widespread	no
Dragonfish	<i>Eustomias braueri</i>	Dragonfish			DD	widespread, deep	no
Dragonfish	<i>Eustomias macrurus</i>	Scaleless dragonfish			LC	circumglobal, deep	no
Dragonfish	<i>Eustomias satterleei</i>	Dragonfish			LC	Subtropical, temperate, deep	no
Dragonfish	<i>Eustomias simplex</i>	Dragonfish			LC	Subtropical, temperate, deep	no
Dragonfish	<i>Flagellostomias boureei</i>	Longbarb dragonfish			LC	circumglobal, deep	no
Dragonfish	<i>Idiacanthus fasciola</i>	Black dragonfish			LC	circumglobal, temperate, subtropical	no
Dragonfish	<i>Malacosteus niger</i>	Black loosejaw			LC	circumglobal, deep	no
Dragonfish	<i>Melanostomias melanops</i>	Dragonfish			LC	circumglobal, deep	no
Dragonfish	<i>Melanostomias valdiviae</i>	Valdivia black dragonfish			LC	circumglobal, deep	no
Dragonfish	<i>Photonectes margarita</i>	Dragonfish			LC	widespread, deep	no
Dragonfish	<i>Photonectes parvimanus</i>	Dragonfish			LC	Subtropical, temperate, deep	no
Dragonfish	<i>Stomias affinis</i>	Dragonfish			LC	circumglobal, deep	no
Dragonfish	<i>Thysanactis dentex</i>	Dragonfish			LC	widespread, deep	no
Driftfish	<i>Cubiceps capensis</i>	Cape cigarfish			LC	circumtropical, rare	no
Driftfish	<i>Cubiceps pauciradiatus</i>	Bigeye cigarfish			LC	widespread, deep	no
Driftfish	<i>Nomeus gronovii</i>	Man-of-war fish			LC	circumglobal, deep	no
Driftfish	<i>Psenes cyanophrys</i>	Freckled driftfish			LC	circumglobal	no
Driftfish	<i>Psenes pellucidus</i>	Bluefin driftfish			LC	circumglobal	no
Driftfish	<i>Psenes arafurensis</i>	Banded driftfish			LC	circumglobal	no
Duck	<i>Anas superciliosa</i>	Pacific black duck			LC	49800000	no
Eel	<i>Anguilla obscura</i>	Pacific shortfin eel			LC	Pacific	yes
Eel	<i>Anguilla marmorata</i>	Marbled eel			LC	western and central Pacific, Indian Ocean	yes

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Eel	<i>Lamnostoma orientalis</i>	Oriental worm eel			LC	Indo-Pacific	no
Eel	<i>Lamnostoma polyophthalma</i>	Ocellated sand eel			LC	Indo-Pacific	no
Eel	<i>Nemichthys curvirostris</i>	Spotted snipe eel			LC	widespread, deep	no
Eel	<i>Nemichthys scolopaceus</i>	Slender snipe eel			LC	circumglobal, deep	yes
Eel	<i>Stemonidium hypomelas</i>	Black sawtooth eel			LC	Pacific, deep	no
Emperor	<i>Gnathodentex aureolineatus</i>	Goldspot emperor			LC	widespread	no
Emperor	<i>Gymnocranius euanus</i>	Japanese large-eyed bream			LC	western Pacific	no
Emperor	<i>Gymnocranius grandoculis</i>	Blue-lined large-eye bream			LC	Indo-west Pacific	no
Emperor	<i>Lethrinus atkinsoni</i>	Pacific yellowtail emperor			LC	Indo-west Pacific	no
Emperor	<i>Lethrinus nebulosus</i>	Spangled emperor			LC	Indo-west Pacific	no
Emperor	<i>Lethrinus rubrioperculatus</i>	Spotcheek emperor			LC	Indo-west Pacific	no
Emperor	<i>Lethrinus xanthochilus</i>	Yellowlip emperor			LC	Indo-west Pacific	no
Emperor	<i>Lethrinus amboinensis</i>	Ambon emperor			LC	Indo-Pacific	no
Emperor	<i>Lethrinus erythracanthus</i>	Orange-spotted emperor			LC	Indo-west Pacific	no
Emperor	<i>Lethrinus harak</i>	Thumbprint emperor			LC	Indo-west Pacific	no
Emperor	<i>Lethrinus lentjan</i>	Pinkear emperor			LC	Indo-Pacific	no
Emperor	<i>Lethrinus obsoletus</i>	Orange-striped emperor			LC	Indo-west Pacific	no
Emperor	<i>Lethrinus olivaceus</i>	Longnose emperor			LC	Indo-west Pacific	no
Emperor	<i>Lethrinus semicinctus</i>	Black-spot emperor			LC	Indo-Pacific	no
Emperor	<i>Lethrinus variegatus</i>	Slender emperor			LC	Indo-west Pacific	no
Emperor	<i>Monotaxis grandoculis</i>	Bigeye bream			LC	Indo-west Pacific	no
Emperor	<i>Monotaxis heterodon</i>	Redfin emperor			LC	Indo-west Pacific	no
Fangtooth	<i>Anoplogaster cornuta</i>	Common fangtooth			LC	widespread, deep	no
Filefish	<i>Aluterus monoceros</i>	Unicorn leatherjacket			LC	widespread	no
Filefish	<i>Amanses scopas</i>	Broom leatherjacket			LC	Indo-west Pacific	no
Filefish	<i>Cantherhines dumerilii</i>	Whitespotted filefish			LC	Indo-Pacific	no
Filefish	<i>Cantherhines pardalis</i>	Honeycomb filefish			LC	widespread	no
Filefish	<i>Lagocephalus suezensis</i>	Leatherjacket			LC	Indo-Pacific	no
Filefish	<i>Oxymonacanthus longirostris</i>	Harlequin filefish			VU	Indo-west Pacific	no
Filefish	<i>Paraluteres prionurus</i>	Blacksaddled leatherjacket			LC	Indo-Pacific	no
Filefish	<i>Pervagor janthinosoma</i>	Ear-spot filefish			LC	Indo-west Pacific	no
Filefish	<i>Pervagor melanocephalus</i>	Redtail filefish			LC	western Pacific	no
Fingerfish	<i>Monodactylus argenteus</i>	Silver moony			LC	Indo-Pacific	no
Flathead	<i>Cociella punctata</i>	Spotted flathead			LC	western central Pacific	no
Flathead	<i>Cymbacephalus beauforti</i>	Crocodile fish			LC	western Pacific	no
Flathead	<i>Onigocia oligolepis</i>	Largescaled flathead			LC	Indo-Pacific	no
Flathead	<i>Sunagocia otaitensis</i>	Fringelip flathead			LC	Indo-west Pacific	no
Flathead	<i>Thysanophrys chiltonae</i>	Longsnout flathead			LC	Indo-west Pacific	no
Flounder	<i>Engyprosopon vanuatuensis</i>	Lefteye flounder			DD	Vanuatu	no
Flutemouth	<i>Aulostomus chinensis</i>	Flutemouth			LC	widespread	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Flutemouth	<i>Fistularia commersonii</i>	Flutemouth			LC	Indo-Pacific	no
Flutemouth	<i>Fistularia petimba</i>	Red cornetfish			LC	Indo-Pacific	no
Flying fish	<i>Cheilopogon furcatus</i>	Spotfin flying fish			LC	circumtropical	no
Flying fish	<i>Cheilopogon heterurus</i>	Blotchwing flying fish			LC	widespread	no
Flying fish	<i>Exocoetus volitans</i>	Two-winged flying fish			LC	circumtropical	yes
Flying fish	<i>Hirundichthys speculiger</i>	Black-finned flying fish			LC	circumtropical	yes
Flying gurnard	<i>Dactyloptera orientalis</i>	Oriental flying gurnard			LC	Indo-west Pacific	no
Frigatebird	<i>Fregata ariel</i>	Lesser frigatebird			LC	167000000	no
Frigatebird	<i>Fregata minor</i>	Great frigatebird			LC	126000000	no
Frogfish	<i>Antennatus nummifer</i>	Spotfin frogfish			LC	widespread, deep	no
Fusilier	<i>Caesio caerulea</i>	Blue and gold fusilier			LC	Indo-west Pacific	no
Fusilier	<i>Caesio lunaris</i>	Lunar fusilier			LC	Indo-west Pacific	no
Fusilier	<i>Caesio teres</i>	Yellow and blueback fusilier			LC	Indo-west Pacific	no
Fusilier	<i>Gymnocaesio gymnoptera</i>	Slender fusilier			LC	Indo-west Pacific	no
Fusilier	<i>Pterocaesio digramma</i>	Double-lined fusilier			LC	Indo-Pacific	no
Fusilier	<i>Pterocaesio tile</i>	Dark-banded fusilier			LC	Indian Ocean, Indo-Pacific	no
Fusilier	<i>Pterocaesio trilineata</i>	Three-lined fusilier			LC	western Pacific	no
Fusilier	<i>Pterocaesio pisang</i>	Banana fusilier			LC	Indo-Pacific	no
Fusilier	<i>Pterocaesio tessellata</i>	Onestripe fusilier			LC	Indo-Pacific	no
Gastropod	<i>Cerithium coralium</i>	Coral cerith			LC	Indo-west Pacific	no
Gastropod	<i>Conus litoglyphus</i>	Lythograph cone			LC	Indo-Pacific	no
Gastropod	<i>Conus lividus</i>	Livid cone			LC	Indo-Pacific	no
Gastropod	<i>Conus terebra</i>	Cone snail			LC	Indo-Pacific	no
Gastropod	<i>Conus achatinus</i>	Turtle cone			LC	Indo-Pacific	no
Gastropod	<i>Conus adamsonii</i>	Rhododendron cone			LC	Central Indo-Pacific	no
Gastropod	<i>Conus aphrodite</i>	Cone snail			LC	restricted, deep	no
Gastropod	<i>Conus arenatus</i>	Sand-dusted cone			LC	Indo-Pacific	no
Gastropod	<i>Conus artoptus</i>	Tender cone			LC	Coral Triangle	no
Gastropod	<i>Conus aulicus</i>	Court cone			LC	Indo-Pacific	no
Gastropod	<i>Conus aureus</i>	Aureus cone			LC	Indo-Pacific	no
Gastropod	<i>Conus auricomus</i>	Gold-leaf cone			LC	Indo-Pacific	no
Gastropod	<i>Conus balteatus</i>	Mauritian cone			LC	Indo-Pacific	no
Gastropod	<i>Conus bandanus</i>	Banded marble cone			LC	Indo-Pacific	no
Gastropod	<i>Conus boucheti</i>	Cone snail			LC	Fiji, New Caledonia, Vanuatu	no
Gastropod	<i>Conus bullatus</i>	Bubble cone			LC	Indo-Pacific	no
Gastropod	<i>Conus canonicus</i>	Tiger cone			LC	Indo-Pacific	no
Gastropod	<i>Conus capitaneus</i>	Captain cone			LC	Indo-Pacific	no
Gastropod	<i>Conus catus</i>	Cat cone			LC	Indo-Pacific	no
Gastropod	<i>Conus chaldaeus</i>	Worm cone			LC	Indo-Pacific	no
Gastropod	<i>Conus cinereus</i>	Sunburnt cone			LC	western Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Gastropod	<i>Conus circumactus</i>	Cone snail			LC	Indo-Pacific	no
Gastropod	<i>Conus circumcisis</i>	Auger cone			LC	western Pacific	no
Gastropod	<i>Conus coccineus</i>	Scarlet cone			LC	Coral Triangle	no
Gastropod	<i>Conus coffeae</i>	Coffee cone			LC	western and central Pacific	no
Gastropod	<i>Conus comatosa</i>	Comatose cone			LC	western Pacific	no
Gastropod	<i>Conus consors</i>	Singed cone			LC	Indo-Pacific	no
Gastropod	<i>Conus coronatus</i>	Crowned cone			LC	Indo-Pacific	no
Gastropod	<i>Conus crocatus</i>	Saffron cone			LC	western Pacific	no
Gastropod	<i>Conus cylindraceus</i>	Cylindrical cone			LC	Indian Ocean, western Pacific	no
Gastropod	<i>Conus distans</i>	Distant cone			LC	Indo-Pacific	no
Gastropod	<i>Conus ebraeus</i>	Black-and-white cone			LC	Indo-Pacific	no
Gastropod	<i>Conus eburneus</i>	Ivory cone			LC	Indo-Pacific	no
Gastropod	<i>Conus emaciatu</i>	False virgin cone			LC	Indo-Pacific	no
Gastropod	<i>Conus episcopatus</i>	Dignified cone			LC	Indo-Pacific	no
Gastropod	<i>Conus ferrugineus</i>	Cone snail			LC	Central Indo-Pacific	no
Gastropod	<i>Conus figulinus</i>	Fig cone			LC	Indo-Pacific	no
Gastropod	<i>Conus flavidus</i>	Yellow Pacific cone			LC	Indo-Pacific	no
Gastropod	<i>Conus floccatus</i>	Snow-flaked cone			LC	Coral Triangle	no
Gastropod	<i>Conus floridulus</i>	Cone snail			LC	Central Indo-Pacific	no
Gastropod	<i>Conus frigidus</i>	Frigid cone			LC	Central and western Pacific	no
Gastropod	<i>Conus generalis</i>	General cone			LC	Indo-Pacific	no
Gastropod	<i>Conus geographus</i>	Geography cone			LC	Indo-Pacific	no
Gastropod	<i>Conus glans</i>	Acorn cone			LC	Indo-Pacific	no
Gastropod	<i>Conus glaucus</i>	Glaucous cone			LC	Coral Triangle	no
Gastropod	<i>Conus imperialis</i>	Imperial cone			LC	Indo-Pacific	no
Gastropod	<i>Conus legatus</i>	Ambassador cone			LC	Indo-Pacific	no
Gastropod	<i>Conus leopardus</i>	Leopard cone			LC	Indo-Pacific	no
Gastropod	<i>Conus lienardi</i>	Lienard's cone			LC	Coral Triangle	no
Gastropod	<i>Conus litteratus</i>	Lettered cone			LC	Indo-Pacific	no
Gastropod	<i>Conus magus</i>	Magical cone			LC	Indo-Pacific	no
Gastropod	<i>Conus marmoreus</i>	Marbled cone			LC	Coral Triangle	no
Gastropod	<i>Conus miles</i>	Soldier cone			LC	Indo-Pacific	no
Gastropod	<i>Conus miliaris</i>	Thousand-spot cone			LC	Indo-Pacific	no
Gastropod	<i>Conus mitratus</i>	Mitred cone			LC	Indo-Pacific	no
Gastropod	<i>Conus moluccensis</i>	Molucca cone			LC	Indian Ocean, western Pacific	no
Gastropod	<i>Conus monachus</i>	Supreme cone			LC	Coral Triangle	no
Gastropod	<i>Conus moreleti</i>	Cone snail			LC	Indian Ocean, western Pacific	no
Gastropod	<i>Conus mucronatus</i>	Deep-groved cone			LC	Coral Triangle	no
Gastropod	<i>Conus muriculatus</i>	Muricate cone			LC	Indo-Pacific	no
Gastropod	<i>Conus musicus</i>	Music cone			LC	Central Indo-Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Gastropod	<i>Conus mustelinus</i>	Ermine cone			LC	Indo-Pacific	no
Gastropod	<i>Conus neptunus</i>	Neptune cone			LC	Coral Triangle	no
Gastropod	<i>Conus nimbosus</i>	Stormy cone			LC	Indo-Pacific	no
Gastropod	<i>Conus nussatella</i>	Nussatella cone			LC	Indo-Pacific	no
Gastropod	<i>Conus obscurus</i>	Obscure cone			LC	Indo-Pacific	no
Gastropod	<i>Conus ochroleucus</i>	Perfect cone			LC	Coral Triangle	no
Gastropod	<i>Conus omaria</i>	Omaria cone			LC	Indo-Pacific	no
Gastropod	<i>Conus parius</i>	Parian cone			LC	Coral Triangle	no
Gastropod	<i>Conus pertusus</i>	Lovely cone			LC	Indo-Pacific	no
Gastropod	<i>Conus planorbis</i>	Ringed cone			LC	Indo-Pacific	no
Gastropod	<i>Conus praececellens</i>	Admirable cone			LC	Indo-Pacific	no
Gastropod	<i>Conus proximus</i>	Proximus cone			LC	western Pacific	no
Gastropod	<i>Conus pulicarius</i>	Flea cone			LC	Central and western Pacific	no
Gastropod	<i>Conus quercinus</i>	Oak cone			LC	Indo-Pacific	no
Gastropod	<i>Conus rattus</i>	Rat cone			LC	Indo-Pacific	no
Gastropod	<i>Conus retifer</i>	Netted cone			LC	Indo-Pacific	no
Gastropod	<i>Conus sanguinolentus</i>	Blood-stained cone			LC	Indo-Pacific	no
Gastropod	<i>Conus sponsalis</i>	Sponsal cone			LC	Indo-Pacific	no
Gastropod	<i>Conus striatellus</i>	Cone snail			LC	Indo-west Pacific	no
Gastropod	<i>Conus striatus</i>	Striated cone			LC	Indo-Pacific	no
Gastropod	<i>Conus striolatus</i>	Cone snail			LC	western Pacific	no
Gastropod	<i>Conus sulcatus</i>	Grooved cone			LC	Indo-Pacific	no
Gastropod	<i>Conus tessulatus</i>	Tessellated cone			LC	Indo-Pacific	no
Gastropod	<i>Conus textile</i>	Textile cone			LC	Indo-Pacific	no
Gastropod	<i>Conus tulipa</i>	Tulip cone			LC	Indo-Pacific	no
Gastropod	<i>Conus varius</i>	Freckled cone			LC	Indo-Pacific	no
Gastropod	<i>Conus vexillum</i>	Flag cone			LC	Indo-Pacific	no
Gastropod	<i>Conus virgo</i>	Cone snail			LC	Indo-Pacific	no
Gastropod	<i>Neritilia vulgaris</i>	Gastropod			LC	Pacific	no
Glassfish	<i>Ambassis interrupta</i>	Long-spined glassfish			LC	Indo-west Pacific	no
Goatfish	<i>Mulloidichthys flavolineatus</i>	Yellowstripe goatfish			LC	Indo-west Pacific	no
Goatfish	<i>Mulloidichthys vanicolensis</i>	Yellowfin goatfish			LC	Indo-Pacific	no
Goatfish	<i>Parupeneus barberinoides</i>	Bicolor goatfish			LC	Indo-west Pacific	no
Goatfish	<i>Parupeneus barnerinus</i>	Dash-and-dot goatfish			LC	Indo-Pacific	no
Goatfish	<i>Parupeneus ciliatus</i>	Whitesaddle goatfish			LC	Indian Ocean, Indo-Pacific	no
Goatfish	<i>Parupeneus cyclostomus</i>	Goldsaddle goatfish			LC	Indo-west Pacific	no
Goatfish	<i>Parupeneus heptacanthus</i>	Cinnabar goatfish			LC	Indo-west Pacific	no
Goatfish	<i>Parupeneus multifasciatus</i>	Banded goatfish			LC	Indo-Pacific	no
Goatfish	<i>Parupeneus pleurostigma</i>	Sidespot goatfish			LC	Indian Ocean, Indo-Pacific	no
Goatfish	<i>Parupeneus crassilabris</i>	Thicklippered goatfish			LC	Indo-Pacific	no
Goatfish	<i>Parupeneus indicus</i>	Indian goatfish			LC	Indo-Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Goatfish	<i>Upeneus vanuatu</i>	Vanuatu goatfish			DD	Vanuatu	no
Goatfish	<i>Upeneus vittatus</i>	Yellowstriped goatfish			LC	Indo-Pacific	no
Goby	<i>Akihito vanuatu</i>	Goby			LC	Vanuatu	yes
Goby	<i>Amblyeleotris wheeleri</i>	Gorgeous shrimpgoby			LC	Indo-Pacific	no
Goby	<i>Asterropteryx ensifera</i>	Miller's damsel			LC	Indo-Pacific	no
Goby	<i>Awaous guamensis</i>	Scribbled goby			LC	restricted	yes
Goby	<i>Bryaninops loki</i>	Loki whip-goby			LC	Indo-Pacific	no
Goby	<i>Bryaninops yongei</i>	Seawhip goby			LC	Indo-Pacific	no
Goby	<i>Cabillus tongarevae</i>	Tongareva goby			LC	Indo-Pacific	no
Goby	<i>Cryptocentrus strigilliceps</i>	Target shrimpgoby			LC	Indo-Pacific	no
Goby	<i>Ctenogobiops crocineus</i>	Silverspot shrimpgoby			LC	Indo-Pacific	no
Goby	<i>Ctenogobiops aurocingulus</i>	Gold-streaked shrimpgoby			LC	Indo-Pacific	no
Goby	<i>Ctenogobiops feroculus</i>	Sandy shrimpgoby			LC	Indo-Pacific	no
Goby	<i>Ctenogobiops maculosus</i>	Seychelles shrimpgoby			LC	Indo-west Pacific	no
Goby	<i>Eviota queenslandica</i>	Queensland dwarfgoby			LC	Indo-Pacific	no
Goby	<i>Eviota sigillata</i>	Adorned dwarfgoby			LC	Indo-west Pacific	no
Goby	<i>Eviota smaragdus</i>	Earspot pygmy goby			LC	western Pacific	no
Goby	<i>Eviota sparsa</i>	Speckled pygmy goby			LC	western Pacific	no
Goby	<i>Eviota zonura</i>	Zoned dwarfgoby			LC	western Pacific	no
Goby	<i>Eviota bifasciata</i>	Twostripe dwarfgoby			LC	western Pacific	no
Goby	<i>Eviota cometa</i>	Comet dwarfgoby			LC	western Pacific	no
Goby	<i>Eviota lacrimae</i>	Teared dwarfgoby			LC	western Pacific	no
Goby	<i>Eviota latifasciata</i>	Brown-banded dwarfgoby			LC	western Pacific	no
Goby	<i>Eviota nebulosa</i>	Palespot dwarfgoby			LC	Indo-Pacific	no
Goby	<i>Eviota prasites</i>	Hairfin dwarfgoby			LC	western Pacific	no
Goby	<i>Eviota punctulata</i>	Finspot dwarfgoby			LC	western Pacific	no
Goby	<i>Exyrias belissimus</i>	Mud reef-goby			LC	Indo-west Pacific	no
Goby	<i>Exyrias puntang</i>	Puntang goby			LC	Indo-Pacific	no
Goby	<i>Fusigobius duospilus</i>	Barenaped goby			LC	Indo-west Pacific	no
Goby	<i>Fusigobius neophytus</i>	Sand goby			LC	Indo-Pacific	no
Goby	<i>Fusigobius humeralis</i>	Shoulderspot sandgoby			LC	Indo-Pacific	no
Goby	<i>Gnatholepis ophthalmotaenia</i>	Goby			LC	western Pacific	no
Goby	<i>Gobiopsis exigua</i>	Goby			LC	central Pacific	no
Goby	<i>Gobiopsis quinquecincta</i>	Fiveband barbelgoby			LC	Indo-west Pacific	no
Goby	<i>Istigobius ornatus</i>	Ornate goby			LC	Indo-west Pacific	no
Goby	<i>Istigobius spence</i>	Pearl goby			LC	Indo-Pacific	no
Goby	<i>Koumansetta hectori</i>	Hector's goby			LC	Indo-Pacific	no
Goby	<i>Koumansetta rainfordi</i>	Old glory			LC	Indo-west Pacific	no
Goby	<i>Lentipes kaaea</i>	Goby			LC	western Pacific	yes
Goby	<i>Lotilia klausewitzii</i>	Whitecap shrimpgoby			LC	Indo-Pacific	no
Goby	<i>Macrodonogobius wilburi</i>	Largetooth goby			LC	Indo-Pacific	no
Goby	<i>Mahidolia mystacina</i>	Flagfin Shrimp goby			LC	Indo-Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Goby	<i>Mugilogobius notospilus</i>	Pacific mangrove goby			LC	western Pacific	no
Goby	<i>Palutrus scapulopunctatus</i>	Scapular goby			LC	Indo-Pacific	no
Goby	<i>Paragobiodon echinocephalus</i>	Redhead coral goby			LC	Indo-Pacific	no
Goby	<i>Paragobiodon lacunicolus</i>	Blackfin coral goby			LC	Indo-Pacific	no
Goby	<i>Paragobiodon xanthosomus</i>	Emerald coral goby			LC	Indo-Pacific	no
Goby	<i>Pleurosicya mossambica</i>	Toothy goby			LC	Indo-Pacific	no
Goby	<i>Pleurosicya coerulea</i>	Blue coral ghost goby			LC	Indo-Pacific	no
Goby	<i>Pleurosicya fringilla</i>	Staghorn ghostgoby			LC	Indo-Pacific	no
Goby	<i>Pleurosicya micheli</i>	Michel's ghost goby			LC	Indo-Pacific	no
Goby	<i>Pleurosicya muscarum</i>	Ghost goby			LC	Indo-Pacific	no
Goby	<i>Pleurosicya plicata</i>	Plicata ghost goby			LC	Indo-Pacific	no
Goby	<i>Priolepis semidoliata</i>	Barrel goby			LC	Indo-Pacific	no
Goby	<i>Priolepis compita</i>	Crossroads goby			LC	Indo-west Pacific	no
Goby	<i>Priolepis inhaca</i>	Brick goby			LC	Indo-west Pacific	no
Goby	<i>Psammogobius biocellatus</i>	Sleepy goby			LC	Indo-Pacific	no
Goby	<i>Redigobius bikolanus</i>	Speckled goby			LC	Indo-Pacific	no
Goby	<i>Schismatogobius vanuatuensis</i>	Goby			DD	Vanuatu	yes
Goby	<i>Sicyopterus aiensis</i>	Goby			NT	Vanuatu	yes
Goby	<i>Sicyopterus lagocephalus</i>	Goby			LC	Indo-Pacific	yes
Goby	<i>Sicyopus zosterophorus</i>	Goby			LC	western Pacific	yes
Goby	<i>Smilosicyopus chloe</i>	Goby			LC	New Caledonia, Vanuatu	yes
Goby	<i>Smilosicyopus pentecost</i>	Goby			DD	New Caledonia, Vanuatu	yes
Goby	<i>Stenogobius yateiensis</i>	Goby			LC	New Caledonia, Vanuatu	yes
Goby	<i>Stiphodon astilbos</i>	Goby			DD	Vanuatu	yes
Goby	<i>Stiphodon atratus</i>	Goby			LC	western Pacific	yes
Goby	<i>Stiphodon kalfatak</i>	Goby			DD	Vanuatu	yes
Goby	<i>Stiphodon mele</i>	Goby			DD	New Caledonia, Vanuatu	yes
Goby	<i>Stiphodon rutilaureus</i>	Goby			LC	western Pacific	yes
Goby	<i>Stiphodon sapphirinus</i>	Goby			LC	New Caledonia, Vanuatu	yes
Goby	<i>Stiphodon semoni</i>	Goby			DD	western Pacific	yes
Goby	<i>Sueviota lachneri</i>	Lechner's dwarfgoby			LC	Indo-Pacific	no
Goby	<i>Trimma anaima</i>	Sharp-eye pygmy-goby			LC	Indo-Pacific	no
Goby	<i>Trimma annosum</i>	Grey-bearded pygmy-goby			LC	Indo-west Pacific	no
Goby	<i>Trimma benjamini</i>	Ring-eye pygmy-goby			LC	western Pacific	no
Goby	<i>Trimma capostriatum</i>	Pygmy-goby			LC	western Pacific	no
Goby	<i>Trimma flavatrum</i>	Wasp pygmy-goby			LC	western Pacific	no
Goby	<i>Trimma halonevum</i>	Redspot dwarfgoby			LC	Indo-west Pacific	no
Goby	<i>Trimma hayashii</i>	Four-eye pygmy-goby			LC	western Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Goby	<i>Trimma maiandros</i>	Meander dwarfgoby			LC	Indo-Pacific	no
Goby	<i>Trimma nasa</i>	Nasal dwarfgoby			LC	western Pacific	no
Goby	<i>Trimma okinawae</i>	Okinawa rubble goby			LC	western Pacific	no
Goby	<i>Trimma preclarum</i>	Exquisite pygmy-goby			LC	western Pacific	no
Goby	<i>Trimma stobbsi</i>	Stobbs' dwarfgoby			LC	Indo-Pacific	no
Goby	<i>Trimma taylori</i>	Yellow cave goby			LC	Indo-Pacific	no
Goby	<i>Trimma tevegae</i>	Blue-striped cave goby			LC	Indo-west Pacific	no
Goby	<i>Trimmatom nanus</i>	Midget dwarfgoby			LC	Indo-Pacific	no
Goby	<i>Valenciennea parva</i>	Parva goby			LC	Indo-Pacific	no
Goby	<i>Valenciennea puellaris</i>	Maiden goby			LC	Indo-Pacific	no
Goby	<i>Vanderhorstia ambanoro</i>	Ambanoro shrimpgoby			LC	Indo-west Pacific	no
Goby	<i>Vanderhorstia ornatissima</i>	Ornate shrimpgoby			LC	Indo-Pacific	no
Goby	<i>Vanderhorstia phaeostictus</i>	Yellowfoot shrimpgoby			DD	western Pacific	no
Godwit	<i>Limosa limosa</i>	Black-tailed godwit		II	NT	widespread	yes
Greeneye	<i>Chlorophthalmus agassizi</i>	Agassiz's thread-sail fish			LC	circumglobal, deep	no
Grouper	<i>Aethaloperca rogae</i>	Redmouth grouper			DD	Indo-west Pacific	no
Grouper	<i>Anyperodon leucogrammicus</i>	Slender grouper			LC	Indo-Pacific	no
Grouper	<i>Aporops bilinearis</i>	Blotched podge			LC	Indo-Pacific	no
Grouper	<i>Belonoperca chabanaudi</i>	Arrowhead soapfish			LC	Indo-Pacific	no
Grouper	<i>Cephalopholis argus</i>	Peacock grouper			LC	Indo-Pacific, Pacific	no
Grouper	<i>Cephalopholis aurantia</i>	Golden hind			DD	Indo-Pacific	no
Grouper	<i>Cephalopholis boenak</i>	Chocolate hind			LC	Indo-west Pacific	no
Grouper	<i>Cephalopholis leopardus</i>	Leopard hind			LC	Indo-Pacific	no
Grouper	<i>Cephalopholis microprion</i>	Freckled hind			LC	western Pacific	no
Grouper	<i>Cephalopholis miniata</i>	Coral hind			LC	Indo-Pacific	no
Grouper	<i>Cephalopholis sexmaculata</i>	Sixblotch hind			LC	Indo-Pacific	no
Grouper	<i>Cephalopholis sonnerati</i>	Tomato hind			LC	Indo-Pacific	no
Grouper	<i>Cephalopholis spiloparaea</i>	Strawberry hind			LC	Indo-Pacific	no
Grouper	<i>Cephalopholis urodeta</i>	Darkfin hind			LC	Pacific	no
Grouper	<i>Cromileptes altivelis</i>	Humpback grouper			VU	western Pacific	no
Grouper	<i>Epinephelus hexagonatus</i>	Hexagon grouper			LC	Indo-Pacific	no
Grouper	<i>Epinephelus lanceolatus</i>	Queensland grouper			VU	widespread	no
Grouper	<i>Epinephelus octofasciatus</i>	Eightbar grouper			DD	Indo-west Pacific	no
Grouper	<i>Epinephelus polyphekadion</i>	Camouflage grouper			NT	Indo-Pacific	no
Grouper	<i>Epinephelus amblycephalus</i>	Banded grouper			DD	western Pacific	no
Grouper	<i>Epinephelus areolatus</i>	Areolate grouper			LC	Indo-Pacific	no
Grouper	<i>Epinephelus chlorostigma</i>	Brownspotted grouper			LC	Indo-Pacific	no
Grouper	<i>Epinephelus coeruleopunctatus</i>	White-spotted grouper			LC	Indo-Pacific	no
Grouper	<i>Epinephelus cyanopodus</i>	Speckled blue grouper			LC	western Pacific	no
Grouper	<i>Epinephelus fasciatus</i>	Blacktip grouper			LC	Indo-Pacific	no
Grouper	<i>Epinephelus fuscoguttatus</i>	Brown-marbled grouper			NT	Indo-Pacific	no
Grouper	<i>Epinephelus howlandi</i>	Blacksaddle grouper			LC	Indo-Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Grouper	<i>Epinephelus macrospilos</i>	Snubnose grouper			LC	Indo-Pacific	no
Grouper	<i>Epinephelus maculatus</i>	Highfin grouper			LC	Pacific	no
Grouper	<i>Epinephelus magniscuttis</i>	Speckled grouper			DD	Indo-west Pacific	no
Grouper	<i>Epinephelus melanostigma</i>	One-blotch grouper			DD	Indo-west Pacific	no
Grouper	<i>Epinephelus merra</i>	Honeycomb grouper			LC	Indo-Pacific	no
Grouper	<i>Epinephelus miliaris</i>	Netfin grouper			LC	Indo-west Pacific	no
Grouper	<i>Epinephelus morrhua</i>	Comet grouper			LC	Indo-Pacific	no
Grouper	<i>Epinephelus ongus</i>	White-streaked grouper			LC	Indo-west Pacific	no
Grouper	<i>Epinephelus retouti</i>	Red-tipped grouper			DD	Indo-Pacific	no
Grouper	<i>Epinephelus spilotoceps</i>	Foursaddle grouper			LC	Indo-west Pacific	no
Grouper	<i>Epinephelus tauvina</i>	Greasy grouper			DD	Indo-Pacific	no
Grouper	<i>Gracila albomarginata</i>	Masked grouper			DD	Indo-Pacific	no
Grouper	<i>Grammistes sexlineatus</i>	Sixlined soapfish			LC	Indo-Pacific	no
Grouper	<i>Grammistops ocellatus</i>	Ocellated soapfish			LC	Indo-Pacific	no
Grouper	<i>Lipropoma susumi</i>	Meteor perch			LC	Indo-Pacific	no
Grouper	<i>Plectropomus areolatus</i>	Squaretail coral trout			VU	Indo-Pacific	no
Grouper	<i>Plectropomus laevis</i>	Blacksaddled coral trout			VU	Indo-Pacific	no
Grouper	<i>Plectropomus leopardus</i>	Leopard coral trout			NT	western Pacific	no
Grouper	<i>Pogonoperca punctata</i>	Bearded soapfish			LC	Indo-Pacific	no
Grouper	<i>Pseudogramma polyacantha</i>	Boldspot soapfish			LC	Indian Ocean, Indo-Pacific	no
Grouper	<i>Pseudogramma pectoralis</i>	Pectoral podge			LC	Palau, Philippines, Vanuatu	no
Grouper	<i>Saloptia powelli</i>	Golden grouper			DD	Indo-Pacific	no
Grouper	<i>Suttonia lineata</i>	Freckleface podge			LC	Indo-Pacific	no
Grouper	<i>Variola albimarginata</i>	White-edged lyretail			LC	Indo-Pacific	no
Grouper	<i>Variola louti</i>	Yellow-edged lyretail			LC	Indo-Pacific	no
Grunter	<i>Mesopristes argenteus</i>	Silver grunter			LC	Indo-Pacific	yes
Grunter	<i>Mesopristes cancellatus</i>	Tapiroid grunter			LC	Indo-Pacific	yes
Gulper eel	<i>Eurypharynx pelecyanoides</i>	Pelican gulper eel			LC	circumglobal, deep	no
Halosaur	<i>Aldrovandia affinis</i>	Allied halosaur			LC	widespread, deep	no
Hammerjaw	<i>Omosudis lowii</i>	Hammerjaw			LC	circumglobal, deep	no
Hatchetfish	<i>Argyropelecus aculeatus</i>	Lovely hatchetfish			LC	circumglobal, deep	no
Hatchetfish	<i>Argyropelecus gigas</i>	Giant hatchetfish			LC	circumglobal, deep	no
Hatchetfish	<i>Argyropelecus sladeni</i>	Hatchetfish			LC	circumglobal, deep	no
Hatchetfish	<i>Sternoptyx diaphana</i>	Diaphanous hatchetfish			LC	widespread, deep	no
Hatchetfish	<i>Sternoptyx pseudobscura</i>	Highlight hatchetfish			LC	circumtropical, deep	no
Hatchetfish	<i>Sternoptyx pseudodiaphana</i>	False oblique hatchetfish			LC	circumglobal, deep	no
Hatchetfish	<i>Valenciennellus tripunctulatus</i>	Constellationfish			LC	widespread, deep	no
Hawkfish	<i>Amblycirrhitus bimacula</i>	Twinspot hawkfish			LC	widespread	no
Hawkfish	<i>Amblycirrhitus unimacula</i>	Hawkfish			LC	Indo-Pacific, Pacific	no
Hawkfish	<i>Cirrhitichthys falco</i>	Coral hawkfish			LC	Indo-Pacific	no
Hawkfish	<i>Cirrhitichthys oxycephalus</i>	Coral hawkfish			LC	Indo-Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Hawkfish	<i>Cirrhitus pinnulatus</i>	Stocky hawkfish			LC	Indo-Pacific	no
Hawkfish	<i>Neocirrhites armatus</i>	Flame hawkfish			LC	western Pacific	no
Hawkfish	<i>Oxycirrhites typus</i>	Longnose hawkfish			LC	Indo-Pacific	no
Hawkfish	<i>Paracirrhites arcatus</i>	Arc-eye hawkfish			LC	Indian Ocean, Indo-Pacific	no
Hawkfish	<i>Paracirrhites forsteri</i>	Blackside hawkfish			LC	Indian Ocean, Indo-Pacific	no
Hawkfish	<i>Paracirrhites hemistictus</i>	Whitespot hawkfish			LC	Indo-Pacific	no
Herring	<i>Amblygaster sirm</i>	Herring			LC	Indo-west Pacific	no
Herring	<i>Elops hawaiiensis</i>	Giant herring			DD	Indo-west Pacific	no
Herring	<i>Encrasicholina punctifer</i>	Buccaneer anchovy			LC	Indo-Pacific	no
Herring	<i>Herklotsichthys quadrimaculatus</i>	Bluestripe herring			LC	widespread	no
Herring	<i>Sardinella melanura</i>	Blacklip sardinella			LC	Indo-west Pacific	no
Herring	<i>Spratelloides atrofasciatus</i>	Herring			LC	restricted	no
Herring	<i>Spratelloides delicatulus</i>	Delicate round herring			LC	Indo-Pacific	no
Iguana	<i>Brachylophus fasciatus</i>	Fiji banded iguana	I		EN	4000–10000	no
Jawfish	<i>Opistognathus variabilis</i>	Variable jawfish			LC	Indo-Pacific	no
Lancetfish	<i>Alepisaurus brevirostris</i>	Lancetfish			LC	widespread, deep	no
Lanternbelly	<i>Synagrops japonicus</i>	Blackmouth splitfin			LC	widespread, deep	no
Lanternfish	<i>Benthoosema suborbitale</i>	Lanternfish			LC	widespread, mesopelagic	no
Lanternfish	<i>Bolinichthys distofax</i>	Lanternfish			LC	circumtropical, subtropical, deep	no
Lanternfish	<i>Bolinichthys photothorax</i>	Spurcheek lanternfish			LC	circumtropical, subtropical, deep	no
Lanternfish	<i>Bolinichthys supralateralis</i>	Stubby lanternfish			LC	circumtropical, subtropical, deep	no
Lanternfish	<i>Centrobranchus nigroocellatus</i>	Lanternfish			LC	widespread	no
Lanternfish	<i>Ceratoscopelus warmingii</i>	Lanternfish			LC	widespread	no
Lanternfish	<i>Diaphus anderseni</i>	Andersen's lanternfish			LC	widespread, deep	no
Lanternfish	<i>Diaphus brachycephalus</i>	Lanternfish			LC	widespread, deep	no
Lanternfish	<i>Diaphus effulgens</i>	Lanternfish			LC	widespread, deep	no
Lanternfish	<i>Diaphus fragilis</i>	Lanternfish			LC	widespread, deep	no
Lanternfish	<i>Diaphus lucidus</i>	Lanternfish			LC	widespread, deep	no
Lanternfish	<i>Diaphus lucidus</i>	Lutken's lanternfish			LC	widespread, deep	no
Lanternfish	<i>Diaphus mollis</i>	Soft lanternfish			LC	widespread, deep	no
Lanternfish	<i>Diaphus perspicillatus</i>	Lanternfish			LC	widespread, deep	no
Lanternfish	<i>Diaphus splendidus</i>	Lanternfish			LC	widespread, deep	no
Lanternfish	<i>Diaphus problematicus</i>	Problematic lanternfish			LC	widespread, deep	no
Lanternfish	<i>Diogenichthys atlanticus</i>	Longfin lanternfish			LC	circumtropical	no
Lanternfish	<i>Hygophum reinhardtii</i>	Lanternfish			LC	widespread, deep	no
Lanternfish	<i>Hygophum hygomii</i>	Bermuda lanternfish			LC	widespread, deep	no
Lanternfish	<i>Lampadena luminosa</i>	Lanternfish			LC	circumglobal, deep	no
Lanternfish	<i>Lampanyctus alatus</i>	Lanternfish			LC	widespread, deep	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Lanternfish	<i>Lampanyctus festivus</i>	Lanternfish			LC	widespread, deep	no
Lanternfish	<i>Lampanyctus nobilis</i>	Noble lanternfish			LC	widespread, deep	no
Lanternfish	<i>Lampanyctus pusillus</i>	Pygmy lanternfish			LC	widespread, deep	yes
Lanternfish	<i>Lampanyctus tenuiformis</i>	Lanternfish			LC	widespread, deep	no
Lanternfish	<i>Lobianchia gemellarii</i>	Gemellar's lanternfish			LC	widespread, deep	yes
Lanternfish	<i>Myctophum asperum</i>	Lanternfish			LC	widespread, deep	no
Lanternfish	<i>Myctophum nictidulum</i>	Spotted lanternfish			LC	widespread, deep	no
Lanternfish	<i>Myctophum obtusirostre</i>	Lanternfish			LC	widespread, deep	no
Lanternfish	<i>Myctophum selenops</i>	Lanternfish			LC	widespread, deep	no
Lanternfish	<i>Nannobranchium lineatum</i>	Lanternfish			LC	circumglobal, deep	no
Lanternfish	<i>Notoscopelus resplendens</i>	Patchwork lanternfish			LC	widespread, deep	no
Lanternfish	<i>Norolynchus valdiviae</i>	Topside lanternfish			LC	widespread, deep	no
Lanternfish	<i>Symbolophorus rufinus</i>	Rufous lanternfish			LC	widespread, deep	no
Lanternfish	<i>Taaningichthys bathyphilus</i>	Deepwater lanternfish			LC	widespread, deep	no
Lightfish	<i>Ichthyococcus ovatus</i>	Ovate lightfish			LC	circumglobal, deep	no
Lightfish	<i>Vinciguerria nimbaria</i>	Oceanic lightfish			LC	circumglobal, deep	no
Lionfish	<i>Dicrochirus brachypterus</i>	Dwarf lionfish			LC	Indo-west Pacific	no
Lionfish	<i>Dicrochirus zebra</i>	Zebra lionfish			LC	Indo-west Pacific	no
Lionfish	<i>Pterois antennata</i>	Banded lionfish			LC	Indo-west Pacific	no
Lionfish	<i>Pterois volitans</i>	Common lionfish			LC	Indo-west Pacific	no
Lizardfish	<i>Saurida gracilis</i>	Gracile lizardfish			LC	Indo-Pacific, Pacific	no
Lizardfish	<i>Saurida nebulosa</i>	Cloudy lizardfish			LC	Indo-Pacific	no
Lizardfish	<i>Synodus dermatogenys</i>	Sand lizardfish			LC	Indo-west Pacific	no
Lizardfish	<i>Synodus jaculum</i>	Blackspot lizardfish			LC	Indo-west Pacific	no
Lizardfish	<i>Synodus variegatus</i>	Variegated lizardfish			LC	Indo-west Pacific	no
Lizardfish	<i>Synodus binotatus</i>	Twispot lizardfish			LC	Indo-west Pacific	no
Lizardfish	<i>Synodus rubromarmoratus</i>	Redmarbled lizardfish			LC	western Pacific	no
Lizardfish	<i>Trachinocephalus myops</i>	Snakefish			LC	circumtropical	no
Longfin escolar	<i>Scombrobrax heterolepis</i>	Longfin escolar			LC	widespread, deep	no
Louvar	<i>Luvarus imperialis</i>	Louvar			LC	circumglobal	no
Mackerel	<i>Acanthocybium solandri</i>	Wahoo			LC	cosmopolitan, tropical, warm temperate	yes
Mackerel	<i>Grammatorcynus bilineatus</i>	Double-lined mackerel			LC	Indo-west Pacific	yes
Mackerel	<i>Lepidocybium flavobrunneum</i>	Escolar			LC	widespread	no
Mackerel	<i>Rastrelliger brachysoma</i>	Short mackerel			DD	Pacific	yes
Mackerel	<i>Rastrelliger kanagurta</i>	Indian mackerel			DD	Indo-west Pacific	yes
Mackerel	<i>Scomberomorus commerson</i>	Narrow-barred Spanish mackerel			NT	Indo-west Pacific	yes
Mangrove	<i>Acanthus ebracteatus</i>	Sea holly			LC	South Asia	no
Mangrove	<i>Bruguiera gymnorhiza</i>	Oriental mangrove			LC	widespread	no
Mangrove	<i>Bruguiera parviflora</i>	Mangrove			LC	Indo-Pacific	no
Mangrove	<i>Ceriops tagal</i>	Yellow mangrove			LC	widespread	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Mangrove	<i>Excoecaria agallocha</i>	Euphorbia			LC	Indo-Pacific	no
Mangrove	<i>Lumnitzera littorea</i>	Mangrove			LC	Indo-Pacific	no
Mangrove	<i>Rhizophora stylosa</i>	Red mangrove			LC	Indo-west Pacific	no
Mangrove	<i>Rhizophora apiculata</i>	Mangrove			LC	western Pacific	no
Mangrove	<i>Rhizophora mucronata</i>	Mangrove			LC	western Pacific	no
Mangrove	<i>Sonneratia alba</i>	Mangrove			LC	Indo-Pacific	no
Mangrove	<i>Sonneratia caseolaris</i>	Mangrove			LC	Indo-Pacific	no
Marlin	<i>Kajikia audax</i>	Striped marlin			NT	widespread	yes
Marlin	<i>Makaira indica</i>	Black marlin			DD	Indo-Pacific	yes
Marlin	<i>Makaira nigricans</i>	Blue marlin			LC	circumtropical	yes
Milkfish	<i>Chanos chanos</i>	Milkfish			LC	Indo-Pacific, Pacific	no
Mojarra	<i>Gerres erythrourus</i>	Deep-bodied mojarra			LC	Indo-Pacific	no
Mojarra	<i>Gerres filamentosus</i>	Whipfin mojarra			LC	Indo-Pacific	no
Mojarra	<i>Gerres longirostris</i>	Strongspine siverbidy			LC	Indo-Pacific	no
Mojarra	<i>Gerres oblongus</i>	Slender silverbidy			LC	Indo-Pacific	no
Mojarra	<i>Gerres oyena</i>	Common silverbidy			LC	Indo-Pacific	no
Mola	<i>Masturus lanceolatus</i>	Sharptailed sunfish			LC	circumglobal	no
Mola	<i>Mola mola</i>	Ocean sunfish			VU	circumglobal	no
Moorish idol	<i>Zanclus cornutus</i>	Moorish idol			LC	Indo-west Pacific	no
Moray	<i>Enchelycore schismatorhynchus</i>	Whitemargined moray			LC	Indo-Pacific	no
Mullet	<i>Chelon macrolepis</i>	Largescale mullet			LC	Indo-Pacific	no
Mullet	<i>Crenimugil crenilabis</i>	Fringelip mullet			LC	Indo-Pacific	no
Mullet	<i>Crenimugil heterocheilos</i>	Half fringelip mullet			LC	Indo-Pacific	no
Mullet	<i>Liza tade</i>	Mullet			DD	Indo-Pacific	no
Mullet	<i>Mugil cephalus</i>	Flathead mullet			LC	circumglobal	no
Needlefish	<i>Ablennes hians</i>	Flat needlefish			LC	widespread	no
Needlefish	<i>Tylosurus crocodilus</i>	Hound needlefish			LC	widespread	no
Oarfish	<i>Regalecus glesne</i>	Giant oarfish			LC	circumglobal, deep	no
Octopus	<i>Amphitretus pelagicus</i>	Octopus			LC	widespread, deep	no
Octopus	<i>Argonauta argo</i>	Octopus			LC	widespread	no
Octopus	<i>Argonauta boettigeri</i>	Octopus			LC	Indo-west Pacific	no
Octopus	<i>Argonauta hians</i>	Octopus			LC	widespread	no
Octopus	<i>Bolitaena pygmaea</i>	Octopus			LC	circumtropical, deep	no
Octopus	<i>Haliphron atlanticus</i>	Octopus			LC	circumglobal	no
Octopus	<i>Japetella diaphana</i>	Octopus			LC	widespread, deep	no
Octopus	<i>Tremoctopus gracilis</i>	Palmate octopus			LC	Indian Ocean, Indo-Pacific	no
Octopus	<i>Vitreledonella richardi</i>	Octopus			LC	widespread, deep	no
Parrotfish	<i>Bolbometopon muricatum</i>	Bumphead parrotfish			VU	Indo-Pacific	no
Parrotfish	<i>Calotomus carolinus</i>	Starry-eye parrotfish			LC	widespread	no
Parrotfish	<i>Calotomus spinidens</i>	Spinytooth parrotfish			LC	Indo-Pacific	no
Parrotfish	<i>Cetoscarus ocellatus</i>	Spotted parrotfish			LC	Indo-Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Parrotfish	<i>Chlorurus frontalis</i>	Tanfaced parrotfish			LC	Indo-Pacific, rare	no
Parrotfish	<i>Chlorurus microrhinus</i>	Steephead parrotfish			LC	Indo-Pacific	no
Parrotfish	<i>Chlorurus spilurus</i>	Bullethead parrotfish			LC	Indo-Pacific	no
Parrotfish	<i>Chlorurus bleekeri</i>	Bleeker's parrotfish			LC	Indo-west Pacific	no
Parrotfish	<i>Chlorurus japanensis</i>	Palecheek parrotfish			LC	Indo-west Pacific	no
Parrotfish	<i>Hipposcarus longiceps</i>	Pacific longnose parrotfish			LC	Pacific	no
Parrotfish	<i>Leptoscarus vaigiensis</i>	Marbled parrotfish			LC	Indo-Pacific	no
Parrotfish	<i>Scarus altipinnis</i>	Filament-fin parrotfish			LC	Indo-Pacific	no
Parrotfish	<i>Scarus flavipectoralis</i>	Yellowfin parrotfish			LC	Indo-Pacific	no
Parrotfish	<i>Scarus forsteni</i>	Forsten's parrotfish			LC	Indo-Pacific	no
Parrotfish	<i>Scarus frenatus</i>	Bridled parrotfish			LC	Indo-Pacific	no
Parrotfish	<i>Scarus globiceps</i>	Globehead parrotfish			LC	Indo-Pacific	no
Parrotfish	<i>Scarus niger</i>	Swarthy parrotfish			LC	Indian Ocean, Indo-Pacific	no
Parrotfish	<i>Scarus pyrrhostethus</i>	Blue-banded parrotfish			LC	Indian Ocean, Indo-Pacific	no
Parrotfish	<i>Scarus rivulatus</i>	Surf parrotfish			LC	Indo-Pacific	no
Parrotfish	<i>Scarus rubroviolaceus</i>	Redlip parrotfish			LC	Indian Ocean, Indo-Pacific	no
Parrotfish	<i>Scarus dimidiatus</i>	Yellowbarred parrotfish			LC	western Pacific	no
Parrotfish	<i>Scarus psittacus</i>	Common parrotfish			LC	Indo-Pacific	no
Parrotfish	<i>Scarus quoyi</i>	Quoy's parrotfish			LC	Indo-Pacific	no
Pearleye	<i>Benthalbella infans</i>	Zugmeyer's pearleye			LC	circumglobal, deep	no
Pearleye	<i>Rosenblattichthys hubbsi</i>	Hubb's pearleye			LC	widespread, deep	no
Pearleye	<i>Scopelarchoides danae</i>	Pearleye			LC	circumglobal, deep	no
Pearleye	<i>Scopelarchus analis</i>	Blackbelly pearleye			LC	circumglobal, deep	no
Pearleye	<i>Scopelarchus guentheri</i>	Staring pearleye			LC	circumtropical, subtropical	no
Pearleye	<i>Scopelarchus michaelsarsi</i>	Bigeye pearleyes			LC	circumglobal, deep	no
Pencil smelt	<i>Nansenia pelagica</i>	Pencil smelt			DD	widespread, deep	no
Petrel	<i>Fregatta tropica</i>	Black-bellied storm-petrel			LC	21200000	yes
Petrel	<i>Nesofregatta fuliginosa</i>	Polynesian storm-petrel			EN	32000000	yes
Petrel	<i>Pseudobulweria becki</i>	Beck's petrel			CR	770000	yes
Petrel	<i>Pseudobulweria rostrata</i>	Tahiti petrel			NT	68500000	yes
Petrel	<i>Pterodroma heraldica</i>	Herald petrel			LC	91000000	yes
Petrel	<i>Pterodroma brevipes</i>	Collared petrel			VU	Fiji, Vanuatu	no
Petrel	<i>Pterodroma cervicalis</i>	White-necked petrel			VU	75800000	yes
Pipefish	<i>Bhanotia fasciolata</i>	Corrugated pipefish			LC	Indo-Pacific	no
Pipefish	<i>Choeroichthys cinctus</i>	Barred shortbody pipefish			LC	western Pacific	no
Pipefish	<i>Choeroichthys brachysoma</i>	Short-bodied pipefish			LC	Indo-Pacific	no
Pipefish	<i>Corythoichthys amplexus</i>	Brown-banded pipefish			LC	Indo-Pacific	no
Pipefish	<i>Corythoichthys haematopterus</i>	Blood-spot pipefish			LC	Indo-Pacific	no
Pipefish	<i>Doryrhamphus excisus</i>	Bluestripe pipefish			LC	Indo-Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Pipefish	<i>Doryrhamphus negrosensis</i>	Flagtail pipefish			LC	western Pacific	no
Pipefish	<i>Dunckerocampus dactyliophorus</i>	Banded pipefish			DD	Indo-Pacific	no
Pipefish	<i>Festucalex erythraeus</i>	Red pipefish			LC	Indo-Pacific	no
Pipefish	<i>Halicampus mataafa</i>	Samoan pipefish			LC	Indo-Pacific	no
Pipefish	<i>Micrognathus andersonii</i>	Anderson's pipefish			LC	Indo-Pacific	no
Pipefish	<i>Micrognathus brevisrostris</i>	Pygmy pipefish			LC	Indo-Pacific	no
Pipefish	<i>Microphis brachyurus</i>	Opossum pipefish			LC	Indo-Pacific	yes
Pipefish	<i>Microphis leiaspis</i>	Barhead pipefish			LC	Indo-Pacific	yes
Pipefish	<i>Penetopteryx taeniocephalus</i>	Oceanic pipefish			LC	Indo-Pacific	no
Pipefish	<i>Phoxocampus diacanthus</i>	Obscure pipefish			LC	Indo-Pacific	no
Plover	<i>Arenaria interpres</i>	Ruddy turnstone		II	LC	27600000	yes
Plover	<i>Calidris acuminata</i>	Sharp-tailed sandpiper		II	LC	667000	yes
Plover	<i>Limosa lapponica</i>	Bar-tailed godwit		II	NT	9050000	yes
Plover	<i>Pluvialis fulva</i>	Pacific golden plover		II	LC	>20000	yes
Ponyfish	<i>Aurigequula fasciata</i>	Striped ponyfish			LC	Indo-Pacific	no
Ponyfish	<i>Eubleekeria splendens</i>	Splendid ponyfish			LC	Indo-Pacific	no
Ponyfish	<i>Gazza minuta</i>	Toothed ponyfish			LC	Indo-west Pacific	no
Ponyfish	<i>Leiognathus equulus</i>	Common ponyfish			LC	Indo-Pacific	no
Prion	<i>Pachyptila desolata</i>	Antarctic prion			LC	133000000	yes
Pufferfish	<i>Arothron hispidus</i>	Whitespotted puffer			LC	widespread	no
Pufferfish	<i>Arothron manilensis</i>	Narrowlined puffer			LC	Indo-west Pacific	no
Pufferfish	<i>Arothron meleagris</i>	Guineafowl puffer			LC	widespread	no
Pufferfish	<i>Arothron nigropunctatus</i>	Black-spotted puffer			LC	Indo-Pacific	no
Pufferfish	<i>Arothron stellatus</i>	Star puffer			LC	widespread	no
Pufferfish	<i>Arothron immaculatus</i>	Immaculate puffer			LC	Indo-west Pacific	no
Pufferfish	<i>Arothron mappa</i>	Map puffer			LC	Indo-Pacific	no
Pufferfish	<i>Canthigaster amboinensis</i>	Canthigaster amboinensis			LC	widespread	no
Pufferfish	<i>Canthigaster axiologus</i>	Pufferfish			LC	Indo-Pacific	no
Pufferfish	<i>Canthigaster bennetti</i>	Bennet's pufferfish			LC	widespread	no
Pufferfish	<i>Canthigaster valentini</i>	Blacksaddled toby			LC	widespread	no
Pufferfish	<i>Canthigaster compressa</i>	Compressed toby			LC	western Pacific	no
Pufferfish	<i>Canthigaster ocellicineta</i>	Shy toby			LC	Indo-west Pacific	no
Pufferfish	<i>Canthigaster solandri</i>	Spotted sharpnose			LC	Indo-Pacific, Pacific	no
Pufferfish	<i>Chilomycterus reticulatus</i>	Fewspined porcupinefish			LC	circumtropical	no
Pufferfish	<i>Diodon eydouxii</i>	Pelagic porcupinefish			LC	circumglobal	no
Pufferfish	<i>Diodon holocanthus</i>	Balloon porcupinefish			LC	circumglobal	no
Pufferfish	<i>Diodon hystrix</i>	Spotfish porcupinefish			LC	circumtropical	no
Pufferfish	<i>Lagocephalus lagocephalus</i>	Oceanic puffer			LC	widespread	no
Pufferfish	<i>Lagocephalus sceleratus</i>	Sivercheeked toadfish			LC	widespread	no
Pufferfish	<i>Sphoeroides pachygaster</i>	Blunthead pufferfish			LC	circumglobal	no
Pufferfish	<i>Takifugu oblongus</i>	Oblong blow fish			LC	Indian Ocean, Indo-Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Rabbitfish	<i>Siganus argenteus</i>	Forktail rabbitfish			LC	Indo-west Pacific	no
Rabbitfish	<i>Siganus doliatus</i>	Barred rabbitfish			LC	western Pacific	no
Rabbitfish	<i>Siganus puellus</i>	Masked rabbitfish			LC	Indo-west Pacific	no
Rabbitfish	<i>Siganus punctatus</i>	Gold-spotted rabbitfish			LC	Indo-west Pacific	no
Rabbitfish	<i>Siganus spinus</i>	Mottled rabbitfish			LC	western Pacific	no
Rabbitfish	<i>Siganus lineatus</i>	Lined rabbitfish			LC	Indo-west Pacific	no
Rabbitfish	<i>Siganus vermiculatus</i>	Vermiculated spinefoot			LC	Indo-Pacific	no
Raptor	<i>Circus approximans</i>	Swamp harrier	II	II	LC	17500000	yes
Raptor	<i>Haliastur indus</i>	Brahminy kite			LC	45300000	no
Ray	<i>Manta alfredi</i>	Reef mata ray	II		VU	circumtropical ad subtropical, reef	yes
Ray	<i>Neotrygon kuhlii</i>	Bluespotted stingray			LC	widespread	no
Ray	<i>Taeniura lymma</i>	Bluestpotted fantail ray			NT	Indo-west Pacific	no
Ray	<i>Urogymnus asperrimus</i>	Porcupine ray			VU	Indo-west Pacific	no
Razorfish	<i>Aeoliscus strigatus</i>	Coral shrimpfish			DD	Indo-west Pacific	no
Remora	<i>Echeneis naucrates</i>	Remora			LC	circumtropical	no
Remora	<i>Phtheichthys lineatus</i>	Slender suckerfish			LC	circumglobal	no
Remora	<i>Remora australis</i>	Whale remora			LC	circumtropical, subtropical	no
Remora	<i>Remora osteochir</i>	Marlin suckerfish			LC	circumtropical, subtropical	no
Remora	<i>Remora remora</i>	Common remora			LC	circumtropical, subtropical	no
Ribbonfish	<i>Desmodema polystictum</i>	Polkadot ribbonfish			LC	circumglobal, deep, rare	no
Ribbonfish	<i>Zu cristatus</i>	Scalloped ribbonfish			LC	circumglobal, deep	no
Ridgehead	<i>Melamphaes longivelis</i>	Ridgehead			DD	widespread, deep	no
Ridgehead	<i>Melamphaes polylepis</i>	Ridgehead			DD	circumtropical, deep	no
Ridgehead	<i>Melamphaes simus</i>	Ridgehead			LC	circumglobal, deep	no
Ridgehead	<i>Poromitra crassiceps</i>	Crested bigscale			LC	widespread, deep	no
Ridgehead	<i>Poromitra megalops</i>	Ridgehead			DD	widespread, deep	no
Ridgehead	<i>Scopeloberyx robustus</i>	Longjaw bigscale			DD	circumtropical, subtropical, deep	no
Ridgehead	<i>Scopelogadus mizolepis</i>	Ragged bigscale			LC	widespread, deep	no
Sabretooth fish	<i>Odontostomops normalops</i>	Sabretooth fish			LC	widespread, deep	no
Sailfish	<i>Istiophorus platypterus</i>	Sailfish			LC	widespread	yes
Sand-darter	<i>Gobitrichinotus radiocularis</i>	Sandfish			LC	western Pacific	no
Sand-darter	<i>Kraemeria samoensis</i>	Samoan sand dart			LC	Indo-Pacific	no
Sand-diver	<i>Trichonotus elegans</i>	Long-rayed sand-diver			LC	Indo-Pacific	no
Sand-diver	<i>Trichonotus setiger</i>	Spotted sand-diver			LC	Indo-Pacific	no
Sandburrer	<i>Limnichthys fasciatus</i>	Barred sandburrer			LC	south Pacific	no
Sandburrer	<i>Limnichthys nitidus</i>	Donaldson's sandburrer			LC	Indo-Pacific	no
Scat	<i>Scatophagus argus</i>	Spotted scat			LC	Indian Ocean, Indo-Pacific	no
Scorpionfish	<i>Caracanthus maculatus</i>	Spotted coral croucher			LC	Indo-west Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Scorpionfish	<i>Caracanthus unipinna</i>	Pygmy coral croucher			LC	Indo-west Pacific	no
Scorpionfish	<i>Dendrochirus biocellatus</i>	Twospot turkeyfish			LC	Indo-west Pacific	no
Scorpionfish	<i>Ectreposebastes imus</i>	Mid-water scorpionfish			LC	circumglobal, deep	no
Scorpionfish	<i>Parascorpaena moultoni</i>	Coral perch			LC	Indo-Pacific	no
Scorpionfish	<i>Pontinus rhodochrous</i>	Scorpionfish			LC	Indo-west Pacific	no
Scorpionfish	<i>Pteroidichthys noronhai</i>	Scorpionfish			LC	Indo-west Pacific	no
Scorpionfish	<i>Pterois radiata</i>	Radial firefish			LC	Indo-west Pacific	no
Scorpionfish	<i>Rhinopias aphanes</i>	Weedy scorpionfish			LC	western Pacific	no
Scorpionfish	<i>Scorpaenodes corallinus</i>	Coral scorpionfish			LC	Indo-Pacific	no
Scorpionfish	<i>Scorpaenodes minor</i>	Minor scorpionfish			LC	Indo-west Pacific	no
Scorpionfish	<i>Scorpaenodes varipinnis</i>	Blotchfin scorpionfish			LC	Indo-west Pacific	no
Scorpionfish	<i>Scorpaenoides albaiensis</i>	Splitfin scorpionfish			LC	Indo-west Pacific	no
Scorpionfish	<i>Scorpaenoides guamensis</i>	Guam scorpionfish			LC	Indo-west Pacific	no
Scorpionfish	<i>Scorpaenoides parvipinnis</i>	Shortfinned scorpionfish			LC	Indo-west Pacific	no
Scorpionfish	<i>Scorpaenopsis diabolus</i>	False stonefish			LC	Indo-west Pacific	no
Scorpionfish	<i>Scorpaenopsis eschmeyeri</i>	Scorpionfish			LC	south-west Pacific	no
Scorpionfish	<i>Scorpaenopsis macrochir</i>	Flasher scorpionfish			LC	Indo-west Pacific	no
Scorpionfish	<i>Scorpaenopsis papuensis</i>	Papuan scorpionfish			LC	Indo-west Pacific	no
Scorpionfish	<i>Scorpaenopsis possi</i>	Poss's scorpionfish			LC	Indo-west Pacific	no
Scorpionfish	<i>Scorpaenopsis vittapinna</i>	Bandfin scorpionfish			LC	Indo-west Pacific	no
Scorpionfish	<i>Sebastapistes mauritiana</i>	Spineblotch scorpionfish			LC	Indo-west Pacific	no
Scorpionfish	<i>Sebastapistes cyanostigma</i>	Yellowspotted scorpionfish			LC	Indo-Pacific	no
Scorpionfish	<i>Sebastapistes strongia</i>	Barchin scorpionfish			LC	Indo-Pacific	no
Scorpionfish	<i>Setarches guentheri</i>	Deepwater scorpionfish			LC	circumglobal, deep	no
Scorpionfish	<i>Taenianotus triacanthus</i>	Leaf scorpionfish			LC	Indo-Pacific	no
Sea cucumber	<i>Actinopyga echinites</i>	Deepwater redfish			VU	western and central Pacific	no
Sea cucumber	<i>Actinopyga lecanora</i>	Stonefish			DD	western Pacific	no
Sea cucumber	<i>Actinopyga mauritiana</i>	Surf redfish			VU	Indo-Pacific	no
Sea cucumber	<i>Actinopyga miliaris</i>	Hairy blackfish			VU	Indo-Pacific	no
Sea cucumber	<i>Bohadschia similis</i>	Chalkfish			DD	western and central Pacific	no
Sea cucumber	<i>Bohadschia argus</i>	Leopardfish			LC	Indo-Pacific	no
Sea cucumber	<i>Bohadschia marmorata</i>	Brown sandfish			DD	Indo-west Pacific	no
Sea cucumber	<i>Bohadschia tenuissima</i>	Sea cucumber			DD	Indo-west Pacific	no
Sea cucumber	<i>Holothuria fuscogilva</i>	White teatfish			VU	Indian Ocean, Indo-Pacific	no
Sea cucumber	<i>Holothuria arenicola</i>	Sea cucumber			DD	widespread	no
Sea cucumber	<i>Holothuria atra</i>	Lollyfish			LC	widespread	no
Sea cucumber	<i>Holothuria cinerascens</i>	Ashy sea cucumber			LC	Indo-Pacific	no
Sea cucumber	<i>Holothuria coluber</i>	Snakefish			LC	Pacific	no
Sea cucumber	<i>Holothuria discrepans</i>	Sea cucumber			DD	Indo-West Pacific	no
Sea cucumber	<i>Holothuria edulis</i>	Pinkfish			LC	Indo-Pacific	no
Sea cucumber	<i>Holothuria erinaceus</i>	Sea cucumber			LC	Indo-Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Sea cucumber	<i>Holothuria flavomaculata</i>	Sea cucumber			LC	Indo-Pacific	no
Sea cucumber	<i>Holothuria fuscocinerea</i>	Sea cucumber			LC	Indo-Pacific	no
Sea cucumber	<i>Holothuria hilla</i>	Sea cucumber			LC	Indo-West Pacific	no
Sea cucumber	<i>Holothuria impatiens</i>	Bottleneck sea cucumber			DD	circumtropical	no
Sea cucumber	<i>Holothuria inhabilis</i>	Sea cucumber			LC	Indo-Pacific	no
Sea cucumber	<i>Holothuria lessoni</i>	Golden sandfish			EN	western central Pacific	no
Sea cucumber	<i>Holothuria leucospilota</i>	White thread fish			LC	Indo-Pacific	no
Sea cucumber	<i>Holothuria olivacea</i>	Sea cucumber			DD	Indo-west Pacific	no
Sea cucumber	<i>Holothuria pardalis</i>	Sea cucumber			LC	Indo-Pacific	no
Sea cucumber	<i>Holothuria pervicax</i>	Sea cucumber			LC	Indo-Pacific	no
Sea cucumber	<i>Holothuria rigida</i>	Sea cucumber			LC	Indo-Pacific	no
Sea cucumber	<i>Holothuria scabra</i>	Golden sandfish			EN	Indo-Pacific	no
Sea cucumber	<i>Holothuria verrucosa</i>	Sea cucumber			LC	Indo-Pacific	no
Sea cucumber	<i>Holothuria whitmaei</i>	Black teatfish			EN	Pacific	no
Sea cucumber	<i>Labidodemas rugosum</i>	Sea cucumber			LC	Indo-west Pacific	no
Sea cucumber	<i>Labidodemas semperianum</i>	Sea cucumber			LC	Indo-Pacific	no
Sea cucumber	<i>Pearsonothuria graeffei</i>	Blackspotted sea cucumber			LC	Indo-Pacific	no
Sea cucumber	<i>Stichopus chloronotus</i>	Greenfish			LC	Indo-Pacific	no
Sea cucumber	<i>Stichopus herrmanni</i>	Curryfish			VU	Indo-Pacific	no
Sea cucumber	<i>Stichopus horrens</i>	Selenka's sea cucumber			DD	Indo-Pacific	no
Sea cucumber	<i>Stichopus monotuberculatus</i>	Sea cucumber			DD	Indo-Pacific	no
Sea cucumber	<i>Stichopus naso</i>	Sea cucumber			LC	Indo-Pacific	no
Sea cucumber	<i>Thelenota ananas</i>	Prickly redfish			EN	Indo-Pacific	no
Sea cucumber	<i>Thelenota anax</i>	Amberfish			DD	Indo-west Pacific	no
Sea cucumber	<i>Thelenota rubralineata</i>	Sea cucumber			DD	western Pacific	no
Sea snake	<i>Acrochordus granulatus</i>	Little filesnake			LC	widespread	no
Sea snake	<i>Hydrophis coggeri</i>	Slender-necked sea snake			LC	Coral Triangle	no
Sea snake	<i>Laticauda colubrina</i>	Columbrine sea krait			LC	Indo-west Pacific	no
Sea snake	<i>Laticauda frontalis</i>	Yellow-lipped sea snake			NT	Vanuatu	no
Sea snake	<i>Laticauda laticaudata</i>	Brown-lipped sea snake			LC	Indo-Pacific	no
Sea snake	<i>Pelamis platura</i>	Yellow-bellied sea snake			LC	Indian Ocean, Indo-Pacific	no
Sea turtle	<i>Chelonia mydas</i>	Green turtle	I	I/II	EN	circumglobal	yes
Sea turtle	<i>Dermochelys coriacea</i>	Leatherback turtle	I	I/II	VU	circumglobal	yes
Sea turtle	<i>Eretmochelys imbricata</i>	Hawksbill turtle	I	I/II	CR	circumtropical and subtropical	yes
Seagrass	<i>Cymodocea rotundata</i>	Seagrass			LC	Indo-Pacific	no
Seagrass	<i>Cymodocea serrulata</i>	Seagrass			LC	Indo-Pacific	no
Seagrass	<i>Enhalus acoroides</i>	Seagrass			LC	Indo-Pacific	no
Seagrass	<i>Halodule pinifolia</i>	Seagrass			LC	Indo-Pacific	no
Seagrass	<i>Halophila ovalis</i>	Seagrass			LC	Indo-Pacific	no
Seagrass	<i>Halophila decipiens</i>	Seagrass			LC	circumtropical	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Seagrass	<i>Halophila minor</i>	Seagrass			LC	Indo-Pacific	no
Seagrass	<i>Syringodium isoetifolium</i>	Seagrass			LC	Indo-Pacific	no
Seagrass	<i>Thalassia hemprichii</i>	Turtle grass			LC	Indo-Pacific	no
Seagrass	<i>Thalassodendron ciliatum</i>	Seagrass			LC	Indo-Pacific	no
Seahorse	<i>Hippocampus histrix</i>	Spiny seahorse	II		VU	Uncertain	no
Seahorse	<i>Hippocampus kuda</i>	Spotted seahorse	II		VU	Uncertain	no
Seahorse	<i>Hippocampus denise</i>	Denise's pygmy seahorse			DD	western Pacific	no
Shark	<i>Carcharhinus longimanus</i>	Oceanic whitetip shark	II		VU	circumglobal	no
Shark	<i>Etmopterus splendidus</i>	Spendid lanternshark			DD	restricted, deep	no
Shark	<i>Galeocerdo cuvier</i>	Tiger shark			NT	Indo-Pacific	no
Shark	<i>Galeus priapus</i>	Phallic catshark			LC	New Caledonia, Vanuatu	no
Shark	<i>Iago garricki</i>	Longnose hound shark			LC	Australia, Philippines, Vanuatu	no
Shark	<i>Isurus oxyrinchus</i>	Shortfin mako		II	VU	circumglobal, temperate, tropical	yes
Shark	<i>Negaprion acutidens</i>	Sharptooth lemon shark			VU	Indo-Pacific	no
Shark	<i>Prionace glauca</i>	Blue shark			NT	widespread	no
Shark	<i>Rhincodon typus</i>	Whale shark	II	II	VU	cosmopolitan, tropical, warm temperate	yes
Shark	<i>Sphyrna lewini</i>	Scalloped hammerhead	II		EN	circumglobal, warm, coastal	yes
Shark	<i>Squalus melanurus</i>	Blacktailed spurdog			LC	New Caledonia, Vanuatu	no
Shark	<i>Squalus rancureli</i>	Cyrano spurdog			NT	Vanuatu	no
Shark	<i>Triaenodon obesus</i>	Whitetip reef shark			NT	Indo-Pacific	no
Shearwater	<i>Ardenna carneipes</i>	Flesh-footed shearwater			NT	188000000	yes
Shearwater	<i>Ardenna pacifica</i>	Wedge-tailed shearwater			LC	160000000	yes
Shearwater	<i>Puffinus bailloni</i>	Tropical shearwater			LC	94600000	yes
Skua	<i>Stercorarius parasiticus</i>	Arctic Jaeger			LC	148000000	yes
Skua	<i>Stercorarius pomarinus</i>	Pomarine Jaeger			LC	95200000	yes
Sleeper	<i>Belobranchus belobranchus</i>	Throatpine gudgeon			DD	Coral Triangle	yes
Sleeper	<i>Bostrychus sinensis</i>	Four-eyed sleeper			LC	Indo-west Pacific	no
Sleeper	<i>Bunaka gyrinoides</i>	Greenbacked guavina			LC	Coral Triangle	no
Sleeper	<i>Butis amboinensis</i>	Ambon gudgeon			LC	Coral Triangle	no
Sleeper	<i>Butis butis</i>	Duckbill sleeper			LC	Indo-Pacific	no
Sleeper	<i>Calumia profunda</i>	Deepreef coralgudgeon			LC	western Pacific	no
Sleeper	<i>Eleotris acanthopoma</i>	Spinecheek gudgeon			LC	western Pacific	no
Sleeper	<i>Eleotris fusca</i>	Dusky sleeper			LC	Indo-Pacific	no
Sleeper	<i>Eleotris melanosoma</i>	Broadhead sleeper			LC	Indo-Pacific	no
Sleeper	<i>Giuris margaritacea</i>	Snakehead gudgeon			LC	Indo-Pacific	no
Sleeper	<i>Ophiocara porocephala</i>	Spangled gudgeon			LC	Indo-Pacific	yes
Slickhead	<i>Talismania antillarum</i>	Antillean slickhead			LC	circumglobal, deep	no
Snake mackerel	<i>Diplospinus multistriatus</i>	Striped escolar			LC	circumtropical	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Snake mackerel	<i>Nealotus tripes</i>	Black snake mackerel			LC	widespread	no
Snake mackerel	<i>Promethichthys prometheus</i>	Promethean escolar			LC	circumtropical	no
Snaketooth	<i>Dysalotus alcocki</i>	Snaketooth			LC	widespread, deep	no
Snaketooth	<i>Dysalotus oligoscolus</i>	Snaketooth			LC	circumglobal, deep	no
Snaketooth	<i>Kali kerberti</i>	Snaketooth			LC	widespread, deep	no
Snaketooth	<i>Kali indica</i>	Snaketooth			LC	widespread, deep	no
Snaketooth	<i>Kali macrura</i>	Snaketooth			LC	widespread, deep	no
Snaketooth	<i>Pseudoscopelus altipinnis</i>	Snaketooth			LC	circumglobal, deep	no
Snaketooth	<i>Pseudoscopelus scriptus</i>	Snaketooth			LC	widespread, deep	no
Snapper	<i>Aphareus furca</i>	Small-toothed jobfish			LC	widespread	no
Snapper	<i>Aphareus rutilans</i>	Rusty jobfish			LC	widespread	no
Snapper	<i>Aprion virescens</i>	Green jobfish			LC	widespread	no
Snapper	<i>Etelis carbunculus</i>	Deepwater red snapper			LC	widespread, deep	no
Snapper	<i>Etelis coruscans</i>	Deepwater longtail red snapper			LC	Indo-Pacific	no
Snapper	<i>Etelis radiosus</i>	Pale snapper			LC	Indo-Pacific, deep	no
Snapper	<i>Lipocheilus carnolabrum</i>	Tang's snapper			LC	Indo-west Pacific	no
Snapper	<i>Lutjanus argentimaculatus</i>	Mangrove jack			LC	Indo-Pacific	yes
Snapper	<i>Lutjanus bohar</i>	Red bass			LC	Indo-west Pacific	no
Snapper	<i>Lutjanus fulviflamma</i>	Blackspot snapper			LC	Indo-Pacific	no
Snapper	<i>Lutjanus fulvus</i>	Blacktail snapper			LC	Indo-Pacific	no
Snapper	<i>Lutjanus kasmira</i>	Bluebanded snapper			LC	Indo-Pacific	no
Snapper	<i>Lutjanus monostigma</i>	Onespot snapper			LC	Indo-Pacific	no
Snapper	<i>Lutjanus quinquelineatus</i>	Five-lined snapper			LC	Indo-Pacific	no
Snapper	<i>Lutjanus rufolineatus</i>	Golden-lined snapper			LC	western Pacific	no
Snapper	<i>Lutjanus russellii</i>	Russell's snapper			LC	western Pacific	no
Snapper	<i>Lutjanus bouton</i>	Moluccan snapper			LC	Indo-west Pacific	no
Snapper	<i>Lutjanus gibbus</i>	Humpback red snapper			LC	Indo-west Pacific	no
Snapper	<i>Lutjanus johnii</i>	John's snapper			LC	Indo-west Pacific	yes
Snapper	<i>Lutjanus lunulatus</i>	Lunartail snapper			LC	western Pacific	no
Snapper	<i>Lutjanus lutjanus</i>	Bigeye snapper			LC	Indo-west Pacific	no
Snapper	<i>Lutjanus rivulatus</i>	Blubberlip snapper			LC	Indo-Pacific	no
Snapper	<i>Lutjanus semicinctus</i>	Black-banded snapper			LC	western Pacific	no
Snapper	<i>Lutjanus timoriensis</i>	Timor snapper			LC	Indo-Pacific	no
Snapper	<i>Lutjanus vitta</i>	Brownstripe red snapper			LC	Indo-Pacific	no
Snapper	<i>Macolor niger</i>	Black and white snapper			LC	Indo-Pacific	no
Snapper	<i>Macolor macularis</i>	Midnight snapper			LC	Indo-Pacific	no
Snapper	<i>Paracaesio sordida</i>	Blue snapper			LC	Indo-Pacific	no
Snapper	<i>Paracaesio xanthura</i>	Yellowtail blue snapper			LC	Indo-Pacific	no
Snapper	<i>Paracaesio kusakarii</i>	Saddleback snapper			LC	western Pacific	no
Snapper	<i>Paracaesio stonei</i>	Stone's fusilier			LC	western Pacific	no
Snapper	<i>Pinjalo lewisi</i>	Red pinjalo			LC	Indo-west Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Snapper	<i>Pristipomoides argyrogrammicus</i>	Ornate jobfish			LC	Indo-Pacific	no
Snapper	<i>Pristipomoides auricilla</i>	Goldflag jobfish			LC	Indo-Pacific	no
Snapper	<i>Pristipomoides filamentosus</i>	Crimson jobfish			LC	Indo-Pacific	no
Snapper	<i>Pristipomoides multidentis</i>	Goldbanded jobfish			LC	Indo-Pacific	no
Snapper	<i>Pristipomoides sieboldii</i>	Lavender jobfish			LC	Indo-Pacific	no
Snapper	<i>Pristipomoides zonatus</i>	Oblique-banded jobfish			LC	Indo-Pacific	no
Snapper	<i>Pristipomoides flavipinnis</i>	Golden eye jobfish			LC	Pacific	no
Snapper	<i>Symphorus nematophorus</i>	Chinamanfish			LC	western Pacific	no
Soldierfish	<i>Myripristis berndti</i>	Bigscale soldierfish			LC	widespread	no
Soldierfish	<i>Myripristis hexagona</i>	Blacktip soldierfish			LC	Indo-Pacific, Pacific	no
Soldierfish	<i>Myripristis kuntee</i>	Shoulderbar soldierfish			LC	Indo-Pacific	no
Soldierfish	<i>Myripristis murdjan</i>	Pinecone soldierfish			LC	Indo-Pacific, Pacific	no
Soldierfish	<i>Myripristis adusta</i>	Shadowfin soldierfish			LC	Indo-west Pacific	no
Soldierfish	<i>Myripristis pralinia</i>	Big eye soldierfish			LC	Indo-Pacific	no
Soldierfish	<i>Myripristis violacea</i>	Lattice soldierfish			LC	Indo-Pacific	no
Soldierfish	<i>Myripristis vittata</i>	Whitetip soldierfish			LC	Indo-west Pacific	no
Soldierfish	<i>Plectrypops lima</i>	Shy soldierfish			LC	Indian Ocean, Indo-Pacific	no
Soldierfish	<i>Sargocentron cornutum</i>	Threespot squirrelfish			LC	Indo-Pacific	no
Soldierfish	<i>Sargocentron iota</i>	Dwarf squirrelfish			LC	Indo-Pacific	no
Soldierfish	<i>Sargocentron melanospilos</i>	Blackblotch squirrelfish			LC	Indo-Pacific	no
Soldierfish	<i>Sargocentron microstoma</i>	Smallmouth squirrelfish			LC	Indo-Pacific	no
Soldierfish	<i>Sargocentron praslin</i>	Brownspot squirrelfish			LC	Indo-Pacific	no
Soldierfish	<i>Sargocentron tiereoides</i>	Pink squirrelfish			LC	Indo-Pacific	no
Soldierfish	<i>Sargocentron violaceum</i>	Violet squirrelfish			LC	Indo-Pacific	no
Sole	<i>Dexillus muelleri</i>	Tufted sole			LC	Central Indo-Pacific	no
Sole	<i>Pardachirus pavoninus</i>	Peacock sole			LC	Indo-Pacific	no
Sole	<i>Soleichthys heterorhinus</i>	Banded sole			LC	Indo-west Pacific	no
Spinyfin	<i>Diretmus argenteus</i>	Siver spinyfin			LC	circumglobal, deep, uncommon	no
Sprat	<i>Spratelloides gracilis</i>	Silver sprat			LC	widespread	no
Squid	<i>Ancistrocheirus lesueuri</i>	Sharpear enope squid			LC	widespread	no
Squid	<i>Ommastrephes bartramii</i>	Squid			LC	circumglobal, temperate, subtropical	yes
Squid	<i>Onychoteuthis meridiopacifica</i>	Squid			DD	restricted, deep	no
Squid	<i>Sepia latimanus</i>	Broadclub cuttlefish			DD	widespread	no
Squid	<i>Sthenoteuthis oualaniensis</i>	Squid			LC	circumtropical	no
Squid	<i>Thysanoteuthis rhombus</i>	Diamondback squid			LC	circumtropical, subtropical	no
Squirrelfish	<i>Neoniphon argenteus</i>	Clearfin squirrelfish			LC	Indo-Pacific	no
Squirrelfish	<i>Neoniphon opercularis</i>	Blackfin squirrelfish			LC	Indo-west Pacific	no
Squirrelfish	<i>Neoniphon sammara</i>	Spotfin squirrelfish			LC	Indo-Pacific	no
Squirrelfish	<i>Ostichthys kaianus</i>	Deepwater squirrelfish			LC	widespread, deep	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Squirrelfish	<i>Sargocentron caudimaculatum</i>	Tailspot squirrelfish			LC	Indo-Pacific	no
Squirrelfish	<i>Sargocentron diadema</i>	Crowned squirrelfish			LC	Indian Ocean, Indo-Pacific	no
Squirrelfish	<i>Sargocentron lepros</i>	Spiny squirrelfish			LC	Indo-Pacific	no
Squirrelfish	<i>Sargocentron punctatissimum</i>	White-spotted squirrelfish			LC	Indo-Pacific	no
Squirrelfish	<i>Sargocentron rubrum</i>	Redcoat squirrelfish			LC	Indian Ocean, Indo-Pacific	no
Squirrelfish	<i>Sargocentron spiniferum</i>	Spinecheek squirrelfish			LC	Indo-west Pacific	no
Squirrelfish	<i>Sargocentron tiere</i>	Blue-lined squirrelfish			LC	Indo-west Pacific	no
Sunfish	<i>Ranzania laevis</i>	Dwarf sunfish			LC	circumtropical	no
Surgeonfish	<i>Acanthurus albipectoralis</i>	Whitefin surgeonfish			LC	Indo-Pacific	no
Surgeonfish	<i>Acanthurus blochii</i>	Ringtail surgeonfish			LC	Indian Ocean, Indo-Pacific, Pacific	no
Surgeonfish	<i>Acanthurus dussumieri</i>	Eyestripe surgeonfish			LC	widespread	no
Surgeonfish	<i>Acanthurus guttatus</i>	Whitespotted surgeonfish			LC	widespread	no
Surgeonfish	<i>Acanthurus lineatus</i>	Striped surgeonfish			LC	Indo-west Pacific, Pacific	no
Surgeonfish	<i>Acanthurus mata</i>	Elongate surgeonfish			LC	widespread	no
Surgeonfish	<i>Acanthurus nigrofuscus</i>	Brown surgeonfish			LC	widespread	no
Surgeonfish	<i>Acanthurus olivaceus</i>	Orange band surgeonfish			LC	widespread	no
Surgeonfish	<i>Acanthurus pyroferus</i>	Mimic surgeonfish			LC	widespread	no
Surgeonfish	<i>Acanthurus thompsoni</i>	Thompson's surgeonfish			LC	widespread	no
Surgeonfish	<i>Acanthurus triostegus</i>	Convict tang			LC	widespread	no
Surgeonfish	<i>Acanthurus nigricans</i>	Blackear surgeonfish			LC	Pacific	no
Surgeonfish	<i>Acanthurus nigricauda</i>	Black-barred surgeonfish			LC	Indo-Pacific	no
Surgeonfish	<i>Acanthurus xanthopterus</i>	Yellow-mask surgeonfish			LC	Indo-Pacific	no
Surgeonfish	<i>Ctenochaetus binotatus</i>	Twospot bristletooth			LC	Indo-Pacific	no
Surgeonfish	<i>Ctenochaetus striatus</i>	Striped bristletooth			LC	widespread	no
Surgeonfish	<i>Ctenochaetus cyanocheilus</i>	Short-tail bristle-tooth			LC	western Pacific	no
Surgeonfish	<i>Ctenochaetus tominiensis</i>	Orangetipped bristletooth			LC	western Pacific	no
Surgeonfish	<i>Naso annulatus</i>	Whitemargin unicornfish			LC	Indo-Pacific	no
Surgeonfish	<i>Naso brevirostris</i>	Palefin unicornfish			LC	widespread	no
Surgeonfish	<i>Naso caesius</i>	Gray unicornfish			LC	western Pacific	no
Surgeonfish	<i>Naso hexacanthus</i>	Sleek unicornfish			LC	Indo-Pacific	no
Surgeonfish	<i>Naso lituratus</i>	Orangespine unicornfish			LC	Indo-Pacific	no
Surgeonfish	<i>Naso unicornis</i>	Bluespine unicornfish			LC	Indo-Pacific	no
Surgeonfish	<i>Naso brachycentron</i>	Humpback unicornfish			LC	Indo-Pacific	no
Surgeonfish	<i>Naso lopezi</i>	Slender unicornfish			LC	Indo-Pacific	no
Surgeonfish	<i>Naso tonganus</i>	Bulbnose unicornfish			LC	Indo-Pacific	no
Surgeonfish	<i>Paracanthurus hepatus</i>	Blue tang			LC	Indian Ocean, Indo-Pacific	no
Surgeonfish	<i>Zebрасoma scopas</i>	Brushtail tang			LC	Indian Ocean, Indo-Pacific	no
Surgeonfish	<i>Zebрасoma veliferum</i>	Sailfin tang			LC	Indo-west Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Sweetlips	<i>Plectorhinchus gibbosus</i>	Brown sweetlips			LC	Indo-Pacific	no
Sweetlips	<i>Pomadasys argenteus</i>	Silver javelin			LC	Indo-west Pacific	no
Tapertail	<i>Radiicephalus elongatus</i>	Tapertail			LC	circumglobal, deep	no
Tarpon	<i>Megalops cyprinoides</i>	Indo-Pacific tarpon			DD	Indo-west Pacific	yes
Tattler	<i>Tringa brevipes</i>	Grey-tailed tattler		II	NT	7560000	yes
Tattler	<i>Tringa incana</i>	Wandering tattler		II	LC	2450000	yes
Telescopefish	<i>Gigantura elegans</i>	Indian telescopefish			LC	widespread	no
Telescopefish	<i>Gigantura chuni</i>	Gigantura			LC	widespread, deep	no
Tern	<i>Anous minutus</i>	Black noddy			LC	164000000	no
Tern	<i>Anous stolidus</i>	Brown noddy			LC	215000000	no
Tern	<i>Gygis alba</i>	Common white tern			LC	137000000	no
Tern	<i>Onychoprion fuscatus</i>	Sooty tern			LC	195000000	yes
Tern	<i>Onychoprion lunatus</i>	Grey-backed tern			LC	29100000	no
Tern	<i>Sterna sumatrana</i>	Black-naped tern			LC	61800000	yes
Tern	<i>Sterna dougallii</i>	Roseate tern			LC	120000000	yes
Tern	<i>Sterna hirundo</i>	Common tern		II	LC	112000000	yes
Tern	<i>Thalasseus bergii</i>	Lesser crested tern			LC	142000000	yes
Tinselfish	<i>Xenolepidichthys dalgleishi</i>	Spotted tinselfish			LC	circumglobal, deep	no
Toothed seadevil	<i>Neoceratias spinifer</i>	Toothed seadevil			LC	circumglobal, deep	no
Trevally	<i>Alectis ciliaris</i>	African Pompano			LC	circumtropical	no
Trevally	<i>Carangoides coeruleopinnatus</i>	Bluefin kingfish			LC	widespread	no
Trevally	<i>Carangoides ferdau</i>	Banded trevally			LC	widespread	no
Trevally	<i>Carangoides fulvoguttatus</i>	Yellow-spotted trevally			LC	widespread	no
Trevally	<i>Carangoides orthogrammus</i>	Island jack			LC	Indo-Pacific	no
Trevally	<i>Carangoides gymnostethus</i>	Bludger			LC	Indo-west Pacific	no
Trevally	<i>Carangoides hedlandensis</i>	Bumnose trevally			LC	Indo-Pacific	no
Trevally	<i>Carangoides oblongus</i>	Coachwhip trevally			LC	Indo-Pacific	no
Trevally	<i>Carangoides plagiotaenia</i>	Barcheek trevally			LC	Indo-west Pacific	no
Trevally	<i>Caranx ignobilis</i>	Giant trevally			LC	widespread	no
Trevally	<i>Caranx lugubris</i>	Black trevally			LC	circumtropical	no
Trevally	<i>Caranx melampygus</i>	Bluefin trevally			LC	Indo-Pacific	no
Trevally	<i>Caranx sexfasciatus</i>	Bigeye trevally			LC	Indo-west Pacific	no
Trevally	<i>Caranx heberi</i>	Blacktip trevally			LC	Indo-west Pacific	no
Trevally	<i>Caranx papuensis</i>	Brassy trevally			LC	Indo-west Pacific	no
Trevally	<i>Decapterus macarellus</i>	Mackerel scad			LC	circumtropical	no
Trevally	<i>Decapterus macrosoma</i>	Shortfin scad			LC	Indo-Pacific	no
Trevally	<i>Decapterus tabl</i>	Roughear scad			LC	circumtropical	no
Trevally	<i>Elegatis bipinnulata</i>	Rainbow runner			LC	circumtropical	no
Trevally	<i>Gnathanodon speciosus</i>	Golden trevally			LC	Indo-west Pacific	no
Trevally	<i>Megalaspis cordyla</i>	Torpedo scad			LC	Indo-west Pacific	no
Trevally	<i>Naucrates ductor</i>	Pilotfish			LC	circumtropical	no

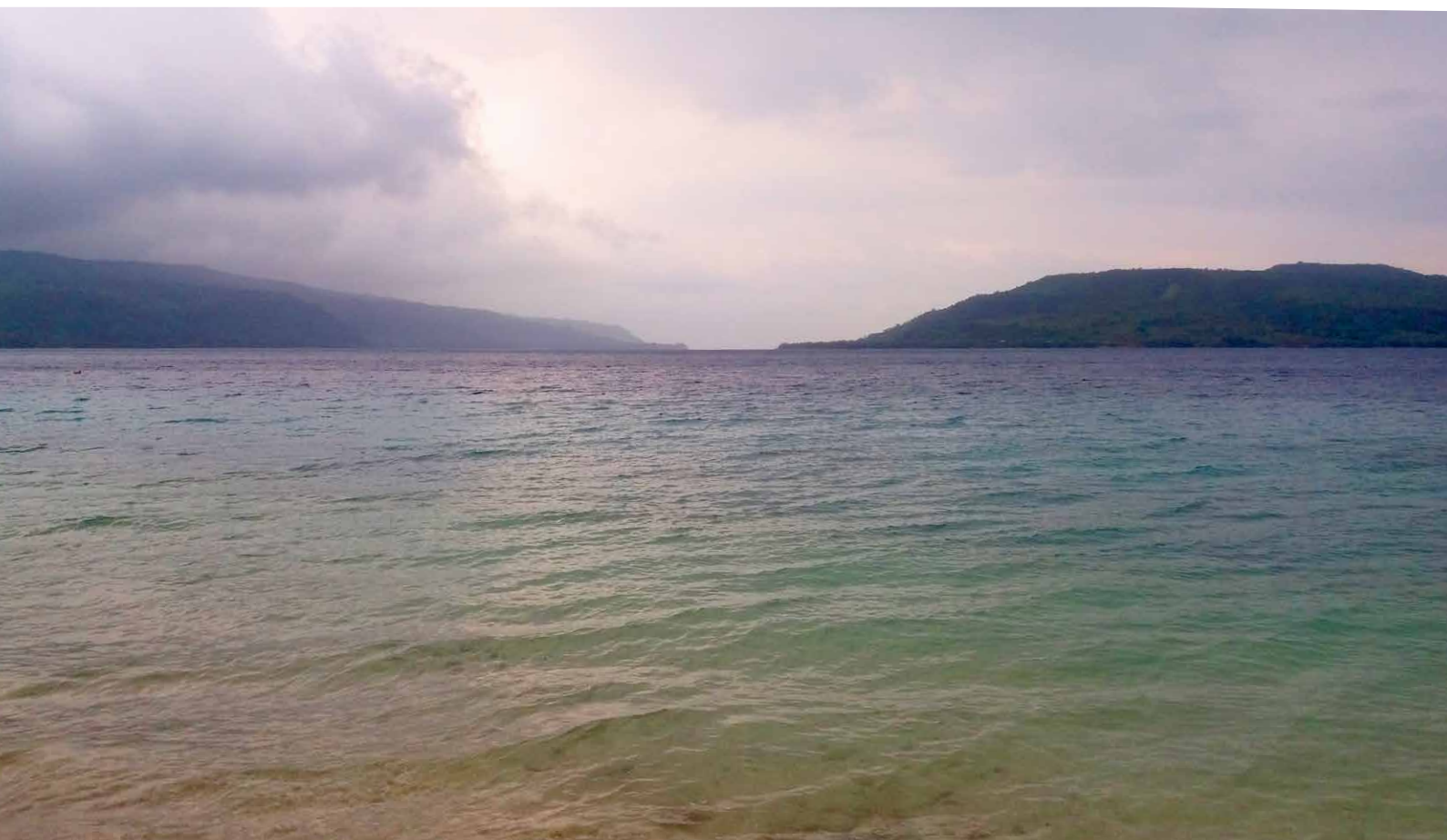
Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Trevally	<i>Scomberoides lysan</i>	Doublespotted queenfish			LC	Indo-Pacific	no
Trevally	<i>Selar crumenophthalmus</i>	Bigeye scad			LC	circumglobal	no
Trevally	<i>Selar boops</i>	Oxeye scad			LC	Indo-west Pacific	no
Trevally	<i>Seriola dumerilii</i>	Greater amberjack			LC	circumglobal	no
Trevally	<i>Seriola rivoliana</i>	Longfin yellowtail			LC	circumtropical	no
Trevally	<i>Trachinotus bailloni</i>	Small spotted dart			LC	Indo-west Pacific	no
Trevally	<i>Trachinotus blochii</i>	Snubnose pompano			LC	Indian Ocean, Indo-Pacific	no
Triggerfish	<i>Canthidermis maculata</i>	Rough triggerfish			LC	circumglobal	no
Triplefin	<i>Ceratobregma helenae</i>	Helena's triplefin			LC	Pacific	no
Triplefin	<i>Enneapterygius triserialis</i>	Whitespotted triplefin			LC	restricted	no
Triplefin	<i>Enneapterygius elegans</i>	Hourglass triplefin			LC	Indo-Pacific	no
Triplefin	<i>Enneapterygius flavoccipitis</i>	Yellownape triplefin			LC	Central Indo-Pacific	no
Triplefin	<i>Enneapterygius fuscoventer</i>	Blackbelly triplefin			LC	Central Indo-Pacific	no
Triplefin	<i>Enneapterygius hemimelas</i>	Halfblack triplefin			LC	Pacific	no
Triplefin	<i>Enneapterygius minutus</i>	Minute triplefin			LC	Indo-west Pacific	no
Triplefin	<i>Enneapterygius mirabilis</i>	Miracle triplefin			LC	Coral Triangle	no
Triplefin	<i>Enneapterygius niger</i>	Black triplefin			LC	New Caledonia, Solomon Islands, Vanuatu	no
Triplefin	<i>Enneapterygius nigricauda</i>	Blacktail triplefin			LC	western Pacific	no
Triplefin	<i>Enneapterygius pallidoserialis</i>	Pale white-spotted triplefin			LC	western Pacific	no
Triplefin	<i>Enneapterygius philippinus</i>	Minute triplefin			LC	Indo-Pacific	no
Triplefin	<i>Enneapterygius pyramis</i>	Pyramid triplefin			LC	western Pacific	no
Triplefin	<i>Enneapterygius rhabdotus</i>	Umpire triplefin			LC	western central Pacific	no
Triplefin	<i>Enneapterygius rhothion</i>	Surf triplefin			LC	New Caledonia, Vanuatu	no
Triplefin	<i>Enneapterygius rubicauda</i>	Redtail triplefin			LC	western Pacific	no
Triplefin	<i>Enneapterygius signicauda</i>	Flagtail triplefin			LC	western Pacific	no
Triplefin	<i>Enneapterygius tutuilae</i>	High hat triplefin			LC	Indo-Pacific	no
Triplefin	<i>Enneapterygius williamsi</i>	William's triplefin			LC	western central Pacific	no
Triplefin	<i>Helcogramma chica</i>	Little hooded triplefin			LC	Indo-west Pacific	no
Triplefin	<i>Helcogramma fuscipectoris</i>	Fourspot triplefin			LC	western Pacific	no
Triplefin	<i>Helcogramma hudsoni</i>	Hudson's triplefin			LC	western Pacific	no
Triplefin	<i>Helcogramma nigra</i>	Triplefin			LC	western central Pacific	no
Triplefin	<i>Helcogramma rhinoceros</i>	Rhinoceros triplefin			LC	Indo-Pacific	no
Triplefin	<i>Helcogramma striata</i>	Tropical striped triplefin			LC	Indo-Pacific	no
Triplefin	<i>Helcogramma trigloides</i>	Triplefin			LC	western Pacific	no
Triplefin	<i>Norfolkia thomasi</i>	Thomas' triplefin			LC	restricted	no
Triplefin	<i>Norfolkia brachylepis</i>	Tropical scaly-headed triplefin			LC	Indo-west Pacific	no
Triplefin	<i>Springerichthys kulbickii</i>	Kulbicki's triplefin			LC	western central Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Triplefin	<i>Ucla xenogrammus</i>	Largemouth triplefin			LC	Indo-Pacific	no
Tropicbird	<i>Phaethon lepturus</i>	White-tailed tropicbird			LC	161000000	yes
Tuna	<i>Euthynnus affinis</i>	Mackerel tuna			LC	Indo-west Pacific	yes
Tuna	<i>Gymnosarda unicolor</i>	Dogtooth tuna			LC	Indo-Pacific	yes
Tuna	<i>Thunnus alalunga</i>	Albacore			NT	circumglobal	yes
Tuna	<i>Thunnus albacares</i>	Yellowfin tuna			NT	worldwide	yes
Tuna	<i>Thunnus obesus</i>	Bigeye tuna			VU	circumtropical	yes
Viperfish	<i>Chauliodus sloani</i>	Sloan's viperfish			LC	circumglobal, deep	no
Wader	<i>Actitis hypoleucos</i>	Common sandpiper			LC	47200000	yes
Wader	<i>Calidris ruficollis</i>	Red-necked stint			NT	3360000	yes
Wader	<i>Charadrius leschenaultii</i>	Greater sandplover		II	LC	9850000	yes
Wader	<i>Esacus magnirostris</i>	Beach thick-knee			NT	29800000	no
Wader	<i>Numenius phaeopus</i>	Whimbrel		II	LC	31100000	yes
Waryfish	<i>Ahliesaurus berryi</i>	Waryfish			LC	widespread, deep	no
Whale	<i>Balaenoptera edeni</i>	Bryde's whale	I	II	DD	circumglobal, warm	uncertain
Whale	<i>Feresa attenuata</i>	Pygmy killer whale	II		DD	circumtropical	no
Whale	<i>Kogia breviceps</i>	Pygmy sperm whale	II		DD	widespread	no
Whale	<i>Kogia sima</i>	Dwarf sperm whale	II		DD	circumtropical and subtropical	unknown
Whale	<i>Megaptera novaeangliae</i>	Humpback whale	I	I	LC	cosmopolitan	yes
Whale	<i>Mesoplodon densirostris</i>	Blainville's beaked whale	II		DD	circumtropical	no
Whale	<i>Mesoplodon ginkgodens</i>	Ginkgo-toothed beaked whale	II		DD	widespread, rare	no
Whale	<i>Orcinus orca</i>	Killer whale	II	II	DD	circumglobal	no
Whale	<i>Physeter macrocephalus</i>	Sperm whale	I	I/II	VU	circumglobal	no
Whale	<i>Pseudorca crassidens</i>	False killer whale	II		DD	circumtropical	no
Whale	<i>Ziphius cavirostris</i>	Cuvier's beaked whale	II	I	LC	circumglobal	no
Whalefish	<i>Barbourisia rufa</i>	Redvelvet whalefish			LC	circumglobal, deep, rare	no
Whalefish	<i>Cetostoma regani</i>	Pink flabby whalefish			DD	circumglobal, deep	no
Whalefish	<i>Ditropichthys storeri</i>	Doublekeeled whalefish			DD	circumglobal, deep	no
Whalefish	<i>Rondeletia loricata</i>	Redmouth whalefish			LC	circumglobal, deep	no
Wormfish	<i>Gunnellichthys curiosus</i>	Curious wormfish			LC	Indo-Pacific	no
Wormfish	<i>Gunnellichthys monostigma</i>	Onespot wormfish			LC	Indo-Pacific	no
Wormfish	<i>Gunnellichthys pleurotaenia</i>	Onestripe wormfish			LC	Indo-Pacific	no
Wormfish	<i>Gunnellichthys viridescens</i>	Yellowstripe wormfish			LC	Indo-west Pacific	no
Wormfish	<i>Nemateleotris decora</i>	Elegant firefish			LC	Indo-Pacific	no
Wormfish	<i>Parioglossus formosus</i>	Beautiful hover goby			LC	Indo-Pacific	no
Wormfish	<i>Parioglossus nudus</i>	Naked hover goby			LC	western Pacific	no
Wormfish	<i>Parioglossus taeniatus</i>	Striped dartfish			LC	Indo-west Pacific	no
Wrasse	<i>Anampses caeruleopunctatus</i>	Bluespotted wrasse			LC	Indian Ocean, Indo-Pacific	no
Wrasse	<i>Anampses neoguinaicus</i>	Black-banded wrasse			LC	Indo-west Pacific	no
Wrasse	<i>Anampses twistii</i>	Yellowbreasted wrasse			LC	widespread	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Wrasse	<i>Anampses meleagrides</i>	Marble wrasse			LC	Indo-west Pacific	no
Wrasse	<i>Bodianus anthioides</i>	Lyre-tail hogfish			LC	Indo-Pacific	no
Wrasse	<i>Bodianus axillaris</i>	Turncoat hogfish			LC	Indo-Pacific	no
Wrasse	<i>Bodianus dictynna</i>	Hogfish			LC	Indo-west Pacific	no
Wrasse	<i>Bodianus loxozonus</i>	Blackfin hogfish			LC	Indo-Pacific	no
Wrasse	<i>Bodianus mesothorax</i>	Yellowspotted hogfish			LC	Indo-Pacific	no
Wrasse	<i>Cheilinus chlorurus</i>	Floral wrasse			LC	Indo-Pacific	no
Wrasse	<i>Cheilinus undulatus</i>	Humphead wrasse	II		EN	widespread	no
Wrasse	<i>Cheilinus fasciatus</i>	Redbreasted wrasse			LC	Indo-west Pacific	no
Wrasse	<i>Cheilinus oxycephalus</i>	Snooty wrasse			LC	Indo-Pacific	no
Wrasse	<i>Cheilio inermis</i>	Cigar wrasse			LC	widespread	no
Wrasse	<i>Choerodon anchorago</i>	Orange-dotted tuskfish			LC	Indo-west Pacific	no
Wrasse	<i>Choerodon jordani</i>	Jordan's tuskfish			LC	western Pacific	no
Wrasse	<i>Choerodon schoenleinii</i>	Blackspot tuskfish			NT	Indo-Pacific	no
Wrasse	<i>Cirrhilabrus punctatus</i>	Dotted wrasse			LC	restricted	no
Wrasse	<i>Cirrhilabrus scottorum</i>	Scott's wrasse			LC	Indo-Pacific	no
Wrasse	<i>Cirrhilabrus exquisitus</i>	Exquisite wrasse			DD	Indo-Pacific	no
Wrasse	<i>Cirrhilabrus laboutei</i>	Magenta-streaked wrasse			LC	Australia, New Caledonia, Vanuatu	no
Wrasse	<i>Cirrhilabrus pylei</i>	Pyle's wrasse			LC	Coral Triangle	no
Wrasse	<i>Cirrhilabrus rubrimarginatus</i>	Red-margined wrasse			LC	Indo-Pacific	no
Wrasse	<i>Coris aygula</i>	Humphead wrasse			LC	Indo-Pacific	no
Wrasse	<i>Coris batuensis</i>	Schroeder's wrasse			LC	Indo-Pacific	no
Wrasse	<i>Coris dorsomacula</i>	Spotfin wrasse			LC	Indo-Pacific	no
Wrasse	<i>Coris gaimard</i>	Clown wrasse			LC	Indo-Pacific, Pacific	no
Wrasse	<i>Cymolutes praetextatus</i>	Knife razorfish			LC	Indo-Pacific	no
Wrasse	<i>Diproctacanthus xanthurus</i>	Yellowtail tubelip			LC	western Pacific	no
Wrasse	<i>Epibulus insidiator</i>	Slingjaw wrasse			LC	Indo-Pacific	no
Wrasse	<i>Gomphosus varius</i>	Bird wrasse			LC	Indo-Pacific	no
Wrasse	<i>Halichoeres biocellatus</i>	Biocellate wrasse			LC	Indo-west Pacific	no
Wrasse	<i>Halichoeres hartzfeldii</i>	Orange-lined wrasse			LC	western Pacific	no
Wrasse	<i>Halichoeres hortulanus</i>	Checkerboard wrasse			LC	Indo-Pacific	no
Wrasse	<i>Halichoeres margaritaceus</i>	Pearlspot wrasse			LC	Indo-Pacific	no
Wrasse	<i>Halichoeres marginatus</i>	Dusky wrasse			LC	Indo-Pacific	no
Wrasse	<i>Halichoeres prosopeion</i>	Twotone wrasse			LC	Indo-west Pacific	no
Wrasse	<i>Halichoeres trimaculatus</i>	Three-spot wrasse			LC	Indo-Pacific	no
Wrasse	<i>Halichoeres argus</i>	Peacock wrasse			LC	Indo-Pacific	no
Wrasse	<i>Halichoeres chloropterus</i>	Pastel-green wrasse			LC	western Pacific	no
Wrasse	<i>Halichoeres claudia</i>	Claudia's wrasse			LC	Indo-Pacific	no
Wrasse	<i>Halichoeres melanurus</i>	Tail-spot wrasse			LC	western Pacific	no
Wrasse	<i>Halichoeres melasmapomus</i>	Ocellated wrasse			LC	Indo-Pacific	no
Wrasse	<i>Halichoeres miniatus</i>	Circle-cheek wrasse			LC	western Pacific	no
Wrasse	<i>Halichoeres richmondi</i>	Richmond's wrasse			LC	western Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Wrasse	<i>Halichoeres scapularis</i>	Brownbanded wrasse			LC	Indo-west Pacific	no
Wrasse	<i>Hemigymnus fasciatus</i>	Banded thicklip wrasse			LC	Indo-Pacific	no
Wrasse	<i>Hemigymnus melapterus</i>	Blackedge thicklip wrasse			LC	Indo-Pacific	no
Wrasse	<i>Hologymnosus annulatus</i>	Ringed wrasse			LC	Indo-Pacific	no
Wrasse	<i>Hologymnosus doliatus</i>	Narrow-banded wrasse			LC	Indo-Pacific	no
Wrasse	<i>Hologymnosus longipes</i>	Sidespot longface wrasse			LC	restricted	no
Wrasse	<i>Iniistius aneitensis</i>	Pale razorfish			LC	Indo-Pacific	no
Wrasse	<i>Iniistius pavo</i>	Peacock razorfish			LC	Indo-Pacific	no
Wrasse	<i>Labrichthys unilineatus</i>	Tubelip wrasse			LC	Indo-Pacific	no
Wrasse	<i>Labropsis australis</i>	Southern tubelip			LC	restricted	no
Wrasse	<i>Labroides bicolor</i>	Bicolor cleanerfish			LC	widespread	no
Wrasse	<i>Labroides dimidiatus</i>	Cleaner wrasse			LC	Indo-Pacific	no
Wrasse	<i>Labroides pectoralis</i>	Blackspot cleaner wrasse			LC	Indo-west Pacific	no
Wrasse	<i>Labropsis xanthonota</i>	Wedgetailed wrasse			LC	Indo-Pacific	no
Wrasse	<i>Macropharyngodon kuiteri</i>	Black leopard wrasse			LC	restricted	no
Wrasse	<i>Macropharyngodon meleagris</i>	Blackspotted wrasse			LC	Indo-Pacific	no
Wrasse	<i>Macropharyngodon negrosensis</i>	Yellowspotted wrasse			LC	Indo-Pacific	no
Wrasse	<i>Novaculichthys taeniorus</i>	Rockmover wrasse			LC	widespread	no
Wrasse	<i>Oxycheilinus bimaculatus</i>	Comettailed wrasse			LC	Indo-Pacific	no
Wrasse	<i>Oxycheilinus digramma</i>	Cheeklined wrasse			LC	Indian Ocean, Indo-Pacific	no
Wrasse	<i>Oxycheilinus unifasciatus</i>	Ringtail maori wrasse			LC	Indo-Pacific	no
Wrasse	<i>Oxycheilinus orientalis</i>	Oriental maori wrasse			LC	Indo-Pacific	no
Wrasse	<i>Paracheilinus rubricaudalis</i>	Redtail flasherwrasse			LC	restricted	no
Wrasse	<i>Pseudocheilinus hexataenia</i>	Sixlined wrasse			LC	Indo-west Pacific	no
Wrasse	<i>Pseudocheilinus octotaenia</i>	Eight-lined wrasse			LC	Indian Ocean, Indo-Pacific	no
Wrasse	<i>Pseudocheilinus evanidus</i>	Disappearing wrasse			LC	Indo-west Pacific	no
Wrasse	<i>Pseudocheilinus ocellatus</i>	White-barred pink wrasse			LC	western south Pacific	no
Wrasse	<i>Pseudocoris yamashiroi</i>	Redspot wrasse			LC	Indian Ocean, Indo-Pacific	no
Wrasse	<i>Pseudocoris heteroptera</i>	Torpedo wrasse			LC	Indo-Pacific	no
Wrasse	<i>Pseudodax moluccanus</i>	Chisel-tooth wrasse			LC	Indo-Pacific	no
Wrasse	<i>Pseudojuloides cerasinus</i>	Candy wrasse			DD	Pacific	no
Wrasse	<i>Pseudojuloides mesostigma</i>	Blackpatch wrasse			LC	restricted	no
Wrasse	<i>Pteragogus cryptus</i>	Cryptic wrasse			LC	Indian Ocean, Indo-Pacific	no
Wrasse	<i>Pteragogus enneacanthus</i>	Red-striped wrasse			LC	Indo-west Pacific	no
Wrasse	<i>Pteragogus flagellifer</i>	Flagfin wrasse			LC	Indo-Pacific	no
Wrasse	<i>Stethojulis bandanensis</i>	Red-spot wrasse			LC	Indo-Pacific	no
Wrasse	<i>Stethojulis notialis</i>	Wrasse			LC	Southwest and central Pacific	no
Wrasse	<i>Stethojulis strigiventer</i>	Silverstreaked wrasse			LC	Indo-Pacific	no
Wrasse	<i>Stethojulis trilineata</i>	Three-lined wrasse			LC	Indo-west Pacific	no

Category	Scientific Name	Common Name	CITES	CMS	IUCN Red List Assessment	Range (km ²)	Migrant
Wrasse	<i>Thalassoma amblycephalum</i>	Blunthead wrasse			LC	Indian Ocean, Indo-Pacific	no
Wrasse	<i>Thalassoma hardwicke</i>	Sixbar wrasse			LC	Indo-Pacific	no
Wrasse	<i>Thalassoma lunare</i>	Moon wrasse			LC	Indo-Pacific	no
Wrasse	<i>Thalassoma lutescens</i>	Sunset wrasse			LC	Indo-Pacific	no
Wrasse	<i>Thalassoma purpurum</i>	Purple wrasse			LC	Indo-Pacific	no
Wrasse	<i>Thalassoma quinquevittatum</i>	Fivestripe wrasse			LC	Indo-Pacific	no
Wrasse	<i>Thalassoma trilobatum</i>	Christmas wrasse			LC	Indo-west Pacific	no
Wrasse	<i>Wetmorella nigropinnata</i>	Blackspot pygmy wrasse			LC	Indian Ocean, Indo-Pacific	no
Wrasse	<i>Xyrichtys halsteadii</i>	Halstead's razorfish			LC	western Pacific	no
Ray	<i>Taeniurops meyeri</i>	Blotched fantail ray			VU	Indo-west Pacific	no





Marine and Coastal Biodiversity Management
in Pacific Island Countries



www.macbio-pacific.info