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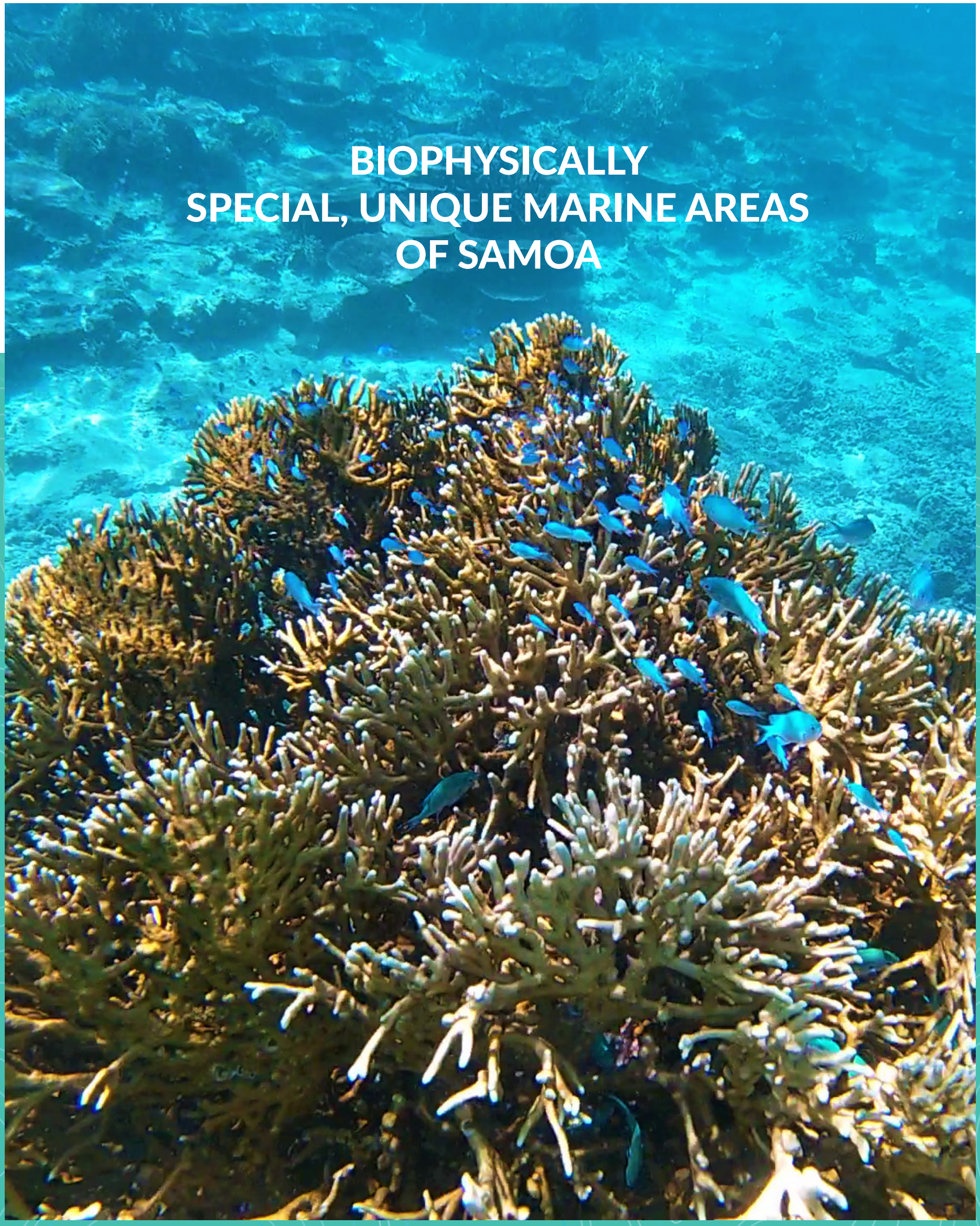
BIOPHYSICALLY SPECIAL, UNIQUE MARINE AREAS OF SAMOA



BIOPHYSICALLY SPECIAL, UNIQUE MARINE AREAS OF SAMOA

FINAL REPORT

17 September 2020

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1. Acknowledgements

The authors would like to thank the Government of Samoa and specifically, the Marine Spatial Planning Project Team. We would further like to acknowledge the marine experts of Samoa who kindly donated their time during and after the workshop to identify special, unique marine areas of Samoa, listed in Appendix 1.

The Special Unique Marine Areas workshop is a key activity of the Marine Spatial Planning Project which is being led by the Samoan Government's Ministry of Natural Resources and Environment (MNRE), the Samoa Umbrella for Non-Governmental Organisations (SUNGO) and the International Union for Conservation of Nature (IUCN).

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2. Acronyms

CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	Convention on the Conservation of Migratory Species of Wild Animals
DSL	Deep scattering layer
EBSA	Ecologically or Biologically Significant Marine Areas
EEZ	Exclusive Economic Zone
IBA	Important Bird Areas
IMMA	Important Marine Mammal Area
IUCN	International Union for the Conservation of Nature
KBA	Key Biodiversity Area
LMMA	Locally Managed Marine Area
MAF	Ministry of Agriculture and Fisheries
MESCAL	Mangrove Ecosystems for Climate Change Adaptation and Livelihoods
MNRE	Ministry of Natural Resources and Environment
MPA	Marine Protected Area
MSP	Marine Spatial Planning
MWCSD	Ministry of Women, Community and Social Development
NAPA	National Adaptation Programme of Action
NBSAP	National Biodiversity Strategy and Action Plan
SPC	Secretariat of the Pacific Community
SPREP	Secretariat of the Pacific Regional Environment Programme
SUMA	Special and / or unique marine area
UNESCO	United Nations Educational, Scientific and Cultural Organization
WCPFC	Western and Central Pacific Fisheries Commission

3. Executive summary

A national-scale Marine Spatial Plan (MSP) is one of the four key strategies in the recently launched Samoa Oceans Strategy (SOS) 2020-2030. The SOS aims to use the MSP process to support ecosystem-based adaptation, while strengthening community engagement in actions that enhance resilience to the impacts of climate change. As part of the MSP process, the Samoan Government has identified Samoa's special and/or unique marine areas (SUMAs). This report synthesises data, literature and the outputs of a dedicated workshop identifying the selected areas.

The SUMAs were described, justified and scored according to four criteria: geographic explicitness, justification, information sources and legal obligations associated with each area. Each area (or site) was described in as much detail as the available information sources allowed, and was given a score out of 12. Offshore and inshore sites were scored separately to account for the different nature of these ecosystems and the varying amounts of information available about them. Through the workshop and following extensive background research and review, Samoa's experts and stakeholders identified six offshore and 26 inshore SUMAs. Among the inshore SUMAs, 15 were on Upolu Island and 11 on Savai'i Island.

Samoa's offshore SUMAs received scores between 7 and 10.5, reflecting the general lack of information available for Samoa's offshore marine environments. The highest-scoring offshore site (Seamounts, ridges, guyots & escarpments) was described in greater detail in the available literature than most of the other sites; it was also morphologically highly complex. The lowest scoring site (Whale Migration Route) had a general lack of evidence to support its justification. Clear site boundaries and robust background information are important for spatial planning, and this was reflected in the scores received by each SUMA.

Among the inshore sites, the four highest-scoring sites were Vaiusu Bay mangroves (10), Northwest Savai'i (10), Palolo Deep (11) and Five Mile Reef (12). These sites were geographically clearly defined, held distinctly special attributes and included availability of high-quality relevant information. Most of the high-scoring sites included a range of different habitats in close proximity that had already been selected for protection due to their recognised ecological value. Low-scoring sites (4-5) were those 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 due to their remoteness or difficult accessibility which resulted in their ecosystems remaining relatively intact. For example, coral reefs further offshore may have received a higher score because lack of exploitation and pollution increases biodiversity and resilience, generating more abundant flora and fauna and intact food webs. Spatial planning can take this into account directly and in the context of connectivity, whereby intact coral reefs could act as sources of larvae to replenish degraded reefs.

Both high and low scores were useful for management; high-scoring sites could be prioritised for protection with greater confidence, while lower-scoring sites could be targeted for research. 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, while also informing other management measures or environmental impact assessments potentially relevant to these locations.

4. INTRODUCTION

In Samoa, the ocean and its resources provide the basis for people's livelihoods and food security, and contribute significantly to Samoa's economy (MNRE, 2015). As the biodiversity and productivity of Samoa's marine ecosystems underpins the resources that people rely on, protecting these ecosystems is paramount to ensuring their persistence in an uncertain future. This has become especially apparent during the global COVID19 pandemic of 2020. The Samoan Government's Samoa Oceans Strategy (SOS) 2020-2030 aims to support ecosystem-based adaptation by implementing a national-scale Marine Spatial Plan (MSP), while strengthening community engagement in actions that enhance resilience to the impacts of climate change.

Marine Spatial Planning, or MSP (also referred to in Samoa as Ocean Planning), is a practical way of balancing the demands of human activities with the need to maintain the health of the ecosystems on which those activities depend. This is especially important in Pacific Island countries, where ~98% of the area under each nation's jurisdiction is ocean. Marine ecosystems are known to be in decline globally, mostly due to human activities, but there is recognition that it is possible to manage human activities to minimise these impacts. The Ocean Plan involves an organised and transparent inter-sectoral and participatory public process of identifying and achieving economic, social and ecological objectives. The intended result of the Ocean Plan is to spatially organise human activities to ensure they are ecologically, economically and socially sustainable. One of the steps in the MSP process is to identify special, unique marine areas (SUMA) and determine their need for research, management or protection.

On March 4th 2020 the Ministry of Natural Resources and Environment (MNRE), with technical support from the International Union for the Conservation of Nature (IUCN), conducted a Special, Unique Marine Areas (SUMA) workshop. The overall objective of the workshop was to

identify and map the special and/or unique marine areas of Samoa, including to:

- confirm existing inshore priority sites (KBAs);
- review current information to identify potential new inshore SUMAs;
- review current information to identify offshore SUMAs;
- map the boundaries of inshore and offshore SUMAs;
- update participants about the overall MSP Project.

This report consolidates the workshop outcomes by synthesising and reviewing all available information, including existing knowledge and literature, to describe each SUMA chosen by participants. It is a central building block significantly contributing to the foundation needed to implement MSP for Samoa by presenting and describing SUMAs within the country's Exclusive Economic Zone (EEZ). This layer of data will be one of approximately 140 datasets informing government decision-making about types of ocean zoning and levels of protection which should be afforded to different parts of Samoa's marine environment. The SUMAs described in this report can also be used by the government when considering: permitting and licencing decisions and conditions,environmental impact assessments, policy development and governance processes, coastal and ocean development planning and, assessing risks associated with various intended uses in particular locations.

This report describes the workshop and methods used to identify, describe and rate SUMAs in Samoa. The individual SUMAs are named, coded, justified, mapped, verified and scored in the results section.

5. METHOD

On March 4th 2020 a technical workshop was held to identify SUMAs in Samoa (Appendix 2). For the purpose of this work, "Special" is defined as "better, greater, or otherwise different from what is usual; exceptionally good or pleasant" and "Unique" is defined as "being the only one of its kind; unlike anything else" (Oxford English Dictionary, 2018). The workshop explicitly focussed only on biophysical values of the marine environment.

5.1 Data gathering

The Government of Samoa, together with the IUCN technical team, had collated, assessed, prepared and mapped open source and freely available data, in electronic or hard copy format, on the special and/or unique features of Samoa's marine environment (Appendix 3). In total, there were 23 datasets available for use in the workshop, of which four were related to natural risks, four to ocean uses, six to oceanography and thirteen to biodiversity. The total data have been delivered to all interested parties, including relevant government departments in Samoa.

5.2 Workshop and additional consultations

Nineteen participants representing a range of government ministries, CSOs and community fisheries experts were hosted to identify SUMAs in the inshore and offshore marine areas of Samoa (Appendix 1). These participants (and other contributors) had marine expertise on one or more of the following: inshore and offshore fish and other species, marine habitats and environments, high biodiversity areas, marine mammal areas, hydrology, findings from deep sea mineral explorations, oceanography, port works, fisheries and marine research.

Existing available data on Samoa's corals, geomorphology, mangroves and other key marine features were collated by the IUCN technical team to support the SUMA workshop. The MNRE also provided an overview and status of current priority sites for conservation in Samoa, including Key Biodiversity Areas (KBAs), Marine Protected Areas (MPAs) and community-based fish reserves. The IUCN technical

team presented the key criteria for selecting SUMA, which included (see also Rating of Samoa's special and/or unique marine areas):

1. the geographic explicitness (how specific is the boundary of the site);

2. the justification for selecting a site;

3. the type and number of information sources available for the site; and

4. national or international obligations (species or habitats) relevant to the site.

Participants were divided into groups and asked to identify and define Samoa's marine areas that were biologically and/or physically special and/or unique. In addition to the data described above, participants were provided with worksheets to complete for each site identified (Appendix 4). To mark these areas, participants were also provided with maps of Samoa which were roughly three scales: ocean-wide maps, dividing Samoa's marine jurisdiction into three vertical sections; province-scale maps highlighting the land and adjacent waters of each province; and other hardcopy maps which emphasised each island group (roughly at scales from 1: 300 000 to 1: 11 000).

The workshop required participants to provide, for each identified site:

- a site name;
- a geographic description of the site's location and boundaries;
- a justification. This could 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 of information. These could be peer reviewed scientific papers, peer reviewed reports, other ("grey literature") reports, traditional knowledge, data or personal communications from participants or other expert sources;
- legal or other obligations to protect the site or species within the site; and
- follow-up tasks required to finalise the description of the site.

The workshop was followed by an extensive search for sources of information, including from experts unable to attend the workshop. Information was collected through online libraries that linked to peer reviewed journals and online "grey" (unpublished) literature. Species-specific obligations were supplemented by compiling a list of species occurring in Samoan 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 site was created. A geographic boundary for each site was produced 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 Samoa's SUMAs.

5.3 Rating of Samoa's special and/or unique marine areas

Samoa has a vast range of marine biophysical features which range from well known and understood, special or unique, to potentially requiring particular consideration when planning for the optimal use and management of the country's ocean. Available information about each SUMA identified during the workshop, and consequently discussed in this report, varied. Hence, limited justification for a particular SUMA does not necessarily reflect its lack of importance, but rather a lack of previously conducted research about the area. 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. This is a relative assessment. For most sites, the exact boundaries were not well known and therefore the maps provided are indicative only. As with all the sites in this report, additional future information may result in improved definitions of boundaries.

NOTE: All sites identified in this report exclude land above the high-water mark. For example, if a site demarcates a ring around a fringing reef of an island, then the SUMA

is understood to include the entire marine environment within that ring only up to the high water mark, and not the island itself.

b. **Justification –** how well and in how much detail the SUMA's specialness and/or uniqueness can be justified. Is there available information about the site itself, or do we need to infer it from information about similar areas or habitats? This score refers to 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 or endemic species, important life stages of key species, or physically or biologically outstanding attributes such as 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 located in Samoa, then the score under the criterion "Justification" was diminished by one-half to a whole point. A half point was subtracted from the score potentially received if global site information was scarce (e.g. many offshore, deeper water sites). A full point was subtracted if a global wealth of site information exists, thereby increasing the chances of site-specific information (e.g. coral reefs).

c. **Information sources** – refers to the information sources used to identify and justify the site, such as websites, reports, legal documents or peer-reviewed scientific articles. This determines the sources' reliability and verifiability. Information that can be cross-referenced and triangulated via multiple information sources will more likely be correct.

   All the sites will have at least one, locally specific expert source, namely, one of the workshop participants. For some sites, only generic sources about the species or habitats in the SUMA will be available. In these cases, the generic sources will be counted as per the table below. For example, for the offshore, deeper water sites it is well understood that data are globally sparse and thus generic sources for these sites may be considered valid. However, for globally well-studied habitats, such as coral reefs or mangroves, thousands of generic sources exist. If these are included, each coral reef or mangrove SUMA will automatically receive the highest score. Therefore, for SUMAs containing globally well-studied species or habitats, only locally specific sources contribute to the criterion.

d. **National or international obligations** – do the areas host species or habitats for which the country has international obligations (e.g. under Conventions) or national obligations (e.g. under law)? Coral reefs automatically host a large number of organisms (e.g. even the corals themselves), so the "obligations" score for coral reef SUMAs is "1", with additional scores added for specific organisms for which the SUMA was listed.

Each proposed SUMA was scored as relatively low (1), medium (2) or high (3) against each of the four criteria. SUMAs 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. Sites scoring highly against just some of the criteria were nominated as medium-level SUMAs.

The scoring system used is described in the table on the next page. Three points are allocated as the top "score" for each of the four criteria (geographic explicitness, justification, source - including both type and number of sources - and national and international obligations). The highest score possible is 12; the lowest is four.

5.4 Overall prioritisation

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

Geographic Explicitness	
1	Boundaries are quite loosely defined
2	Boundaries broadly match topographic or hydrodynamic 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	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 peer-reviewed generic sources describing the main feature(s) of the site
Source Number	
½	One source
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

5.5 Layout of site information in report

For each SUMA identified in the workshop, this report provides the following information: a site name (for lesser known types of habitats 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 the last paragraph of Section 5.2 for details); a geographic boundary 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 site and its key attributes.

SITE NAME

MAP

A GEOGRAPHIC BOUNDARY DESCRIPTION

THE NUMBER AND TYPE OF SOURCES USED

Site O 3: *Geomorphological cluster 2*

Figure 4. Site O 3: Geomorphological cluster 2

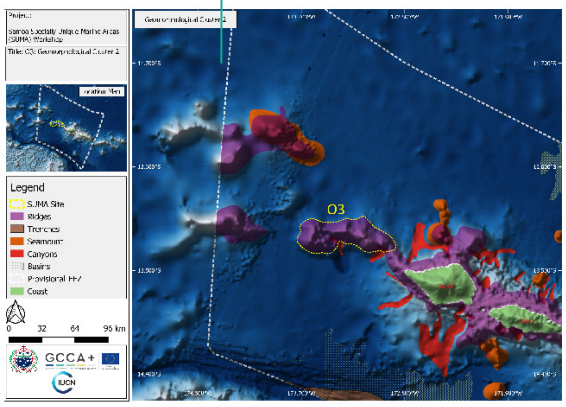
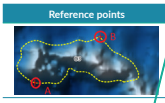


Table 3. Site O 3: Geomorphological cluster 2

Geographic Cluster	Site Name	Site Code	Overall Score
Offshore special, unique site	Geomorphological Cluster 2	O3	8.5

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	O3 A	-13.3471012387171	-173.613443587703
	O3 B	-13.026257625773	-173.149674277549

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Geographic description (score = 2)

This SUMA is a submarine ridge that forms the westward extension of Savai'i Island, known as the Stearns Bank (IHO, 2020). The geomorphological cluster includes the Tuapi'o and Si'usi'u Seamounts, both part of the Samoan Hotspot Trail on the Pacific Plate (Kendall and Poti, 2011; Koppers et al., 2008). The Tuapi'o Seamount is 3,465 m tall with the summit at a depth of 425 m and the ocean bottom at a depth of 3,890 m. It is considered small, with a volume of 3,397 km³, elongated in an east-west direction with slightly irregular edges (Koppers et al., 2010b). The summit of the Si'usi'u Seamount is at a depth of 1,269 m, and the seamount is 2,359 m high.

Justification (score = 2)

This SUMA was identified for its high biodiversity values, and as a marine mammal aggregation and migration area. Information about these values globally, and in Samoa generally, is detailed in Site O 2: Seamounts, ridges, guyots & escarpments and Site O 6: Whale migration route. Information presented there also pertains to this SUMA. The seamounts in these SUMAs have not been classified (GRID-Arendal, 2020), probably because they form part of a contiguous ridge, but parts of the SUMA have very high habitat suitability for cold-water corals (Davies and Guinotte, 2011). Modelling found that this area of Samoa's EEZ also has very high upwelling frequency (> 3.78%), indicating high primary productivity that favours aggregations of marine life (CMEMS, 2015a).

An area surrounding the main islands, measuring 12,548 km² and extending into the southern portion of this SUMA, has been identified as an "Important Marine Mammal Area", or IMMA (Marine Mammal Protected Areas Taskforce, 2020). The criteria that led to the inclusion of this area include high abundance of humpback whales, spinner dolphins and rough-toothed dolphins, and the overall diversity of marine mammals (see also Site O 6: Whale migration route).

Type and number of sources (score = 2.5)

Two geological websites, one report and two peer-reviewed papers contained information specific to this SUMA. One map that showed modelled biophysical values had information specific to this SUMA, and one website had information about the importance of this general area for marine mammals. The general sources used to describe seamounts for Site O 2: Seamounts, ridges, guyots & escarpments and marine mammals for Site O 6: Whale migration route are also relevant here.

Obligations (score = 2)

There are obligations to protect and sustainably manage many fish species, including some associated with seamounts, within the Fisheries Management Act 2016. The Land Surveys and Environment Act 1989 also describes obligations to protect some of the features associated with seamounts. Marine mammals and some sharks found around seamounts are included in IUCN Red List of Threatened Species, the Convention on Migratory Species (CMS), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The Marine Wildlife Protection Regulations 2009 provide for the protection of marine mammals, turtles, sharks and species of conservation concern, such as those listed on international agreements.

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A SUMMARY TABLE WITH THE NAME AND SCORE OF THE SITE

THE DIAGONAL COORDINATES

A DESCRIPTIVE JUSTIFICATION FOR THE INCLUSION OF THE SITE

THE INTERNATIONAL AND NATIONAL OBLIGATIONS PERTAINING TO THE SITE AND ITS KEY ATTRIBUTES

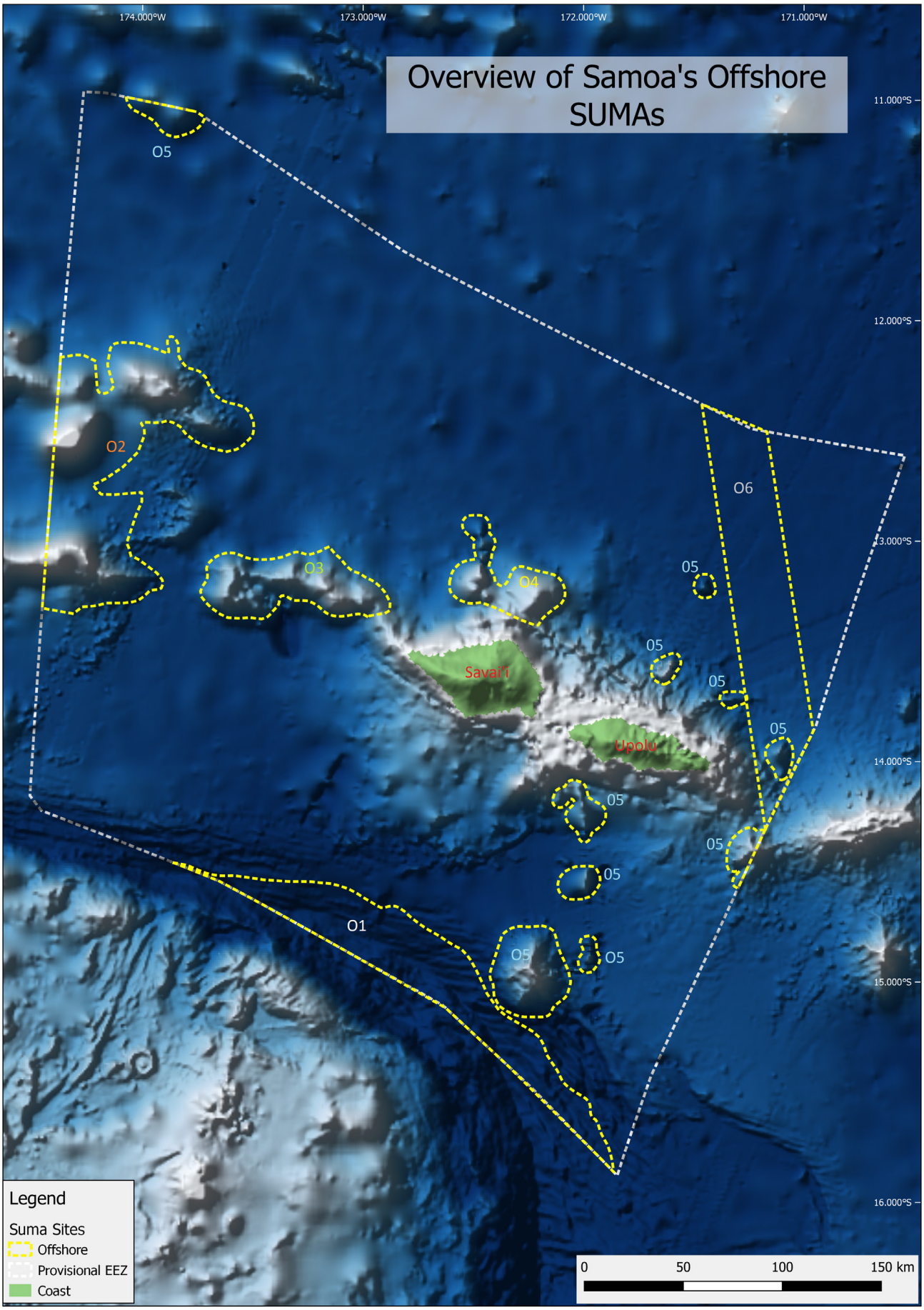
6 Results

This section provides information on all the SUMAs for Samoa identified during the expert workshop on 4th March 2020 and during follow-up research. The SUMAs are grouped and presented as offshore followed by inshore sites.

6.1 Offshore biophysically special and/or unique marine areas

All the offshore SUMAs within Samoa's EEZ are depicted in the figure below.

Figure 1. Overview of Samoa's offshore SUMA sites.



Site O 1: *Southern Trench*

A trench is “a long, narrow, characteristically very deep and asymmetrical depression of the sea floor, with relatively steep sides” (IHO, 2008a). Trenches are generally distinguished from flat-bottomed troughs by their “V” shape in cross-section. Ocean trenches are the deepest parts of the ocean, commonly 6 to 10 km in depth (IHO, 2008a).

Figure 2. Site O 1: Southern Trench

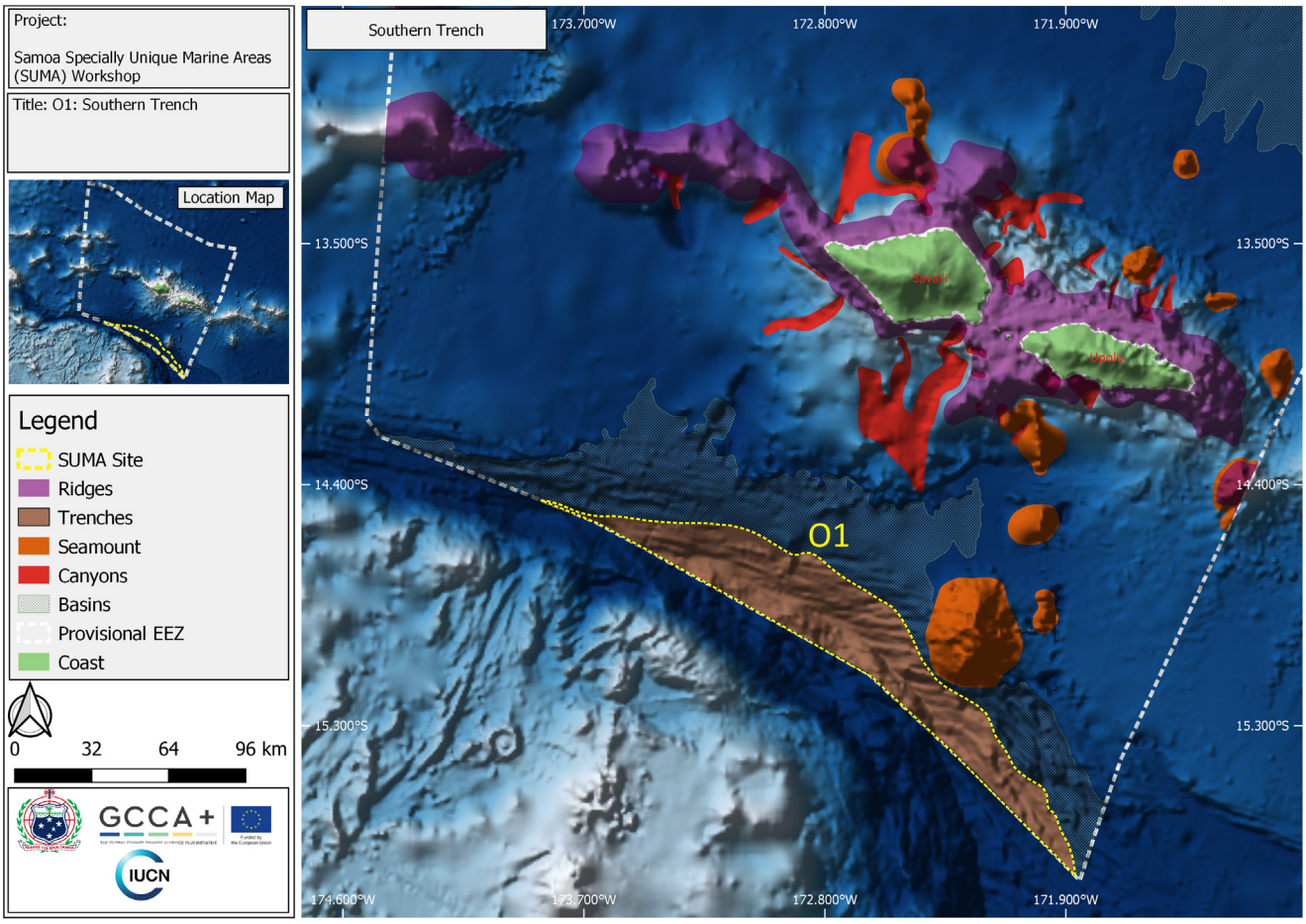
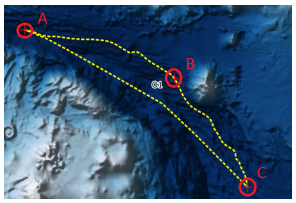


Table1. Site O 1: Southern Trench

Geographic Cluster	Site Name	Site Code	Overall Score
Offshore special, unique site	Southern Trench	O1	8.5

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	O1 A	-14.4592629219276	-173.858425819102
	O1 B	-14.8976909190058	-172.514361838021
	O1 C	-15.8616703384386	-171.863697269349

Geographic description (score = 2)

The Southern Trench SUMA is the northern portion of the Tonga Trench, at the subduction juncture of the Pacific and Indo-Australian Plates. The Tonga Trench is 1,375 km in length and forms the eastern boundary of the Tonga Ridge. The boundary of the trench is defined by Harris *et al.* (2014). The western end of the SUMA leads into the Vitiaz Lineament, a continuation of the northern end of the Tonga Trench (Hart *et al.*, 2004). The part of the Trench within this SUMA is between 5,300 and 7,600 m deep, and between two and eight km wide at the base (Hill and Tiffin, 1993), with an average depth of 7,100 m (Wright *et al.*, 2000).

Justification (score = 1.5)

This SUMA was selected for its unique habitat values. Ocean trenches contain the deepest biozones in the oceans, the abyssal (3,000–6,500m deep) and hadal zones (6,500–11,000m deep), both of which occur within the Tonga Trench (Jamieson, 2011). The Tonga Trench is on average 6,000 m deep and 80 km wide, reaching a maximum depth at Horizon Deep of 10,882 m (only 180m less than the deepest point of the ocean, the Mariana Trench) (Jamieson, 2011; Raitt *et al.*, 1955).

Generally, this deepwater habitat is known to host unique communities with high levels of species endemism due to their geographic isolation (IHO, 2008b; Jamieson, 2011). Species that inhabit trench ecosystems are adapted to conditions of darkness, extreme hydrostatic pressure, low temperature and limited food supply (Blankenship *et al.*, 2006). There is intense geological and tectonic activity in this corner of the Trench, which is thought to be migrating rapidly eastward at ~190 mm per year (Hart *et al.*, 2004). The volcanic and seismic activity in this part of the Trench is part of what makes Samoa a geological "hotspot" (Koppers *et al.*, 2008).

In 2012, the Scripps Institute undertook an expedition from Apia to the northern part of the Tonga Trench to conduct research in, or very close to, this SUMA (https://www.livescience.com/23431-tonga-tench-mission.html). They deployed cameras and collected water and sediment samples from depths of up to 9,000 m to study microbial communities (Kharbush *et al.*, 2016). Another study found a distinctive vertical zonation in scavenging amphipods close to this section of the Trench, suggesting that species coexisting in this harsh environment require foraging flexibility and deviations in reproductive traits, behaviours, and nutritional strategies to avoid direct competition (Blankenship *et al.*, 2006; Blankenship and Levin, 2007).

Globally, over 1,000 species have been recorded in the hadal zone (> 6,500m), including fish and crustaceans (and excluding bacteria); some of these have been recorded from the Tonga Trench (Jamieson, 2015; Jamieson *et al.*, 2009). Because trench-associated animals are unable to cross the adjacent relatively shallow ocean, trenches are biologically isolated from each other (IHO, 2008b; Lacey *et al.*, 2016). In the Tonga Trench, hydrostatic pressure and temperature are the strongest drivers of intra-trench assemblage composition, with a unimodal pattern of species diversity, peaking between 4,000 and 5,000m (Lacey *et al.*, 2016).

Different species assemblages occupy different depths along the slope of the Tonga Trench, and this pattern is most likely carried through to the associated ridge system (Jamieson, 2015). Trench topography provides a unique setting with regards to food supply, because organic matter (food) is accumulated at the deepest trench axis (Jamieson, 2011). This means that sometimes the deep trench seabed accumulates nutrients, and therefore hosts higher abundance and biomass of organisms than shallower portions of the trench slope (Leduc *et al.*, 2016).

The waters above the Trench and associated ridge system support migrating sperm whales (pers. comm. T. Halafihi, CBD, 2011) and aggregations of marine mammals (SUMA workshop participants, pers. comm.). The waters over submarine canyons and trenches are the preferred habitat of the largest of the toothed whales, sperm whales, as they undertake deep dives to hunt for food, spending only around 13% of their time on the surface (Whitehead, 2002). Their association with upwellings and geomorphic features such as steep seamounts and canyons makes them useful indicators of hotspots of biodiversity and productivity (Mannocci *et al.*, 2015). Modelling shows that the waters above the Tonga Trench have the highest dissolved oxygen concentration of the Samoan EEZ, suggesting high primary productivity (VLIZ, 2014).

The Antarctic blue whale has been detected in the Lau Basin and in the northern Tonga Trench, within or close to this SUMA (Balcazar *et al.*, 2017). Their calls were detected in June 2010, gradually increasing to a peak in December of that year. This was the first study to detect Antarctic blue whale calls in tropical waters during the summer, though the reason for their frequency in these waters remains unknown

(Balcazar *et al.*, 2017). The entire Tonga Trench,which includes the portion in Samoan waters, is specifically named as one of the features in the Ecologically and Biologically Significant Area (EBSA) 26 – Tongan Archipelago – for its extreme depth and unique fauna. Samoa's status as a geological hotspot is also recognised (Secretariat of the Convention on Biological Diversity, 2014).

Type and number of sources (score = 3)

The Tonga Trench has been studied from a geological perspective since the 1950s (Crawford *et al.*, 2003; Foley and Long, 2011; Raitt *et al.*, 1955), due to resource-driven interests and the feasibility of using remote sampling. Much less work has focused on the biology of the Tonga Trench, and the northern region of the Tonga Trench (in Samoan waters) in particular. However, this report draws upon ten relevant peer reviewed papers describing patterns elsewhere in the Trench. Three further sources – the Scripps Institute website, a VLIZ map and the EBSA report – albeit mostly geological, are from within the SUMA .

Obligations (score = 2)

The Agriculture and Fisheries Ordinance 1959, the Fisheries Management Act 2016, and the Land Surveys and Environment Act 1989 have relevant regulations pertaining to the protection of deepwater habitats and/or the species found here. Whales, which may be using the trench for feeding or during migration, are on the IUCN Red List of Threatened Species and also included in the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The Marine Wildlife Protection Regulations 2009 provide for the protection of marine mammals, turtles, sharks and species of conservation concern, such as those listed on international agreements.

Site O 2: *Seamounts, ridges, guyots & escarpments*

Seamounts are “a discrete (or group of) large isolated elevation(s), greater than 1,000 m in relief above the sea floor, characteristically of conical form. Ridges are defined as “an isolated (or group of) elongated narrow elevation(s) of varying complexity having steep sides, often separating basin features” (IHO, 2008a). Guyots began as emergent seamounts and were then eroded, flattened and submerged (Harris *et al.*, 2014). Escarpments are elongated and comparatively steep slopes separating flat or gently sloping areas (IHO, 2008b).

Figure 3. Site O 2: Seamounts, ridges, guyots & escarpments

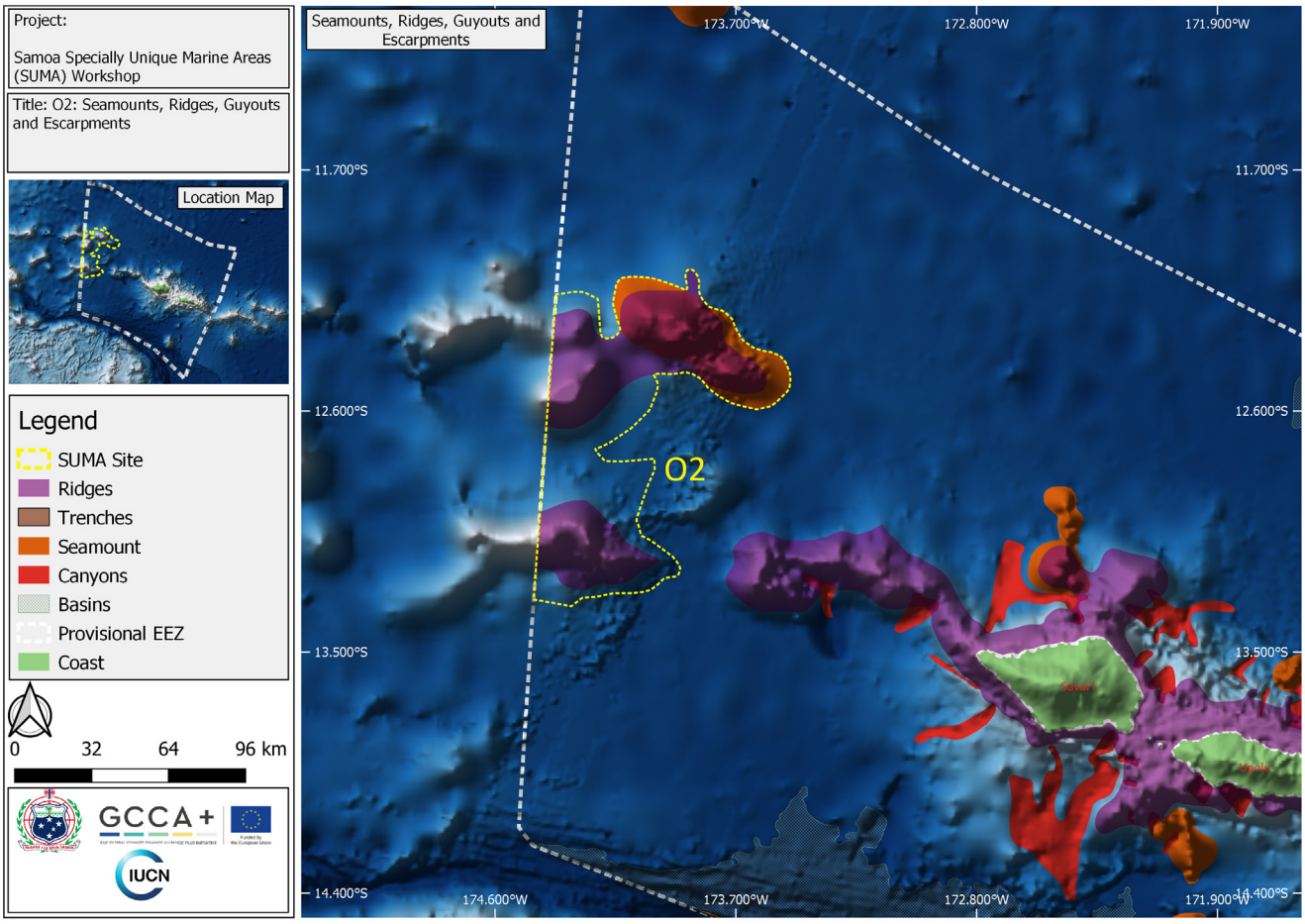


Table 2. Site O 2: Seamounts, ridges, guyots & escarpments

Geographic Cluster	Site Name	Site Code	Overall Score
Offshore special, unique site	Seamounts, Ridges, Guyots & Escarpments	O2	10.5

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	O2 A	-13.3040184836617	-174.455802999663
	O2 B	-12.3943830025062	-173.534182200076
	O2 C	-12.0728556388552	-173.878436622866

Geographic description (score = 2)

This SUMA encompasses a cluster of geomorphological features at the western edge of the EEZ, including seamounts, ridges, guyots and escarpments. Samoa has 17 seamounts and guyots located wholly or partially within its EEZ, at least four of which occur in this SUMA (Figure 3). This area contains the Pasco Bank, and includes the Pasco, Toafe'ai and Toafilemu seamounts and three unnamed seamounts numbered 30, 38 and 39 in Kendall and Poti (2011); two of these have been variously known as the Horseshoe and Field guyots (Birkeland *et al.*, 2007; Hart *et al.*, 2004). Their heights range from 601 to 3,051 m, and their depths from the ocean's surface range from 3,032 to 30m (Kendall and Poti, 2011).

Justification (score = 2.5)

This SUMA was selected for its seamounts, a large number of geomorphological features associated with high biodiversity, and its role in the migration pathways and aggregations of marine mammals. The Pasco Banks is a long ridge-like seamount that rises to within 30 m of the surface, with coral reef habitats in its shallower reaches, and is considered one of the four main geological "provinces" of Samoa (Hill and Tiffin, 1993). Areas of complex geomorphology, such as those within this SUMA, are known as oceanic "hotspots" of life (Davoren, 2013), and are widely known to host higher biodiversity than surrounding waters, supporting rich benthic communities and attracting pelagic organisms (Letessier *et al.*, 2019).

As seamounts in Samoa have been poorly studied, much information is derived from other known seamounts in the area, especially American Samoa and Tonga. However, the ecological communities of one seamount may not necessarily be similar to those nearby. For example, Vailulu'u Seamount in American Samoa, which has been relatively well studied, is the only hydrothermally active seamount in the general area (Koppers *et al.*, 2010a; Staudigel *et al.*, 2006).

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, eleven types of seamounts occur; Samoa has five types of seamounts (Harris *et al.*, 2014). This SUMA contains three seamounts classified as Group 2 ("large and tall with shallow peak: shallow") and one as Group 3 ("intermediate size, large, tall and deep"); only one other Group 2 seamount is found in Samoa's EEZ (GRID-Arendal, 2020).

Seamounts with summits in the 30-150 m depth range are also likely to host mesophotic coral reefs; Pasco and To'afilemu Seamounts fall within this range, and potentially host 279 km^2 of coral reef ecosystem (see Table 6). Mesophotic coral reefs occur at depths that can support light-sensitive corals and are usually dominated by a combination of sponges, macroalgae and corals as the habitat-forming organisms (Hinderstein *et al.*, 2010). These reefs can be highly biodiverse and have the potential to act as temporary climate refugia for shallow reef organisms. This is due to their depth range, which may minimise their exposure to increased sea-surface temperatures and intensified wave action, causing increasing degradation on shallow reefs (Linklater *et al.*, 2019; Muir *et al.*, 2018).

Benthic taxa living below the photic zone on seamounts can include biogenic habitat-forming corals and sponges, anemones, crabs, sea stars, sea urchins, brittle stars, sea cucumbers, monoplacophorans and feather stars (Baker and Beaudoin, 2013; Clark *et al.*, 2011; CSIRO, 2008; Sigwart *et al.*, 2019). This area has very high habitat suitability for cold-water corals (Davies and Guinotte, 2011). These bioherm-forming corals can build extensive reef structures at depths of 1,000–2,000 m, providing an important habitat for a rich variety of seamount biota. They are however highly vulnerable to damage due to their extremely slow-growing life history (Fallon *et al.*, 2014).

The deepwater seamount communities often have a high level of endemism, and likely to have different fauna on the leeward and windward sides (Marchese, 2014; Stone *et al.*, 2004). Species may be restricted to a chain of seamounts, to a few adjacent seamounts (such as the seascape in this SUMA) 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. However, seamounts and seamount-like features (e.g. ridges) can support high levels of endemism without being particularly large or isolated. 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 400 m above the seafloor) had rates of endemism of 15 to 35%.

Work in Tonga by Halafihi (2015) using chemical analysis of otoliths supports the premise of relative isolation of populations on seamounts by finding independent

populations of the flame snapper (Etelis coruscans) and crimson jobfish (Pristipomoides filamentosus) on seamounts in the north and south of Tonga. Hydrodynamic modelling shows that seamounts in this SUMA are a significant source of larvae, with up to 8,000 larvae spawned (the second-highest category) (Kendall and Poti, 2011). The impact on the endemism rates of the seamounts in Samoa is unknown. However, the SUMA may be important for downstream habitats in times of recovery from disturbance (Jones *et al.*, 2007).

Modelling found that this area of Samoa's EEZ has very high upwelling frequency and high nitrate concentrations indicating high primary productivity that favours aggregations of marine life (CMEMS, 2015a; CSIRO, 2009). Many seamounts exhibit a "positive biological cascade" effect, with elevated levels of primary productivity leading to higher concentrations of zooplankton, which can support a high abundance of benthic fauna and consequently large populations at higher trophic levels (Stone *et al.*, 2004). This is likely to attract deepwater and pelagic species such as tuna, deep-water snapper, sharks, whales and dolphins (Baker and Beaudoin, 2013; Morato and Clark, 2007; Stone *et al.*, 2004).

The Pasco Banks is known to attract high densities of pelagic predators, including dogtooth tuna (Gymnosarda unicolor), wahoo (Acanthocybium solandri), skipjack tuna (Katsuwonus pelamis), marlin (Makaira mazara), yellowfin tuna (Thunnus albacares) and sailfish (Istiophorus platypterus)(The Fishing Website, 2020). These higher-order predators are known to play a key role in structuring pelagic and benthic trophic webs (Estes *et al.*, 2011).

Seamounts often host deepwater species that are very slow-growing and long-lived (Stone *et al.*, 2004). Deepwater snappers such as Etelis coruscans and E. carbunculus are examples of this, and both are found in the general Samoan archipelago (O'Malley *et al.*, 2019). Seamounts in Tonga have been noted to include endangered species such as the convict grouper, Epinephelus octofsciatus (pers. comm. T. Halafihi); Samoan seamounts are likely to host similar species. Combined with highly variable recruitment due to isolation and intermittent dispersal from other seamounts (if the species are not endemic to that seamount), this results in very delicate habitats with poor recovery potential vulnerable to overexploitation (Baker and Beaudoin, 2013; Stone *et al.*, 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 unknown and unpredictable (Baker and Beaudoin, 2013; Stone *et al.*, 2004). In Tonga, Halafihi (2015) identified different chemical signatures in otoliths of juveniles and adults of the flame snapper and crimson jobfish, indicating that these deepwater fishes use different parts of a seamount at different life-stages. 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 (CSIRO, 2008; Stone *et al.*, 2004).

Seamounts, ridges and the seascapes between them, including shallower areas, play an important role for marine mammals during migration, breeding and feeding (Garrigue *et al.*, 2015). The seamounts and ridges are also probably resting areas, navigational landmarks or even supplemental feeding grounds for whales (Garrigue *et al.*, 2015). Telemetry studies have shown significant levels of individual fidelity to specific sites, such as seamounts, by highly migratory marine species, and basin-wide movements can be directed towards these locations (Luschi, 2013). However, research on marine mammals has not been conducted within this SUMA.

Type and number of sources (score = 3)

Three peer-reviewed papers, one website, one report and three maps that showed modelled biophysical values had information specific to this SUMA. General information about the biophysical attributes and values of the geomorphological features in this SUMA was reviewed from 20 peer-reviewed papers. Information about nearby areas was drawn from another four peer-reviewed papers which were geologically focused.

Obligations (score = 3)

There are obligations to protect and sustainably manage many fish species, including some associated with seamounts, within the Fisheries Management Act 2016. The Land Surveys and Environment Act 1989 also describes obligations to protect some of the features associated with seamounts. Marine mammals and some sharks found around seamounts are included in the IUCN Red List of Threatened Species, the Convention on Migratory Species (CMS), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The Marine Wildlife Protection Regulations 2009 provides for the protection of marine mammals, turtles, sharks and species of conservation concern, such as those listed in international agreements.

Site O 3: *Geomorphological cluster 2*

Figure 4. Site O 3: Geomorphological cluster 2

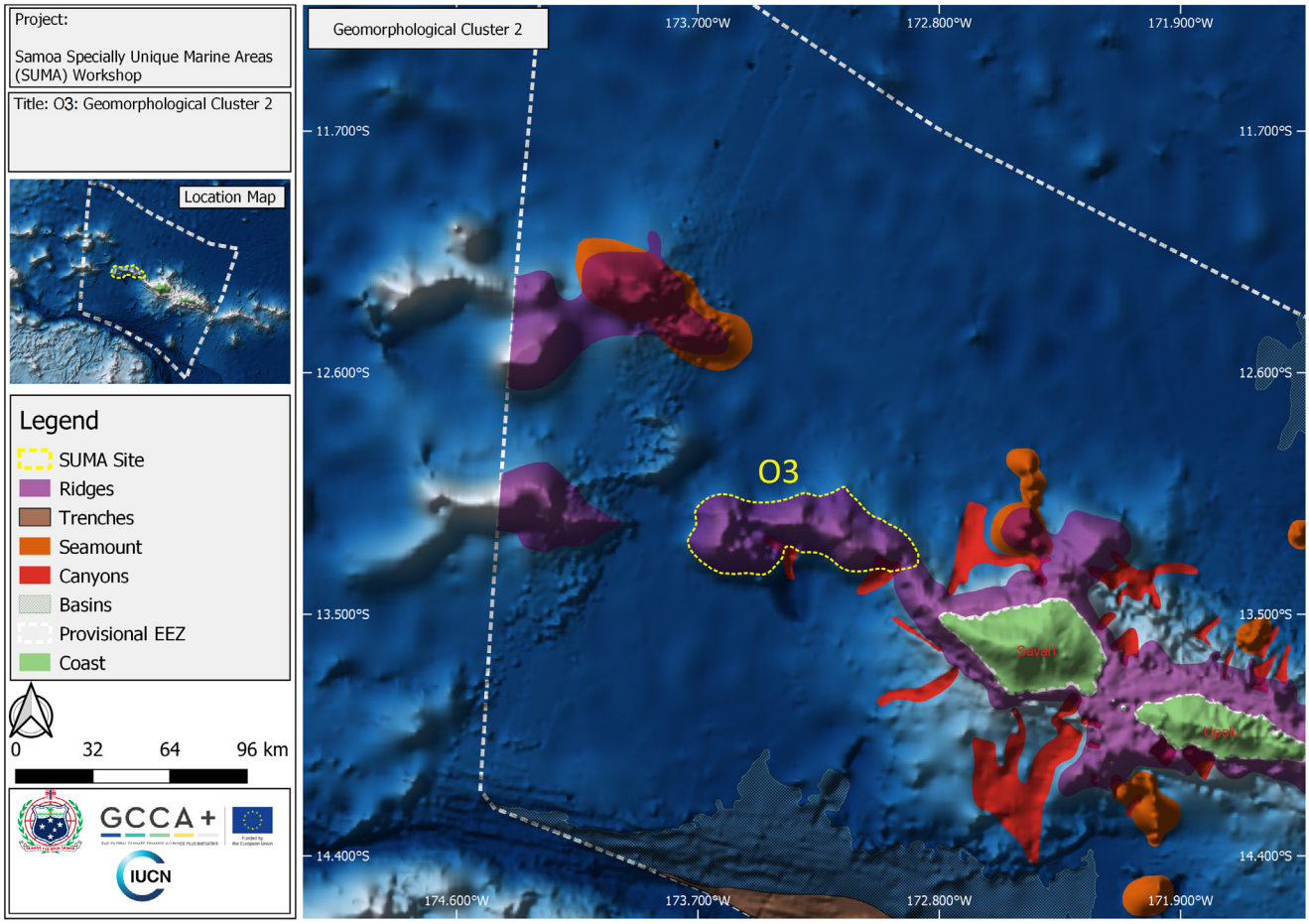
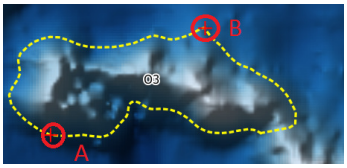


Table 3. Site O 3: Geomorphological cluster 2

Geographic Cluster	Site Name	Site Code	Overall Score
Offshore special, unique site	Geomorphological cluster 2	O3	8.5

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	O3 A	-13.3471012387171	-173.613443587703
	O3 B	-13.026257625773	-173.149674277549

Geographic description (score = 2)

This SUMA is a submarine ridge that forms the westward extension of Savai'i Island, known as the Stearns Bank (IHO, 2020). The geomorphological cluster includes the Tuapi'o and Si'usi'u Seamounts, both part of the Samoan Hotspot Trail on the Pacific Plate (Kendall and Poti, 2011; Koppers *et al.*, 2008). The Tuapi'o Seamount is 3,465 m tall with the summit at a depth of 425 m and the ocean bottom at a depth of 3,890 m. It is considered small, with a volume of 3,397 km^3, elongated in an east-west direction with slightly irregular edges (Koppers *et al.*, 2010b). The summit of the Si'usi'u Seamount is at a depth of 1,269 m, and the seamount is 2,359 m high.

Justification (score = 2)

This SUMA was identified for its high biodiversity values, and as a marine mammal aggregation and migration area. Information about these values globally, and in Samoa generally, is detailed in Site O 2: Seamounts, ridges, guyots & escarpments and Site O 6: Whale migration route. Information presented there also pertains to this SUMA. The seamounts in these SUMAs have not been classified (GRID-Arendal, 2020), probably because they form part of a contiguous ridge, but parts of the SUMA have very high habitat suitability for cold-water corals (Davies and Guinotte, 2011). Modelling found that this area of Samoa's EEZ also has very high upwelling frequency (> 3.78%), indicating high primary productivity that favours aggregations of marine life (CMEMS, 2015a).

An area surrounding the main islands, measuring 12,548 km^2 and extending into the southern portion of this SUMA, has been identified as an "Important Marine Mammal Area", or IMMA (Marine Mammal Protected Areas Taskforce, 2020). The criteria that led to the inclusion of this area include high abundance of humpback whales, spinner dolphins and rough-toothed dolphins, and the overall diversity of marine mammals (see also Site O 6: Whale migration route).

Type and number of sources (score = 2.5)

Two geological websites, one report and two peer-reviewed papers contained information specific to this SUMA. One map that showed modelled biophysical values had information specific to this SUMA, and one website had information about the importance of this general area for marine mammals. The general sources used to describe seamounts for Site O 2: Seamounts, ridges, guyots & escarpments and marine mammals for Site O 6: Whale migration route are also relevant here.

Obligations (score = 2)

There are obligations to protect and sustainably manage many fish species, including some associated with seamounts, within the Fisheries Management Act 2016. The Land Surveys and Environment Act 1989 also describes obligations to protect some of the features associated with seamounts. Marine mammals and some sharks found around seamounts are included in IUCN Red List of Threatened Species, the Convention on Migratory Species (CMS), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The Marine Wildlife Protection Regulations 2009 provide for the protection of marine mammals, turtles, sharks and species of conservation concern, such as those listed on international agreements.

Site O 4: *Geomorphological cluster 3*

Figure 5. Site O 4: Geomorphological cluster 3

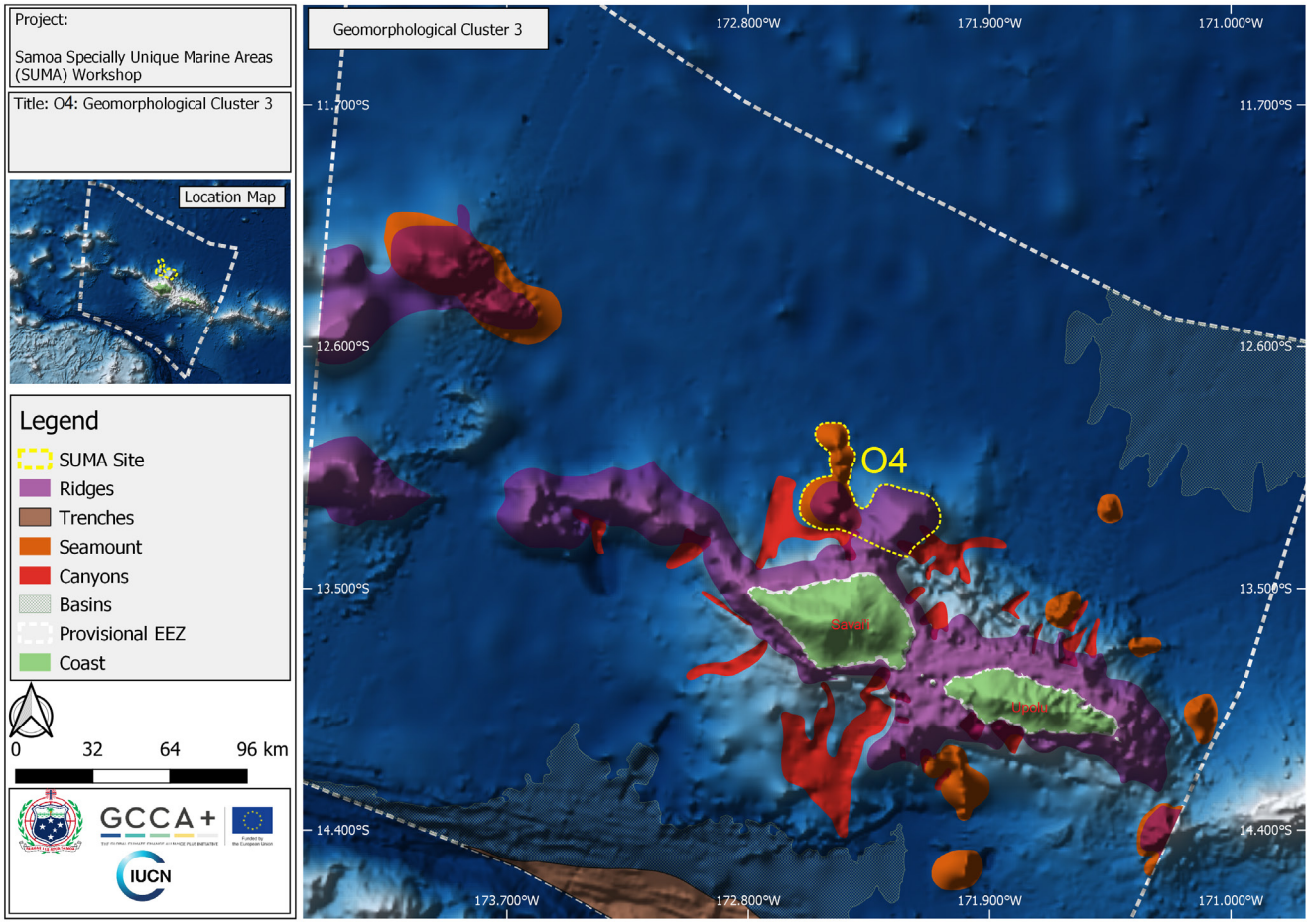
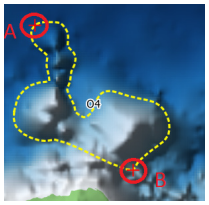


Table 4. Site O 4: Geomorphological cluster 3.

Geographic Cluster	Site Name	Site Code	Overall Score
Offshore special, unique site	Geomorphological cluster 3	O4	8

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	O4 A	-12.8935576280266	-172.537589622693
	O4 B	-13.3811760039587	-172.206236696321

Geographic description (score = 2)

This SUMA is a cluster of submarine ridge and guyots to the north of the island of Savai'i. Agavale Seamount, which makes up the western half of the SUMA, is 1,986 m tall with the summit at a depth of 995 m. Taumatau Seamount is 2,220 m high with the summit at a depth of 820 m and the ocean bottom at a depth of 3,040 m. Considered very small with a volume of 869 km^3, Taumatau seamount is relatively round and regular, with smooth edges.

Justification (score = 2)

This SUMA was identified for its high biodiversity values, and as a marine mammal aggregation and migration area. Information about these values globally, and in Samoa generally, is detailed in Site O 2: Seamounts, ridges, guyots & escarpments and Site O 6: Whale migration route. The information presented there also pertains to this SUMA. Agavale Seamount is classified as Group 3 ("intermediate size, large, tall and deep") (GRID-Arendal, 2020); Taumatau Seamount is not classified. This area has very high habitat suitability for cold-water corals, especially around the peak of Taumatau Seamount (Davies and Guinotte, 2011). Modelling also found that this area of Samoa's EEZ has very high upwelling frequency (> 3.78%), indicating high primary productivity that favours aggregations of marine life (CMEMS, 2015a).

An area surrounding the main islands, measuring 12,548 km^2 and extending into the southern portion of this SUMA, has been identified as an "Important Marine Mammal Area", or IMMA (Marine Mammal Protected Areas Taskforce, 2020). The criteria that led to the inclusion of this area include the abundance of humpback whales, spinner dolphins and rough-toothed dolphins, and the overall diversity of marine mammals (see also Site O 6: Whale Migration Route).

Type and number of sources (score = 2)

Two geological websites, one report and two peer-reviewed papers contained information specific to this SUMA. Two maps that showed modelled biophysical values had information specific to this SUMA, and one website had information about the importance of this general area for marine mammals. The general sources used to describe seamounts for Site O 2: Seamounts, ridges, guyots & escarpments and marine mammals for Site O 6: Whale migration route are also relevant here.

Obligations (score = 2)

There are obligations to protect and sustainably manage many fish species, including some associated with seamounts, within the Fisheries Management Act 2016. The Land Surveys and Environment Act 1989 also describes obligations to protect some of the features associated with seamounts. Marine mammals and some sharks found around seamounts included in the IUCN Red List of Threatened Species, in the Convention on Migratory Species (CMS), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The Marine Wildlife Protection Regulations 2009 provides for the protection of marine mammals, turtles, sharks and species of conservation concern, such as those listed in international agreements.

Site O 5: *Northern and eastern seamounts*

Figure 6. Site O 5: Northern and eastern seamounts

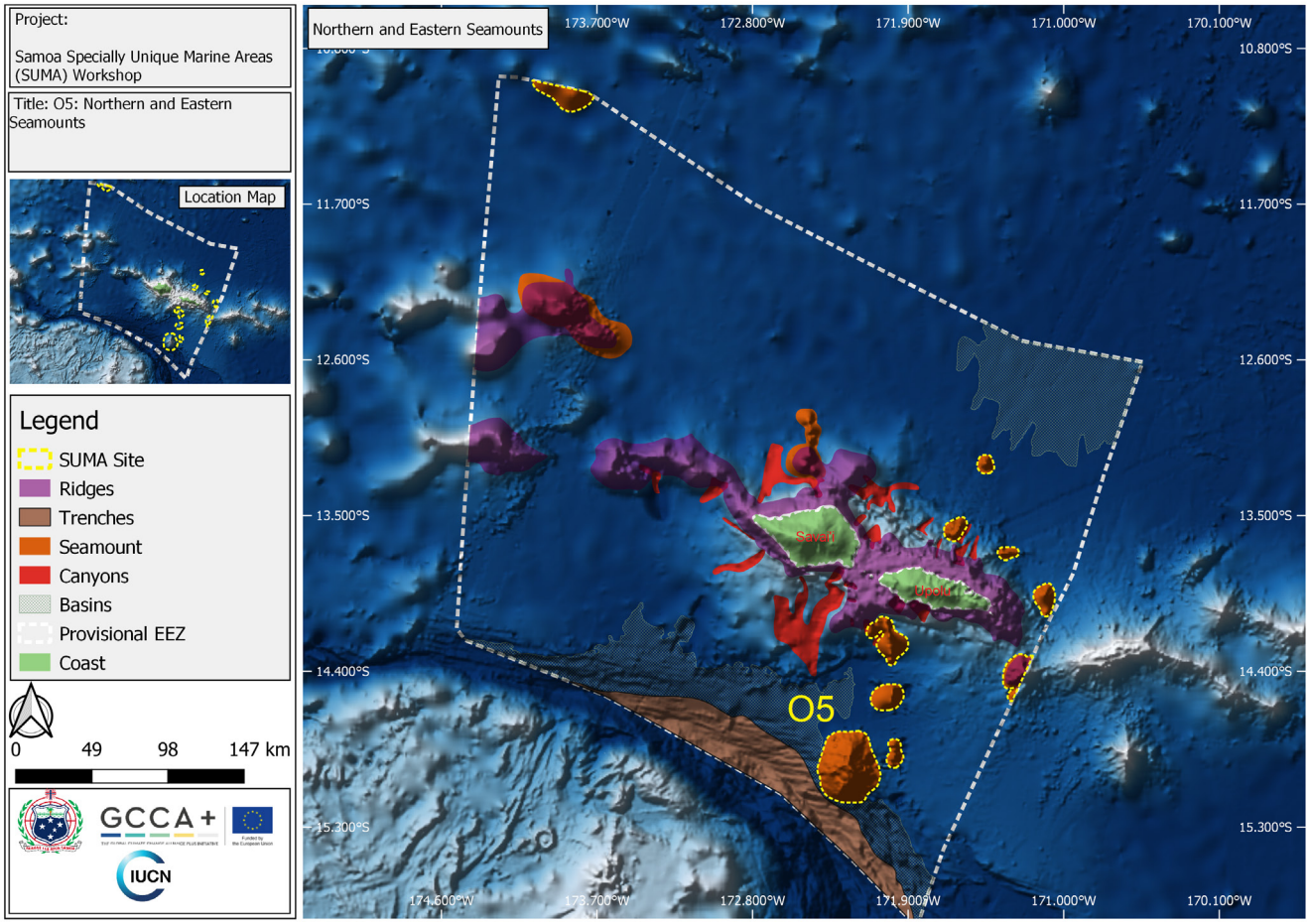
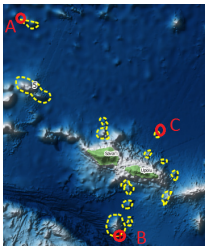


Table 5. Site O 5: Northern and eastern seamounts.

Geographic Cluster	Site Name	Site Code	Overall Score
Offshore special, unique site	Northern and eastern seamounts	O5	8

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	O5 A	-10.98514518	-174.0746709
	O5 B	-15.15213022	-172.1604661
	O5 C	-13.15717271	-171.4224675

Geographic description (score = 1)

This SUMA Includes ten of the 17 seamounts and guyots found in Samoan waters, which are spread primarily across the eastern portion of Samoa's EEZ, with one seamount in the northwestern corner of the EEZ (Table 6).

Justification (score = 2)

This SUMA was identified for its high biodiversity values and as a marine mammal aggregation and migration area. Information about these values globally, and in Samoa generally, is detailed in Site O 2: Seamounts, ridges, guyots & escarpments and Site O 6: Whale migration route. The information presented there also pertains to this SUMA. In total, there are five types of seamounts wholly or partially in Samoan waters: six Groups 3 (intermediate size, large, tall and deep); four Group 2 (large and tall with shallow peak: shallow); two Group 4 (small with deep peak; most common type); one Group 4 (small with deep peak; short with moderately deep peak); and two Group 5 (small and short with very deep peaks; deepest type) (GRID-Arendal, 2020).

This SUMA contains one of the Group 2 seamounts, four of the Group 3 seamounts, and all the Group 4 (both types) and Group 5 seamounts in Samoa's EEZ (Table 6). Modelling found that the northern portion of the seamounts lie in waters with very high upwelling frequency (> 3.78%), indicating high primary productivity that favours aggregations of marine life (CMEMS, 2015a). Geomorphological descriptions are available for three of the seamounts in this SUMA, but biological information about Samoa's seamounts is generally lacking (MNRE, 2013).

Uo Mamae Seamount, also known as the Machias Guyot, is part of the Samoan Seamount Chain. It has a relatively small (60 km) basal diameter and the top surface, which is a carbonate platform, reaches a depth of 600 m. It is elongated in a NW-SE direction and has a flat area at ~750 m that is about 2.5 km wide and 8 km long. The guyot is located near the bend of the Tonga Trench, adjacent to Site O 1: Southern Trench.

The northwest flank of the seamount has several volcanic cones 1-4 km in diameter, which appear to postdate the overall formation of the guyot (Koppers *et al.*, 2010b). It lies in an area with very high (> 21.8%) downwelling eddy frequency and high dissolved oxygen concentration, indicating high primary productivity and the potential for aggregations of marine life (CMEMS, 2015b; VLIZ, 2014). This seamount also has very high habitat suitability for cold-water corals (Davies and Guinotte, 2011). The summit is smooth, which suggests undisturbed sediment cover, and foraminiferal ooze is thought to blanket the guyot

Table 6. Morphotypes and characteristics of seamounts present in this SUMA. Names, where available, are reproduced from Kendall and Poti (2011).

ID or name	Area (km²)	Height (m)	Peak depth (m)	Type	Description
1	141.68	2,999	2,367	3	Group 3: intermediate size, large tall and deep
Uo Mamae	1,406.05	5,017	601	10	Group 2: large and tall with shallow peak: shallow
3	278.42	3,319	1,774	3	Group 3: intermediate size, large tall and deep
Tisa	639.96	2,862	866	3	Group 3: intermediate size, large tall and deep
5	433.65	2,996	1,778	3	Group 3: intermediate size, large tall and deep
Unnamed Seamount 43	205.42	1,694	2,641	2	Group 4: small with deep peak, most common type
7	85.79	1,221	3,327	2	Group 4: small with deep peak, most common type
8	158.36	2,156	2,283	1	Group 4: small with deep peak, short with moderately deep peak
Unnamed Seamount 41	102.92	1,555	3,350	8	Group 5: small and short with very deep peaks, deepest type
12	785.04	1,340	3,430	8	Group 5: small and short with very deep peaks, deepest type

(Coulbourn *et al.*, 1989). Hawkins and Natland (1975) dredged cobbles, gravel, pahoehoe, and coral (presumably cold-water corals) from a depth of 1,380 m.

Type and number of sources (score = 3)

One geological website, two reports and four peer-reviewed papers contained information specific to this SUMA, although this was mostly geomorphological. Three maps that showed modelled biophysical values had information specific to this SUMA, and one website had information about the importance of this general area for marine mammals. The general sources used to describe seamounts for Site O 2: Seamounts, ridges, guyots & escarpments and marine mammals for Site O 6: Whale migration route are also relevant here.

Obligations (score = 2)

There are obligations to protect and sustainably manage many fish species, including some associated with seamounts, within the Fisheries Management Act 2016. The Land Surveys and Environment Act 1989 also describes obligations to protect some of the features associated with seamounts. Marine mammals and some sharks found around seamounts included in the IUCN Red List of Threatened Species, in the Convention on Migratory Species (CMS), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The Marine Wildlife Protection Regulations 2009 provides for the protection of marine mammals, turtles, sharks and species of conservation concern, such as those listed in international agreements.

Site O 6: Whale migration route

Humpback whales undertake extensive annual migrations using consistent migratory pathways.

Figure 7. Site O 6: Whale migration route

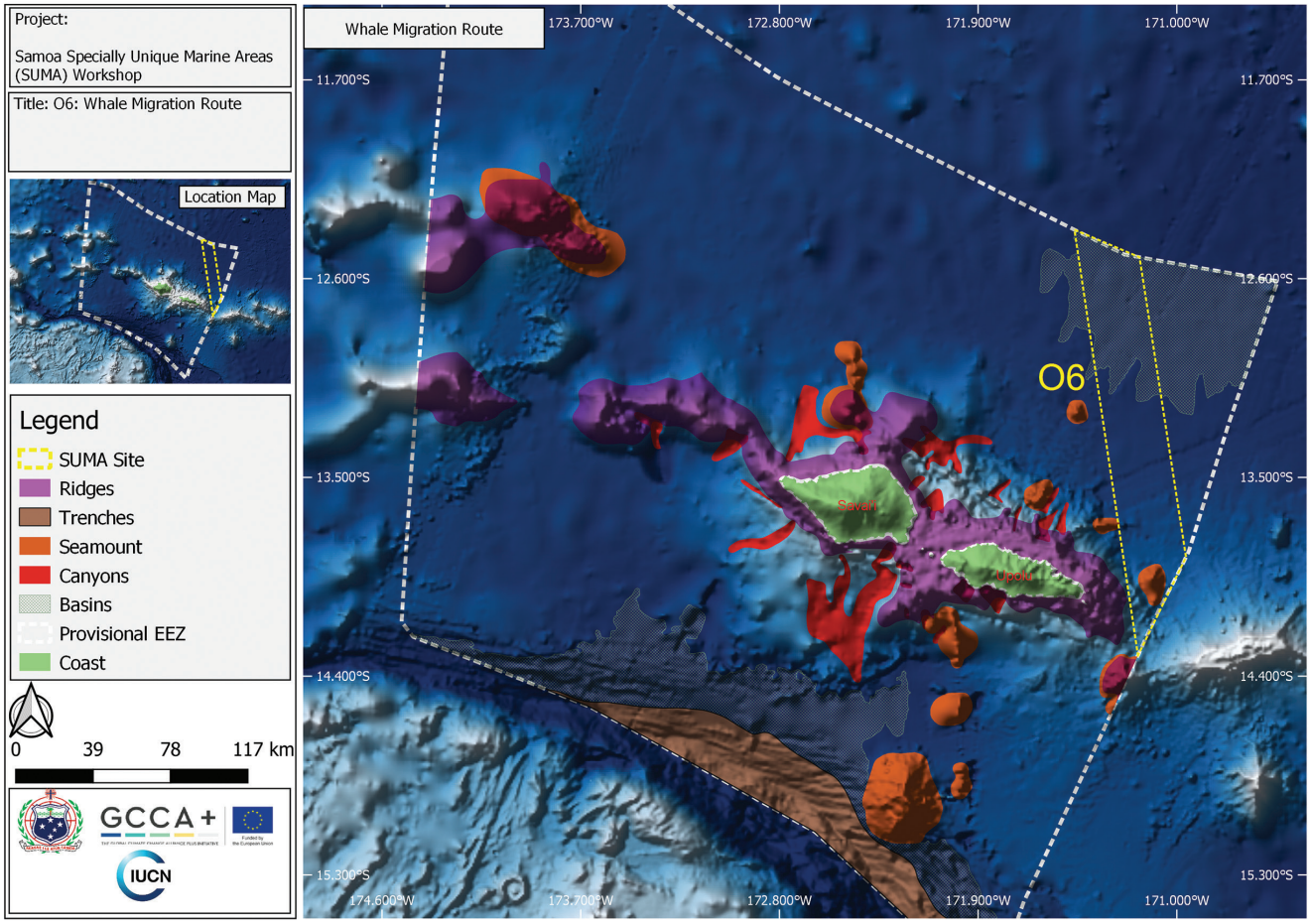
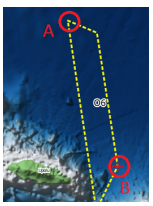


Table 7. Site O 6: Whale Migration Route

Geographic Cluster	Site Name	Site Code	Overall Score
Offshore special, unique site	Whale Migration Route	O6	7

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	O6 A	-12.3786789	-171.4634871
	O6 B	-13.86109856	-170.9579448

Geographic description (score = 1)

This SUMA is a swath of ocean that crosses the eastern portion of Samoa's EEZ. The area is almost 200 km long and approximately 35 km wide.

Justification (score = 1.5)

Workshop participants selected this locale because humpback whales, and potentially other marine mammals, use this area for their annual migrations. This SUMA contains one seamount of Group 4 morphology (small with deep peak; most common type) (GRID-Arendal, 2020). Modelling found that the northern portion of the SUMA lies in waters with very high upwelling frequency (> 3.78%), indicating high primary productivity that favours aggregations of marine life (CMEMS, 2015a). The southernmost portion of the SUMA lies in an area with high (20.6-21.8 %) downwelling eddy frequency, also indicating high primary productivity (CMEMS, 2015b). These characteristics suggest a favourable environment for marine mammals.

Humpback whales occur globally as a series of geographically and genetically distinct populations that migrate annually between Antarctic feeding grounds and low-latitude breeding areas. The poleward summer migration of the Oceania population of humpback whales begins in waters that include this SUMA (Robbins *et al.*, 2011). The island of Tutuila in American Samoa is a known breeding area for humpback whales, and high habitat suitability is also expected around Savai'i and Upolu Islands (Derville *et al.*, 2018).

Two tagged humpback whales near Tutuila, close to the boundary between Samoa and American Samoa, have undertaken the longest-known mammalian migration on Earth. The round-trip journey, between Samoan waters and feeding grounds off the Antarctic Peninsula, consists of 18,840 km (CBD, 2014; Robbins *et al.*, 2011). As well as migrating between Samoan and Antarctic waters, individuals may also move between Samoa, Tonga, the Cook Islands and French Polynesia (Steel *et al.*, 2018).

The breeding subpopulation of Oceania, which includes at least the southernmost portion of this SUMA near Tutuila Island, is listed as Endangered, and has been recovering more slowly than other populations (Constantine *et al.*, 2012). Research into habitat partitioning suggests that this SUMA may be utilised both for migratory movements and for adult groups (rather than mothers with calves), especially males engaged in acoustic breeding displays (Lindsay *et al.*, 2016).

Photographs of the underside of the tail (fluke) and dorsal fins of humpback whales are regularly catalogued to monitor the movement patterns and abundance of these whales in Samoa during the months of August – November (MNRE, 2013; Sesega, 2014). Based on this photo catalogue, a total of 65 unique animals have been documented over 9 years of surveying, signifying that the population of humpback whales in Samoa is still considered low and vulnerable (MNRE, 2013). The MNRE has also collected genetic samples for DNA testing that could shed light on whether locally observed individuals are genetically linked to other mammals elsewhere in the region, or if these are genetically isolated and unique to Samoa (MNRE, 2013).

Overall, at least twelve species of cetaceans are known or likely to be present in Samoan waters (Table 8), all of which are widely distributed in the South Pacific (MNRE, 2013). The MNRE documents and collects dorsal fin photographs of spinner dolphins, rough-toothed dolphins and short-finned pilot whales for individual identification to determine patterns of residency and the abundance of these dolphin populations in Samoa (MNRE, 2013). Most of the available surveys were conducted around the main islands of Savai'i and Upolu, and do not show the presence or abundance of marine mammals in this SUMA. Rough-toothed dolphins, in particular, were shown to have high site fidelity to individual islands, and are unlikely to venture into deep waters (Albertson *et al.*, 2017). One additional species, the Antarctic blue whale, may be present in Samoan waters as it has been detected in the Lau Basin and in the northern Tonga Trench within or near Site O 1: Southern Trench (Balcazar *et al.*, 2017).

An area surrounding the main islands, measuring 12,548 km^2 and extending into the southern portion of this SUMA, has been identified as an "Important Marine Mammal Area", or IMMA (Marine Mammal Protected Areas Taskforce, 2020). The criteria that led to the inclusion of this area include the abundance of humpback whales, spinner dolphins and rough-toothed dolphins, and the overall diversity of marine mammals, including the dwarf sperm whale *Kogia sima*, Blainville's beaked whale *Mesoplodon densirostris*, Cuvier's beaked whale *Ziphius cavirostris*, short-finned pilot whale *Globicephala macrorhynchus*, false killer whale *Pseudorca crassidens*, pantropical spotted dolphin *Stenella attenuata*, sperm whale *Physeter macrocephalus* and bottlenose

dolphin *Tursiops truncatus* (Marine Mammal Protected Areas Taskforce, 2020). A 2010 survey of cetaceans throughout Samoan waters (but tending to remain close to the islands) recorded 31 sightings of cetaceans, with positive identifications of 14 humpback whales, 13 spinner dolphins and lower incidences of rough-toothed dolphins and Blainville's beaked whales (Ward *et al.*, 2010).

Table 8.Whales and dolphins in Samoa's waters. *From MNRE (2013) and DEWHA (2009).*

Species name	Common name	Presence	IUCN Assessment	
			Abundance	Conservation Status
Megaptera novaeangliae	Humpback whale	Present	Low	Endangered*
Physeter macrocephalus	Sperm whale	Present	Low	Vulnerable
Balaenoptera acutorostrata	Minke whale	Present	Low	Vulnerable
Kogia sima	Dwarf sperm whale	Present	Not listed	Data deficient
Peponocephala electra	Melon-headed whale	Present	Not listed	Least concern
Tursiops truncatus	Bottlenose dolphin	Present	Not known	Least concern
Steno bredanensis	Rough-toothed dolphin	Present	Not listed	Least concern
Globicephala macrorhynchus	Short-finned pilot whale	Present	Low	Data deficient
Ziphius cavirostris	Cuvier's beaked whale	Present	Not listed	Least concern
Mesoplodon densirostris	Blainville's beaked whale	Present	Not listed	Data deficient
Pseudorca crassidens	False killer whale	Present	Low	Near threatened
Stenella longirostris	Spinner dolphin	Present	High	Least concern
Balaenoptera edeni	Bryde's whale	Likely	Low	Least concern
Orcinus orca	Killer whale	Likely	Low	Data deficient
Stenella attenuata	Pantropical spotted dolphin	Likely	Not known	Least concern
Stenella coeruleoalba	Striped dolphin	Likely	Not listed	Least concern
Grampus griseus	Risso's dolphin	Likely	Not listed	Least concern
Lagenodelphis hosei	Fraser's dolphin	Likely	Not listed	Least concern
Balaenoptera musculus ssp. intermedia	Antarctic blue whale	Possible	Not listed	Critically endangered

*Oceania subpopulation

Type and number of sources (score = 2.5)

Information to characterise this SUMA was obtained from two maps, one website, three reports and one peer-reviewed paper, which modelled the habitat suitability of the southern portion of the SUMA for humpback whales. Further information describing marine mammal presence and movements in Samoa was obtained from seven peer-reviewed papers and two reports.

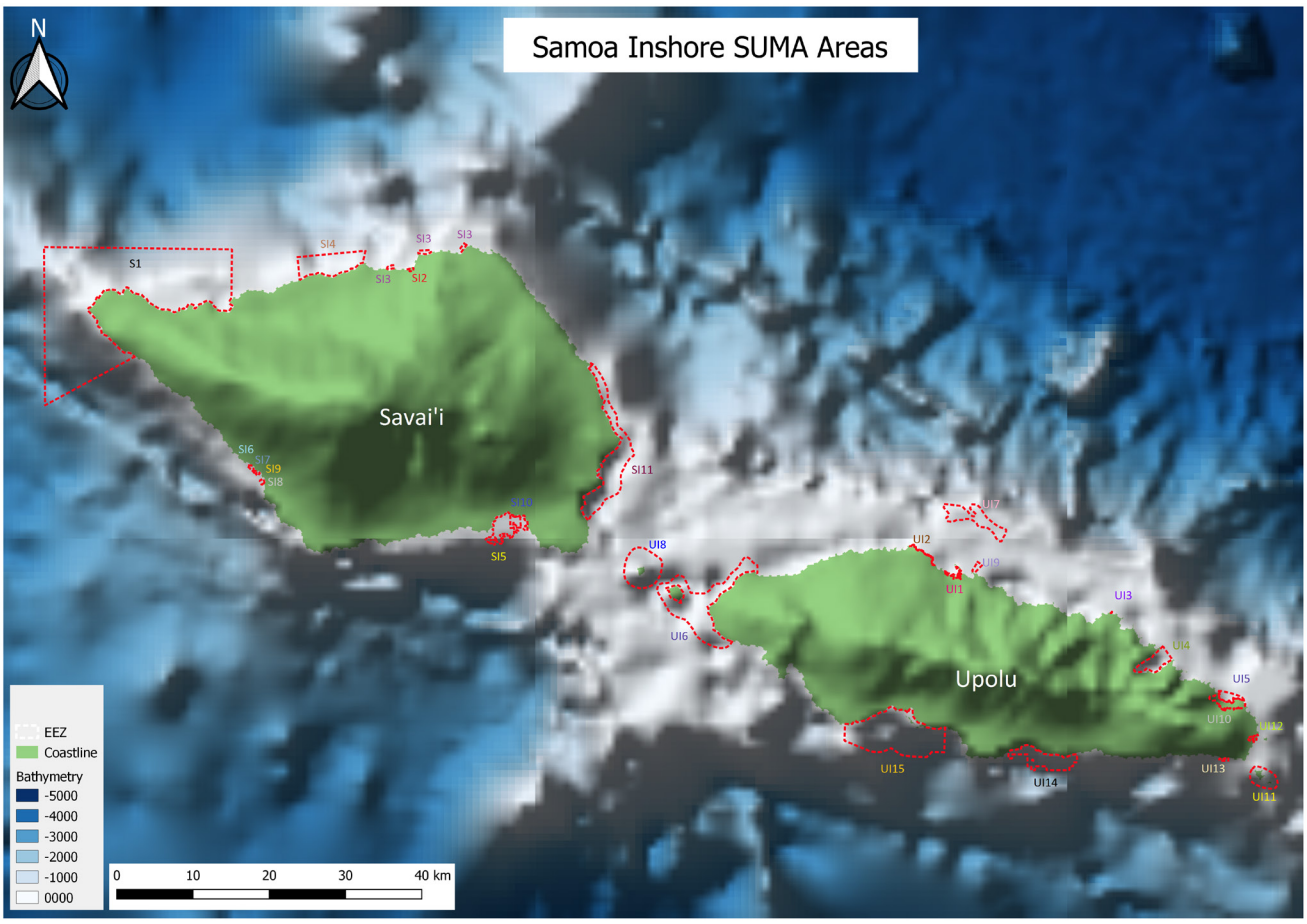
Obligations (score = 2)

The Marine Wildlife Protection Regulations 2009 recognises the protection of whales and dolphins as one of its main priorities. The marine mammals frequenting Samoan waters are on the IUCN Red List of Threatened Species, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The Oceania population of humpback whales in particular is listed as endangered.

6.2 Inshore biophysically special and/or unique marine sites

All the inshore SUMAs in Samoa are depicted in the Figure 8.

Figure 8. Overview of the inshore SUMA sites



UPOLU
Island

Site UI 1: *Vaiusu Bay mangroves*

A mangrove is a woody tree or shrub that lives along sheltered tropical or subtropical coastlines. “Mangrove” can also be used as a term that refers to an entire community, where the trees and shrubs create habitat for other plants and animals, and the branching root system underwater hosts fish, especially juveniles (Smithsonian, 2018).

Figure 9. Site UI 1: Vaiusu Bay mangroves

Table 9. Site UI 1: Vaiusu Bay mangroves

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Upolu	Vaiusu Bay mangroves	UI1	10

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	UI1 A	-13.82829352	-171.7914506
	UI1 B	-13.8238695	-171.7745457

Geographic description (score = 2.5)

The mangrove forest encompassed within this SUMA extends along the coast to the west of Apia on Upolu Island. The SUMA begins just south of Mulinu'u on the western side of the headland and extends around Vaiusu bay to Vaigaga for a total distance of approximately 3 km. Its southern edge is at Pesega and Fugalei.

Justification (score = 1.5)

The Vaiusu Bay mangrove stand, one of the two main mangrove stands in Samoa, is considered the largest mangrove area in eastern Polynesia (Iakopo, 2006; IUCN, 2014; MNRE, 2013; Ropeti and Foliga, 2008; Skelton *et al.*, 2000; Zann, 1999). Its proximity to Samoa's capital city of Apia increases its value and vulnerability. Mangroves contribute to essential ecosystem goods and services which are especially important to the surrounding population. These include their high productivity as well as their role as nursery grounds and habitat for species important to fisheries (Ropeti and Foliga, 2008).

Additionally, mangroves provide a buffer between land and sea that mitigates erosion, marine pollution and the impact of spring tides and storm surges (MNRE, 2001; Sesega, 2014). However, they are more readily subject to overexploitation, habitat destruction, pollution and degradation due to their proximity to the city (Iakopo, 2006; Zann, 1999). Unfortunately, much of the information specific to this SUMA emphasizes the human impacts on the mangrove ecosystem, including the contamination of shellfish in the bay (MNRE, 2015), a rubbish dump in Vaitoloa (MNRE, 2001), sand dredging on the Mulinu'u Peninsula (Iakopo, 2006), and numerous changes in land use documented by Boon (2001).

Samoa hosts three species of mangroves (Rhizophora samoensis, Bruguiera gymnorhyza and Xylocarpus granatum), and 78 mangrove sites were recorded by Samoa's Mangrove Ecosystems for Climate Change Adaptation and Livelihoods (MESCAL) Project team in 2013 (IUCN, 2014). However, a reduction from 1,250 ha estimated in 1991 (MNRE, 2013) to 752 ha in 2009 (Ellison, 2009) shows a downward trend in mangrove cover.

Three mangrove communities are recognised in Samoa: mangrove forest consisting mostly of B. gymnorrhiza, mangrove scrub (rarely more than 5 m high) comprising a mixture of both R. samoensis and B. gymnorrhiza; and a community that favours X. granatum (Skelton *et al.*, 2000). As none of the typically landward mangrove species are present in Samoa, much of the forest is occupied by Bruguiera (Ellison, 2009); together with R. samoensis, this species is well-represented in Samoa (Sesega, 2014). The species X. granatum is found in only one location, 2 acres in size, in Siutu Salailua in Savai'i (MNRE, 2013), and is considered a candidate for specific protection measures (MNRE, 2015, 2001). The R. samoensis species dominates the mangroves in the Vaiusu Bay area SUMA (Saifaleupolu, 2015).

The dense root systems of mangrove forests trap sediments from rivers and reduce sedimentation and turbidity in the adjacent coastal waters, protecting coral reefs and seagrass beds. They stabilize the coastline and prevent erosion from waves and storms. In areas where mangroves have been cleared, coastal damage from hurricanes and typhoons is much more severe. Tropical mangrove trees also excel at storing carbon dioxide; they are considered the most carbon-dense ecosystem in the world, with most of the carbon underground (Sanderman *et al.*, 2018). Modeled above-ground carbon biomass for Samoa is between 280 and 320 Mg per ha, which is regarded as high (Hutchison *et al.*, 2013). The restoration of degraded mangrove forests is considered a key tool for adaptation to climate change impacts such as sea level rise (Chong, 2014; MNRE, 2015).

Samoa's mangrove forests are home to a large variety of fish, eel, shellfish, and other invertebrate species that form an essential source of food for the country's coastal communities (IUCN, 2014). Mangrove crabs (*Scylla* sp.) and ark shells (*Andara* spp.) comprise a high proportion of Samoa's invertebrate fisheries for example (Table 10), comprise (Skelton *et al.*, 2000). Mangroves also serve as nurseries for many fish species, including coral reef fish (MNRE, 2013), and provide habitat for birds and flying foxes, as well as hawksbill turtles and 26 species of epiphytic plants (Ropeti and Foliga, 2008). Within the two large mangrove areas of Vaiusu Bay and Sataoa-Saanapu of Safata Bay, thirty-five species of fish from twenty-two families have been recorded and a high abundance of the mullet *Liza melinoptera* (Boon, 2001).

Table 10. Common species associated with Samoa's mangroves, from Iakopo (2006), Boon (2001) and Saifaleupolu (2015). The status of each species on the IUCN Red List of Threatened Species and the listing in the CMS Appendices is included. LC: Least Concern, DD: Data Deficient, NT: Near Threatened.

Taxonomic group	Species name	Common name	Samoan name	IUCN	CMS
BIRDS	*Egretta sacra*	Pacific reef heron	Matu'u	LC	
	Aplonis atrofusca	Samoan starling	Fuīa	LC	
	Anas superciliosa	Pacific black duck	Toloa	LC	II
	Foulehaio carunculatus	Wattled honeyeater	'Iāo	LC	
	Pluvialis dominica	Lesser golden plover	Tuli	LC	II
	Ptilinopus porphyraceus	Tongan fruit dove	Manutagi	LC	
	Rhipidura nebulosa	Samoan fantail	Se'u	LC	
	Lalage maculosa	Polynesian triller	Miti-tai	LC	
	Myiagra albiventris	Samoan flycatcher	Tolai	NT	
	Myzomela cardinalis	Cardinal honeyeater	Segasegamau'u	LC	
INVERTEBRATES	*Scylla serrata*	Mangrove crab	Pa'alimago		
	Scylla paramamosian	Green mangrove crab	Pa'alimago		
	Uca spp.	Fiddler crabs	Pa'a		
	Cardisoma carnifex	Land crab	Tupa		
	Sesarma erythrodactyla	Red claw mangrove crab	U'a		
	Pinctada spp.	Oysters	Tifa		
	Crassostrea mordax	Mangrove oyster	Tio		
	Saccostrea glomerata	Rock oyster	Tio		
	Gafrarium tumidum	Venus shell	Pipi		
	Veneridae	Venus shells	Tugane		
	Andara spp.	Ark shells	Pae		
	Vasticardium spp.	Coconut scraper cockles	Matatuai/Asi		
	Cardiidae	Sand cockles	Tugane		
	Penaeidae	Prawns	Ula		
	Siphonopoma australe	Peanut worm	Ipo		
FISH	*Uropterygius concolor*	Brown moray eel	Pusi gatala	LC	
	Cirrhimuraena tapeinoptera	Moray eel	Gatauli		
	Muraenichthys macrostomus	Worm eel	Gatamea		
	Yirrkala lumbricoides	Earthworm snake-eel			
	Anguilla marmorata	Marbled eel	Tuna	LC	
	Chanos chanos	Milkfish	Ava	LC	
	Zenarchopterus dispar	Feathered river-garfish	Ise	LC	
	Kuhlia marginata	Silver flagtail	Lalele	LC	
	Kuhlia rupestris	Jungle perch	Inato	LC	
	Terapon jarbua	Tiger perch	Ava'ava	LC	
	Ostorhinchus lateralis	Humpback cardinalfish	Fo	LC	
	Alectis ciliaris	African pompano	Lupo	LC	

Taxonomic group	Species name	Common name	Samoan name	IUCN	CMS
FISH	*Caranx ignobilis*	Giant trevally	Malauli	LC	
	Caranx melampygus	Bluefin trevally	Malauli apamoana	LC	
	Caranx papuensis	Brassy trevally	Malauli sinasama	LC	
	Leiognathus equulus	Common ponyfish	Mumu	LC	
	Lutjanus argentimaculatus	Mangrove red snapper	Palu	LC	
	Lutjanus fulvus	Blacktail snapper	Tamala	LC	
	Lethrinus harak	Thumbprint emperor	Filoa-vai	LC	
	Lethrinus variegatus	Slender emperor	Mataeleele	LC	
	Gerres macrosoma	Slender silver-biddy	Matu	LC	
	Gerres oblongus	Slender silver-biddy	Matu-loa	LC	
	Mulloidichthys flavolineatus	Yellowstripe goatfish	Vete	LC	
	Parupeneus indicus	Indian goatfish	Tauleia	LC	
	Upeneus vittatus	Striped goatfish	Ula'oa	LC	
	Monodactylus argenteus	Silver moony	Vavale	LC	
	Poecilia mexicana	Shortfin molly	Fo-vai	LC	
	Abudefduf septemfasciatus	Banded sergeant	Mutu	LC	
	Chrysiptera biocellata	Twinspot damselfish	Tu'u'u		
	Chelon melinopterus	Otomebora mullet	Poi/Aua/Anae	LC	
	Osteomugil engeli	Kanda	Anae	LC	
	Crenimugil seheli	Bluespot mullet	Anae		
	Ophiocara porocephala	Spangled gudgeon		LC	
	Psammogobius biocellatus	Sleepy goby	Mano'o	LC	
	Oxyurichthys tentacularis	Goby	Mano'o	DD	
	Periophthalmus cantonensis	New Guinea mudskipper	Mano'o	LC	
	Taenioides jacksoni	Bearded eelgoby		NT	
	Arothron manilensis	Narrow-lined puffer	Sue	LC	
	Acanthurus xanthopterus	Yellowfin surgeonfish	Palagi	LC	
	Acanthurus lineatus	Lined surgeonfish	Alogo	LC	
	Ctenochaetus striatus	Lined bristletooth	Pone	LC	
	Oreochromis spp.	Tilapia	Tilapia		
	Epinephelus maculatus	Highfin grouper	Gatala	LC	
	Platybelone argalus platyura	Keeled needlefish	Īse	LC	
	Siganus fuscescens	Mottled spinefoot	Lo		
PLANTS	*Brugueira gymnorrhyza*	Mangrove	Togo	LC	
	Xylocarpus granatum	Mangrove	Le'ile'i	LC	
	Rhizophora samoensis	Red mangrove	Togo	NT	
	Ficus tinctoria	Dyer's fig	Mati	LC	
	Hernandia nymphaeifolia	Chinese lantern	Pu'a		

Taxonomic group	Species name	Common name	Samoan name	IUCN	CMS
PLANTS	*Erythrina variegata*	Indian coral tree	Gatae	LC	
	Colubrina asiatica	Asian snakewood	Fisoa		
	Barringtonia asiatica	Fish poison tree	Futu	LC	
	Clerodendrum inerme	Clerodenrum	Aloalo tai		
	Asplenium nidus	Bird's nest fern	Laugapapa		
	Phymatosorus grossus	Wart fern	Lauauta		
	Pyrrosia lanceolata	One leaf fern	Lau tasi		
	Vigna marina	Beach pea	Fue sina	LC	
	Cyathea spp.	Tree fern	Olioli		
	Davallia solida	Giant hare's foot fern	Laugasese		
	Hibiscus tiliaceus	Beach hibiscus	Fau	LC	
	Hoya australis	Wax plant	Lau mafiafia		
	Pandanus tectorius	Screw pine	Lau fala	LC	
	Paspalum conjugatum	T-grass	Vao lima	LC	
	Morinda citrifolia	Indian mulberry	Nonu		
	Calophyllum inophyllum	Alexandrian laurel	Fetau	LC	
	Dysoxylum spp.	Dysoxylum	Maota mamala		
	Bulbophyllum sp.	Bulbophyllum	Lili vao		
	Erianthus maximus	Erianthus	Fiso		
	Cananga odorata	Ylang-ylang	Mosooi		
	Histiopteris incisa	Batwing fern	Fiso vai		
	Davallia heterophylla	Haresfoot fern	Vao sosolo		
	Bulbophyllum apodum	Fern	Vao sosolo i le laau		
	Hymenophyllum imbricatum	Filmy fern	Vao sosolo i le papa		
	Inocarpus fagifer	Polynesian chestnut	Ifi	LC	
	Lycopodium phlegmaria	Tassel fern	Laau fai pale		
	Ophioglossum pendulum	Ribbon fern	Laugapapa		
	Psilotum complanatum	Flat fork fern			
	Taeniophyllum fasciola	Leafless orchid			
	Davallia fejeensis	Rabbit foot fern			
	Drynaria rigidula	Oak leaf fern			
	Earina sp.	Easter orchid			
	Asplenium polyodon	Sickle spleenwort			
	Acrostichum aureum	Swamp fern	Saato	LC	
	Terminalia catappa	Beach almond	Talie	LC	
	Thespesia populnea	Portia tree	Milo	LC	
ALGAE	*Ulva clathrata*	Sea lettuce			
	Chaetomorpha brachygona	Green alga			

Taxonomic group	Species name	Common name	Samoan name	IUCN	CMS
ALGAE	*Chaetomorpha minima*	Green alga			
	Cladophora liebertruthii	Green alga			
	Cladophora sp.	Green alga			
	Rhizoclonium africanum	Green alga			
	Boodlea composita	Green alga			
	Cladophoropsis carolinensis	Green alga			
	Boodleopsis carolinensis	Green alga			
	Caulacanthus ustulatus	Red alga			
	Gelidium pusillum	Red alga			
	Gelidiella pannosa	Red alga			
	Ceramium flaccidum	Red alga			
	Ceramium upolense	Red alga			
	Caloglossa leprieurii	Red alga			
	Bostrychia tenella	Red alga			
	Murrayella periclados	Red alga			
	Polysiphonia howe	Red alga			
	Calothrix confervicola	Blue-green alga			
	Calothrix crustacea	Blue-green alga			
	Lyngbya sp.	Blue-green alga			
	Caloglossa adhaerens	Blue-green alga			

Type and number of sources (score = 3)

The mangroves in this SUMA were mentioned in six reports and three peer-reviewed papers; however, descriptions of their special, unique values are scarce and overshadowed with stories of their degradation. Information about the value of mangroves in Samoa more generally was found in four reports and two peer-reviewed papers, and supplemented with two peer-reviewed papers about the general role of mangroves in carbon capture.

Obligations (score = 3)

Mangroves are not protected under any specific legislation in Samoa, but the National Adaptation Programme for Action (NAPA) lists the reforestation, rehabilitation and sustainable management of forests as its second-ranked priority project. which includes mangrove forests. Conservation and the sustainable use of mangrove areas is also reflected in the overall vision of the Samoa National Biodiversity Strategy & Action Plan 2015-2020. Other legislation, such as the Fisheries Act 1988, the Forestry Management Act 2011 and the Water Management Regulations 1992 also assist in the management of wetlands (which includes mangroves) and assessments of wetland importance. The majority of wetlands in Samoa are administered by village councils and individuals (IUCN, 2014); some villages have developed village rules (and related infringements) for mangrove area management and control that are sometimes further translated into bylaws recognized nationally at the statutory courts of law (Siamomua-Momoemausu, 2013). Protection measures are underway, such as the Mulinu'u Mangrove Reserve mentioned in the CBD report (Sesega, 2014). Samoa is a signatory to the Ramsar convention, and some species that spend all or part of their life cycle in mangrove ecosystems are on the IUCN Red List of Threatened Species, the Convention on Migratory Species (CMS), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and protected under the The Marine Wildlife Protection Regulations 2009.

Site UI 2: *Toamua-Fale'ula mangrove area*

Figure 10. Site UI 2: Toamua-Fale'ula mangrove area

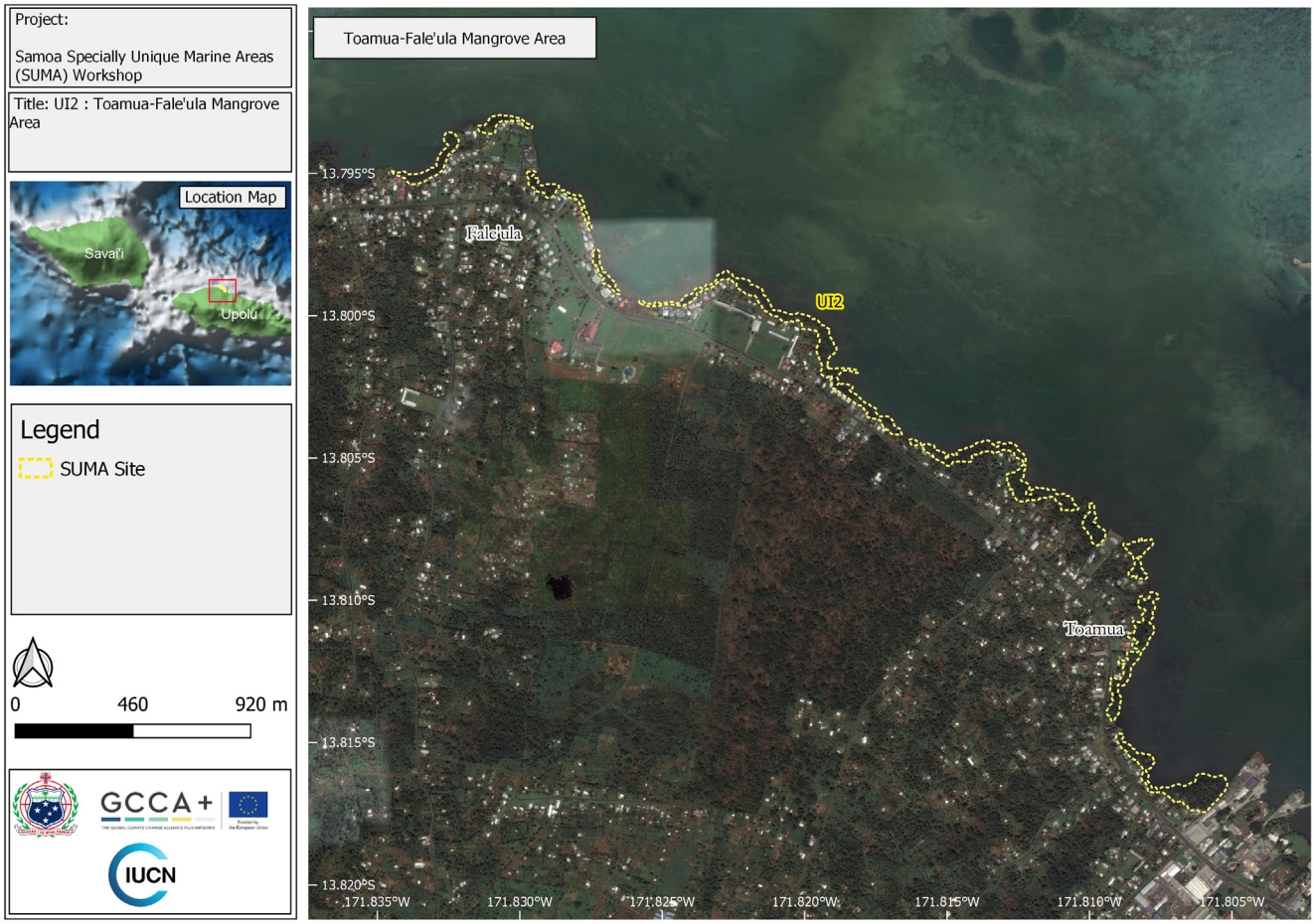


Table 11. Site UI 2: Toamua-Fale'ula mangrove area

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Upolu	Toamua-Fale'ula mangrove area	UI2	7.5

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	UI2 A	-13.79491155	-171.8344879
	UI2 B	-13.80803022	-171.8077682
	UI2 C	-13.81622031	-171.8052535

Geographic description (score = 1)

This SUMA is a narrow strip of mangroves lining the northern coast of Upolu from Toamua to Fale'ula, for approximately 3.7 km. The mangroves are fragmented and interspersed with villages and cultivated land.

Justification (score = 1.5)

The mangroves in this SUMA represent an extension of those in Site UI 1: Vaiusu Bay mangroves, albeit forming a narrower strip, and are also dominated by *Rhizophora samoensis* (Saifaleupolu, 2015). There are a few individual *Brugueira gymnorrhiza*, as the coastal geomorphology in this area favours the establishment and survival of species adapted to seaward conditions. A survey in 2015 discovered the presence of *Xylocarpus granatum*, which was previously thought to be absent from this area (Saifaleupolu, 2015). However, it is estimated that 80% of the mangroves in this SUMA have been destroyed, important species such as mangrove crabs and venus shells have declined, and the area is in urgent need of rehabilitation. The survey listed 40 species of plants, 15 fish, 11 birds and six invertebrate species (contained within Table 10). Further information about the value and importance of mangroves globally, and in Samoa, is presented in Site UI 1: Vaiusu Bay mangroves, and also applies to this SUMA.

Fale'ula is also the site of a community-based fish reserve on the reef off the northern end of the SUMA. This is a useful safeguard to protect species that frequent the mangroves. For information on Samoa's marine protected areas and community fish reserves, see Site UI 3: Lufilufi/Faleapuna Community-Based Fish Reserve. Information synthesised there is also relevant for this SUMA.

Type and number of sources (score = 2)

The general sources used to describe mangroves for Site UI 1: Vaiusu Bay mangroves and Site UI 3: Lufilufi/Faleapuna Community-Based Fish Reserve are also relevant here. Additionally, one report described surveys conducted in the mangroves of this SUMA.

Obligations (score = 3)

Mangroves are not protected under any specific legislation in Samoa, but the National Adaptation Programme for Action (NAPA) lists as its second-ranked priority project the reforestation, rehabilitation, and sustainable management of forests, which includes mangrove forests. Conservation and the sustainable use of mangrove areas is also reflected in the overall vision of Samoa's National Biodiversity Strategy & Action Plan 2015-2020. Other legislation, such as the Fisheries Act 1988, the Forestry Management Act 2011 and the Water Management Regulations 1992 also assist in the management of wetlands (which includes mangroves) and assessments of wetland importance.

The majority of wetlands in Samoa are administered by village councils (fono) and individuals (IUCN, 2014); some villages have developed village rules (and related infringements) for mangrove area management and control. These rules are sometimes further translated into by-laws which are recognized nationally at the statutory courts of law (Siamomua-Momoemausu, 2013). The village fisheries by-laws provide for the conservation and management of the local environment, and for the management of community-based fish reserves. Protection measures are underway, such as the Mulinu'u Mangrove Reserve mentioned in the CBD report (Sesega, 2014). Samoa is a signatory to the Ramsar convention, and some species that spend all or part of their life cycle in mangrove ecosystems are on the IUCN Red List of Threatened Species, the Convention on Migratory Species (CMS), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and protected under the The Marine Wildlife Protection Regulations 2009.

Site UI 3: *Lufilufi/Faleapuna Community-Based Fish Reserve*

Figure 11. Site UI 3: Lufilufi/Faleapuna Community-Based Fish Reserve

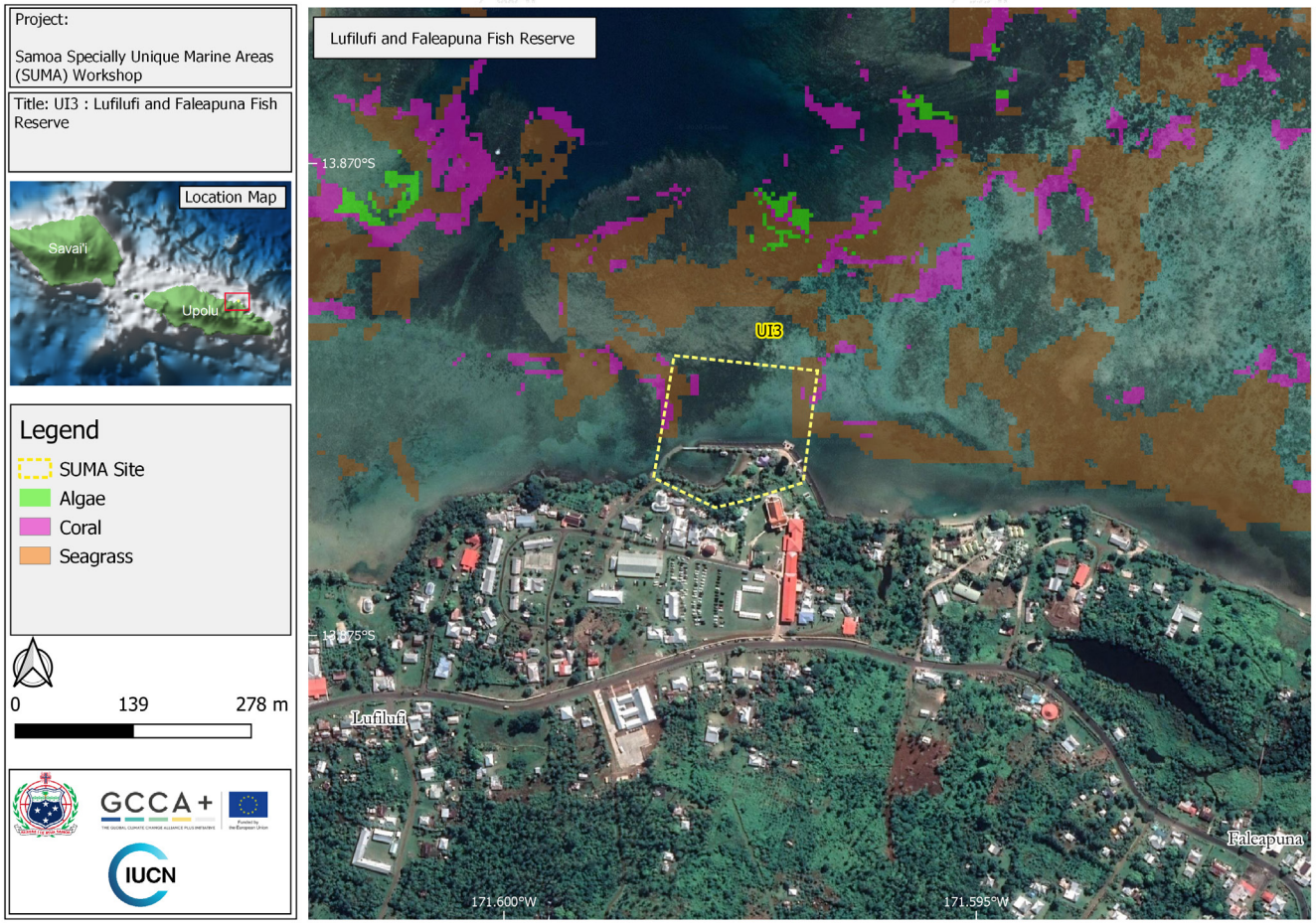


Table 12. Site UI 3: Lufilufi/Faleapuna Community-Based Fish Reserve

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Upolu	Lufilufi/Faleapuna Community-Based Fish Reserve	UI3	9

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	UI3 A	-13.87333093	-171.5984164
	UI3 B	-13.87219667	-171.5966807

Geographic description (score = 2)

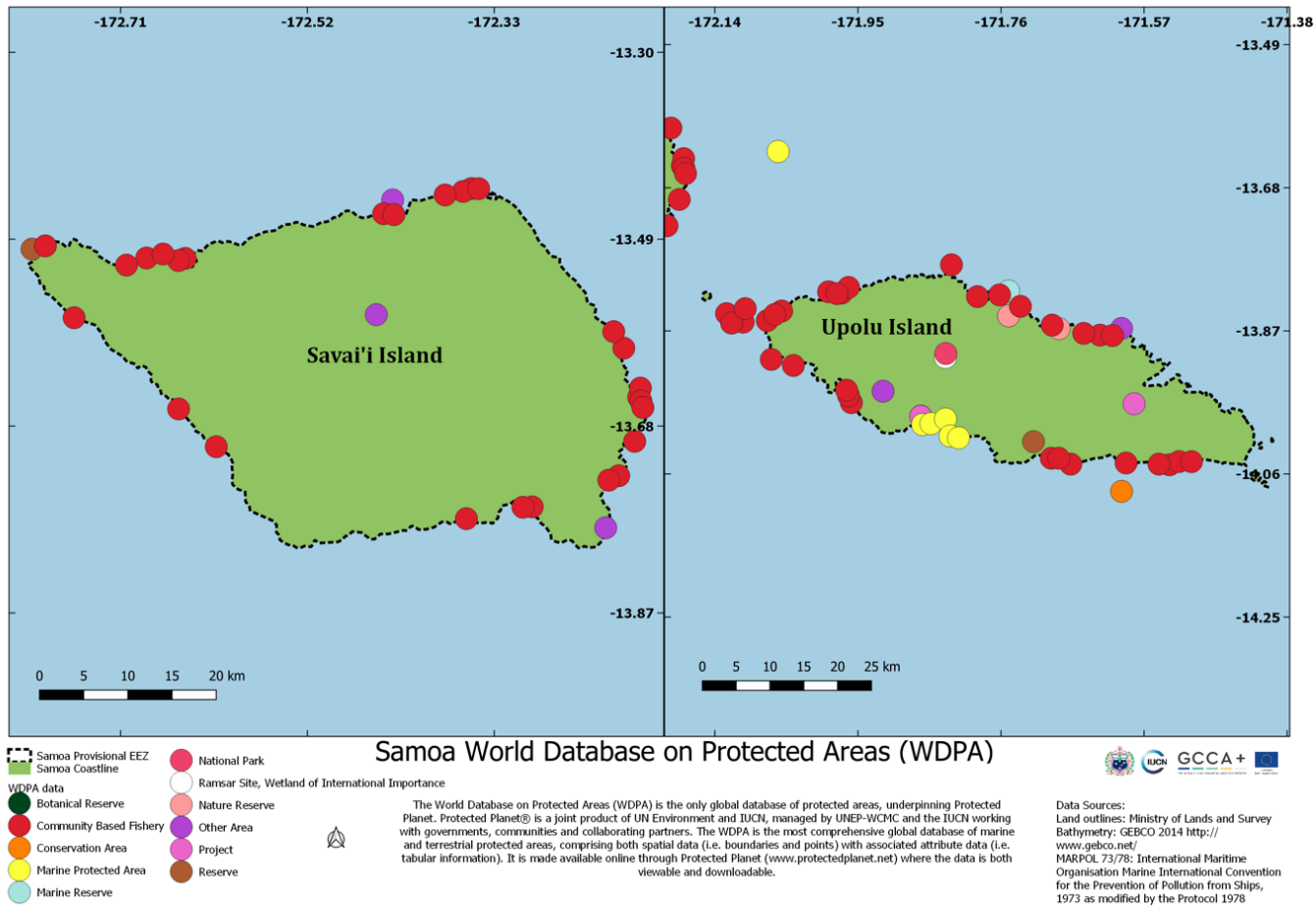
This SUMA contains an area of reef flat seaward of Lufilufi on Upolu Island, specifically the Faleapuna Community-Based Fish Reserve, which measures approximately 0.2 km^2.

Justification (score = 1.5)

This SUMA was selected for its value as a community-based fish reserve, established in 1996, and the high abundance of giant clams found on the reef flat. The management practices specific to this SUMA include fish and mesh size limits, a ban on destructive fishing and rubbish dumping, and crown-of-thorns removal (King and Faasili, 1999). Early coral reef surveys found low coral cover, coral richness and fish biomass, but medium fish richness, at the Faleapuna site (Kendall and Poti, 2011). More recent reef flat surveys to assess the fish reserve reported 24% coral cover dominated by massive, submassive and foliose growth forms, abundant sea cucumbers and a fish assemblage typical of Pacific reef flats (Aiafi, 2017a). On the reef crest further offshore, the most recent survey showed higher macroalgal (27%) than coral (18%) cover (Seinor *et al.*, 2020).

In recognition of the limited success of national-scale fisheries management, the community-based fisheries extension project began in Samoa in 1995, to devolve stewardship over fishing grounds to individual villages (King and Fa'asili, 1999). This recognised the village *fono* (council) as the prime management authority and instigator of change, while still allowing for wider community participation (King and Fa'asili, 1999). Individual villages have their own management plans, including measures such as size and catch limits, gear restrictions and no-take areas. The removal of Crown-of-Thorns starfish (*Acanthaster solandri*) and the restocking of giant clams (*Tridacna derasa*) are also common in fish reserves (King and Fa'asili, 1999);

Figure 12. Locations of all current protected areas in Samoa labelled by type.



a restocking program introduced trochus to the reef in this general area in 2003, and found that relatively high densities were still in place in 2010 (Tiitii and Aiafi, 2016). An estimated 70 community-based fish reserves (Figure 12) are currently active in Samoa (WCMC, 2020), and an estimated 16 km^2 of Samoa's marine areas in 2009 were protected as no-take zones (Govan, 2009).

Samoa's increasing network of protected areas, including community-based conservation areas and fish reserves, as well as nationally managed marine protected areas (MPAs), are important components of promoting the national goal of biodiversity conservation (Sesega, 2014). Locally managed marine areas (LMMAs), as they are known elsewhere, can be highly successful because place-based knowledge gathered over generations informs day-to-day decision-making and extends beyond ecological knowledge. It encompasses language, resource use and management, systems of classification (including biota and biophysical conditions), social interactions, cultural practices and spirituality (Mackey and Claudie, 2015).

In the Pacific, traditional socio-cultural management frameworks are increasingly recognised as a crucial element in ecosystem management and marine spatial planning, especially in the context of adaptation to climate change (Warwick *et al.*, 2017). A desire exists in Samoa to tailor resource management and climate adaptation projects to the country's values and conduct administration through village councils (Matai councils), rather than Western values and institutions (Nalau *et al.*, 2018). The management of fish reserves by communities, who therefore hold a direct interest in their success, generates high compliance levels of fishing bans and a prevalence of lower costs. (King and Fa'asili, 1999).

Communities with locally managed marine areas such as community-based fish reserves regularly report rapid increases of marine resources within closed areas (Govan, 2009). Successfully managed reserves typically host a high abundance of fishes and invertebrates that are ecologically, economically and culturally important. A coral reef survey in Upolu found that the areas of highest coral cover were in protected regions and suggested that local management actions contribute significantly to overall reef health and biodiversity (Ziegler *et al.*, 2018). Evidence for significant fishery benefits such as increased landings or catch per unit effort, is scarcer as it usually takes a number of years of effective management to attain measurable benefits (Russ and Alcala, 2004).

Although the monitoring of community-based fish reserves occurs regularly in Samoa, the varied indicators between observers over time creates difficulties in detecting spatial patterns and temporal trends. Reports were available for 65 reserves; 31 of these captured temporal trends, especially in benthic communities. Trends of increasing coral cover were recorded in 15 reserves; 11 reserves had declines in coral cover and five reserves had fluctuating trends or little change.

The abundance of high-value invertebrates was generally too low to detect trends. The three species which had high-enough mean densities (crown-of-thorns starfish (*A. solandri*), lollyfish (*Holothuria atra*) and greenfish (*Stichopus chloronotus*), were recorded with enough consistency to allow a broad spatial comparison. Although differences were not statistically significant, a general trend existed of higher numbers of these species in reserves on Upolu Island rather than Savai'i (Figure 13). Fish indicators were often not included until the latest surveys. Typically, fish communities tended to become increasingly dominated by small-bodied species over time. Reserves on both islands had similar assemblages at the family level: a high proportion of damselfishes (Pomacentridae), followed by surgeonfishes (Acanthuridae) and butterflyfishes (Chatodontidae), with a slightly lower representation of wrasses (Labridae) and parrotfishes (Labridae: Scarinae; Figure 14). It must be noted that this reflects a subset of species that were specifically chosen as monitoring indicators (Figure 15).

Giant clams (family Tridacnidae) are widely distributed across coral reefs of the Indo-Pacific (Wells, 1997). Ecologically, giant clams are valuable to reef ecosystems by providing food for predators, scavengers and opportunistic feeders; their shells and mantles provide habitat and topographic complexity; they act as reservoirs of symbionts (family Symbiodinianceae) and filter nutrients from the water (Neo *et al.*, 2015). Of the twelve giant clam species that vary in geographic distribution, *Tridacna maxima* has the largest geographic range (bin Othman *et al.*, 2010) and *T. gigas* is currently found only in Australia and the Solomon Islands. Relict populations also remain elsewhere (Wells, 1997).

A number of life history traits render giant clams vulnerable to overexploitation, including late sexual maturity, a sessile adult phase, broadcast spawning and very high mortality during early life stages (Neo *et al.*, 2015). In many Pacific Island countries and territories, giant clams form part of traditional diets and local economies (Gillet and Tauati, 2018). Common regulatory measures in giant clam fisheries

Figure 13. Mean abundance (+/- 1 SE) of three species of invertebrates, with data gleaned from community-based fish reserve assessment reports.

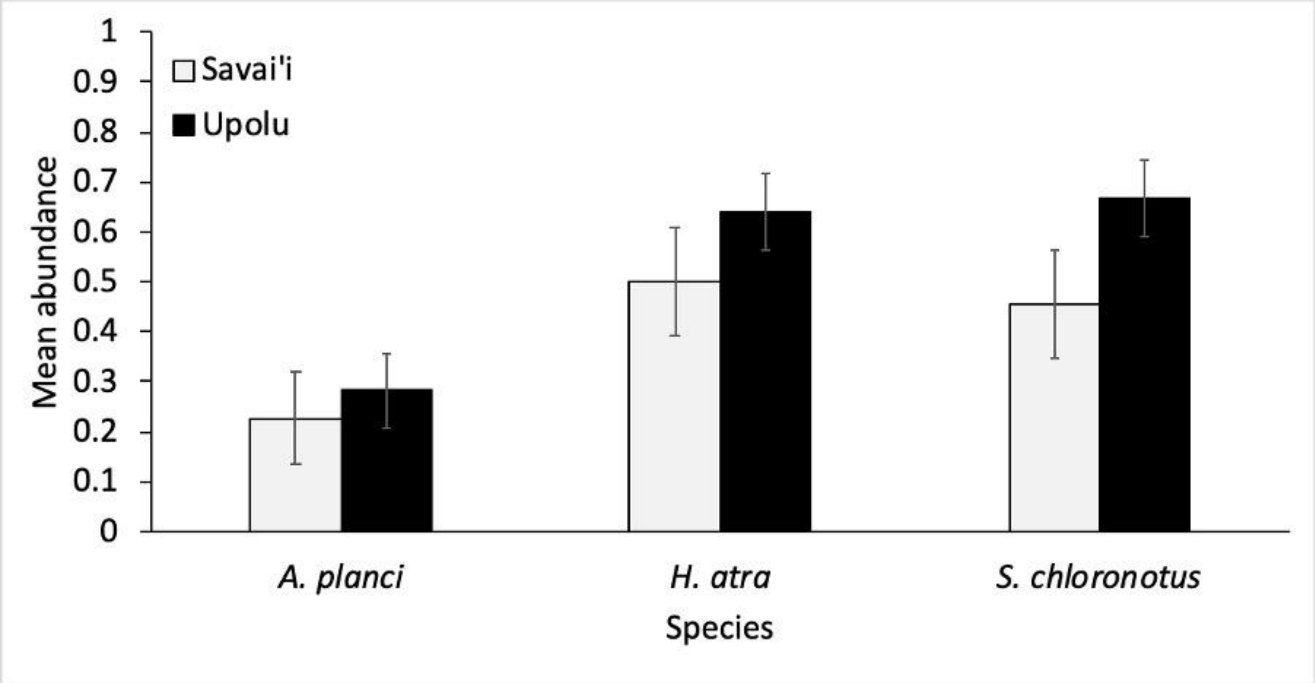


Figure 14. Family composition of reef fish species commonly recorded in community-cased fish reserves on Savai'i and Upolu Island, with data gleaned from assessment reports.

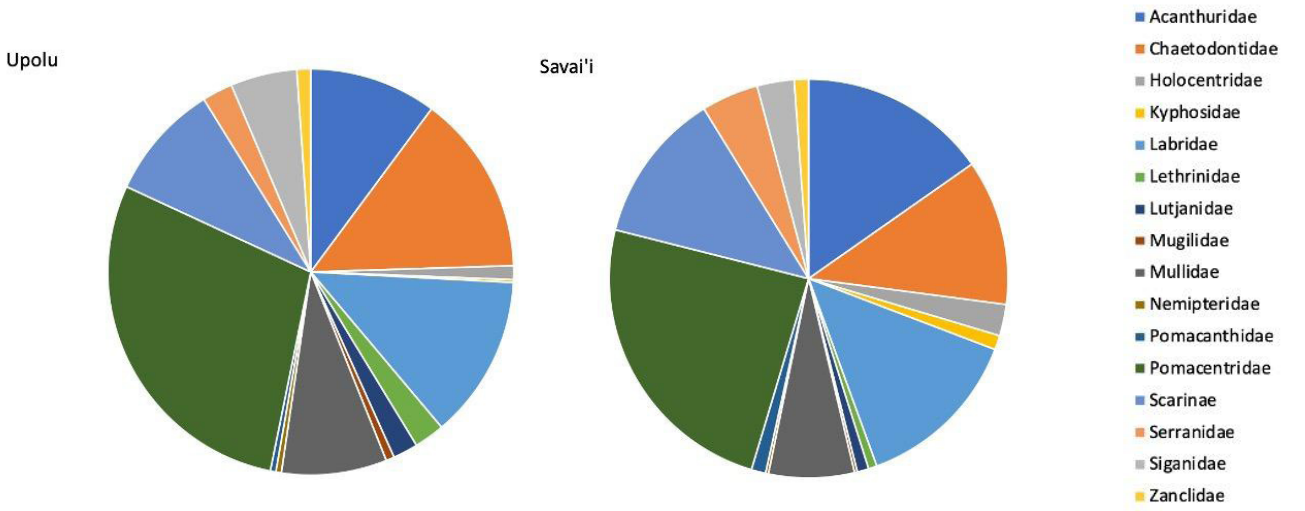
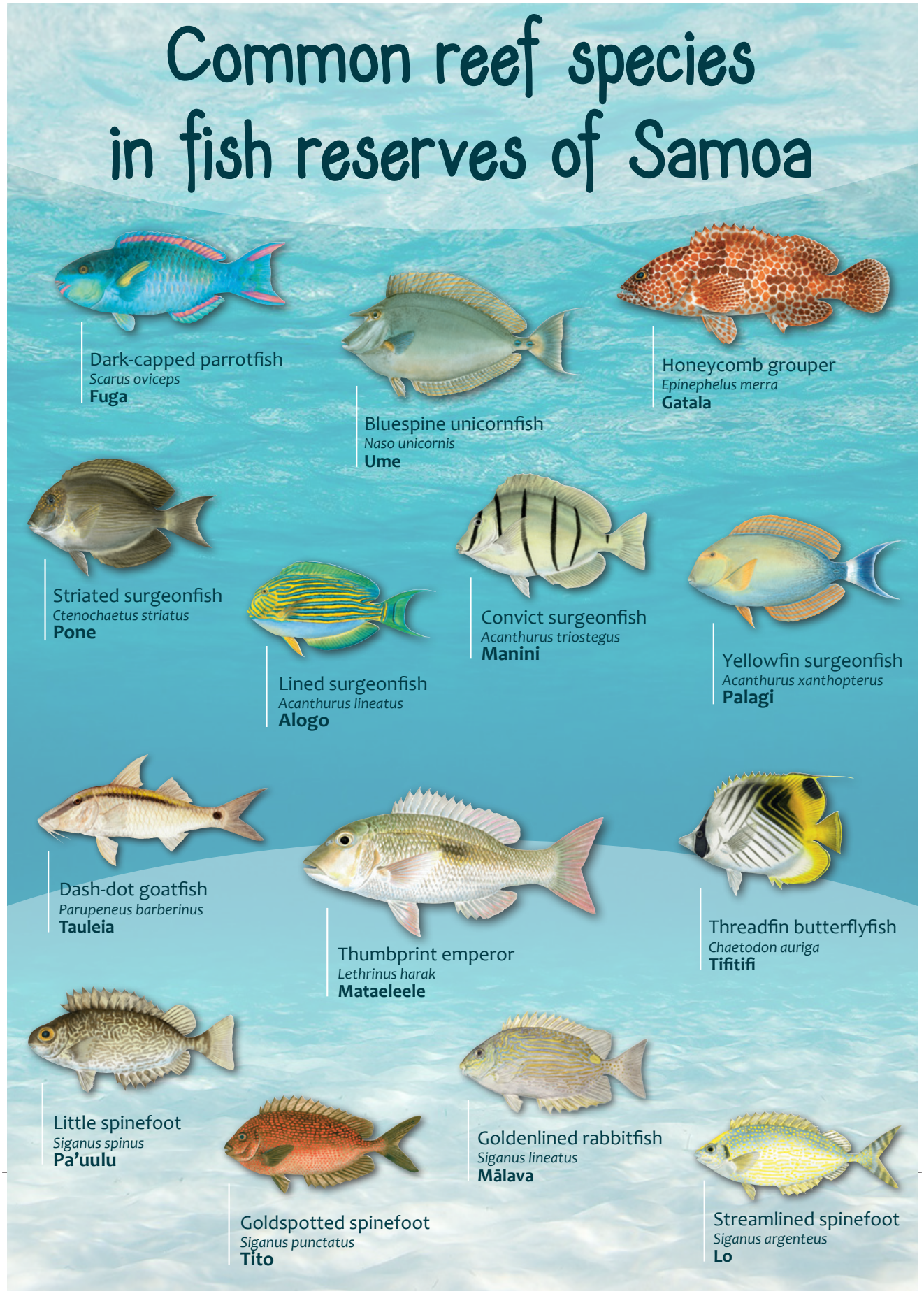


Figure 15. Common fish species preferentially protected by community-based fish reserves in Samoa. Larger populations of these species may be expected in well-protected reserves than in fished areas. These are also the species most commonly selected for monitoring. From SPC (2017).



include minimum legal size limits, daily bag limits or catch quotas, and no-take marine reserves (Gilbert *et al.*, 2005; Gomez and Mingoa-Licuanan, 2006; Teitelbaum and Friedman, 2008).

A recent meta-analysis indicated that populations of *Tridacna maxima* closest to dense human populations were at greatest risk, but reefs near land areas with low human population densities also did not always have high clam densities (Van Wynsberge *et al.*, 2013). Furthermore, giant clam densities can also vary according to broad reef types, with the highest densities found on semi-closed atolls, open atolls and continental reefs (Van Wynsberge *et al.*, 2013). This SUMA, which is in a sheltered environment, might be expected to host naturally low giant clam densities.

Giant clams have been heavily depleted in Samoa, while attempts to breed *Tridacna squamosa* and *T. maxima* have been hampered by the difficulty in finding enough large individuals as broodstock (King and Fa'asili, 1999). A survey of giant clams across a number of islands in Samoa and American Samoa recorded the lowest densities of clams correlating with the highest human population densities, on Upolu Island (Green and Craig, 1999). Large numbers of *T. derasa* were imported from American Samoa and placed in community-based fish reserves for monitoring and caring by communities. Whether any of these were placed within this SUMA is unknown. In Samoa, the restocking of giant clams occurred primarily for conservation, rather than fisheries' reasons (SAPA, 2004). Although in some areas, giant clams comprise 30% of the invertebrate catch (Pinca *et al.*, 2009).

Type and number of sources (score = 2.5)

General information about the values of local management of marine resources was discussed using five peer-reviewed papers and two reports. Additionally general information about giant clams was sourced from six peer-reviewed papers and two reports. One peer-reviewed paper supplied information about the relationship between reef health and local management on Upolu Island. Information sources about giant clams in Samoa, and Samoa's community-based fish reserves, included one poster on common fish reserve species, one peer-reviewed paper and three reports. Three reports included information about invertebrates, corals and fishes in this area, a peer-reviewed paper contained a brief mention of this SUMA's name, and another included recent estimates of the reef's benthic structure and cover.

Obligations (score = 2)

The Fisheries Management Act 2016 provides for the protection of clams and states that a precautionary approach must be applied to the management of fish stocks and the sustainable use of all aquatic resources. Establishing well-protected marine reserves is also a priority within the NAPA and NBSAP. The village fisheries' by-laws provide for the conservation and management of the local environment, and for the management of community-based fish reserves.

Four giant clam species are listed as Vulnerable on the IUCN Red List of Threatened Species: *T. derasa*, *T. gigas*, *T. rosewateri* and *T. mbalavuana*. The first three species are threatened due to significant declines (>30%) in populations across their range (criterion A2cd) resulting from reductions in area of occupancy, extent of occurrence and/or habitat quality and/or actual or potential levels of exploitation. Four other species, *T. maxima*, *T. squamosa*, *Hippopus hippopus*, and *H. porcellanus* are listed as "Lower Risk/conservation dependent" (www.iucnredlist.org). Clams are also listed in Appendix II of the Convention of International Trade in Endangered Species (CITES).

Site UI 4: *Fagaloa Bay*

Figure 16. Site UI 4: Fagaloa Bay

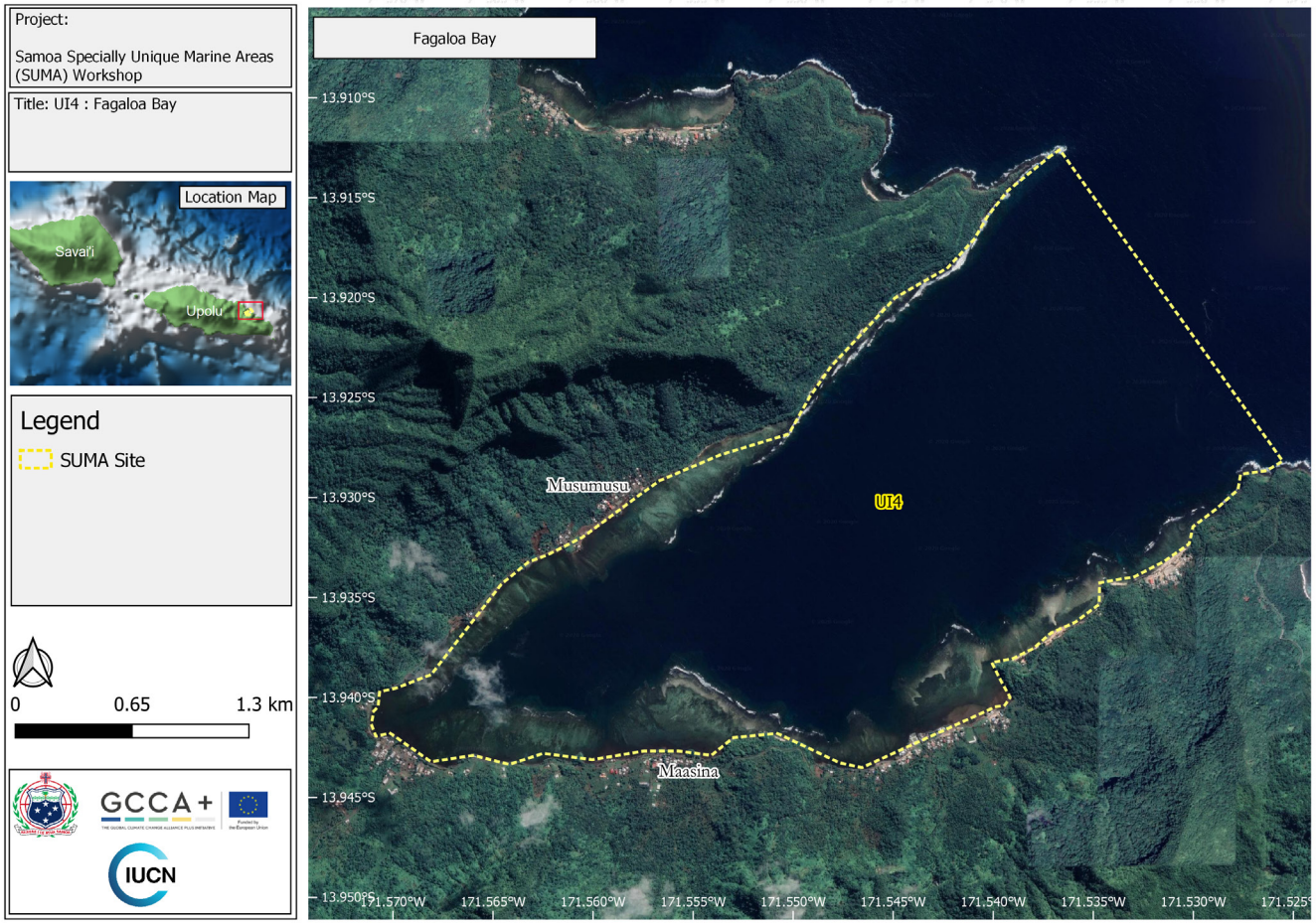


Table 13. Site UI 4: Fagaloa Bay

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Upolu	Fagaloa Bay	UI4	8.5

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	UI4 A	-13.94109523	-171.5706435
	UI4 B	-13.92817952	-171.5255352

Geographic description (score = 3)

Fagaloa Bay, located on the northeastern coast of Upolu Island, is the largest bay in Samoa. The SUMA measures just over 6 km² and includes all the marine habitats present in the bay. Although a number of freshwater streams and creeks drain into the bay, it is well-flushed by the tides.

Justification (score = 1.5)

Workshop participants recognised Fagaloa Bay as the largest in Samoa. The surrounding terrestrial areas are protected under the Fagaloa Bay – Uafato Tiavea Conservation Zone, selected by the World Heritage Commission for its endemic flora and fauna and marine resources (UNESCO WHC, 2006a). The primary marine habitat found in this SUMA are coral reefs. A 2012 report deemed the northern coastline of Upolu from the Manono-Apolima Strait to Fagaloa Bay as the most severely depleted and degraded in terms of coral and fish biomass and species diversity (MNRE, 2013; Sesega, 2014). Recent surveys of the reefs of Upolu found that, together with other reefs in the vicinity, average coral cover was as low as 4%, with 64% of the substratum covered in algae (Kendall and Poti, 2011; Ziegler *et al.*, 2018). Coralline algae was also relatively low in cover (20%), but a high number of coral recruits existed (Ziegler *et al.*, 2018).

Coral cover has been high in the past; in 1996 a site near the entrance of the bay was identified as the highest in the Samoan Archipelago and deemed in "exceptionally good condition" (Green, 1996). This suggests the current degraded state is due to repeated disturbances and that the possibility of recovery exists given the right conditions. Inside the bay, a survey of the Musumusu fish reserve found that the reef flat was dominated by massive *Porites* spp. corals which can withstand high turbidity (Tauati, 2014a). Fish density, biomass and species richness on reefs in the general area was moderate in the mid-1990s (Skelton *et al.*, 2000), and low in later years (Kendall and Poti, 2011); Fagaloa Bay itself appeared to have medium density biomass and species richness of fish (Green, 1996; Kendall and Poti, 2011), and a fish assemblage typical of turbid coastal reefs on reef flats inside the bay (Tauati, 2014a). Lovell (2004) reported 68 species of corals in Fagaloa Bay, including 32 which, until that time, had not been found elsewhere in Samoa (Table 14).

Samoa's volcanic geology has formed coastlines of old lava flows and narrow fringing coral reef (Ellison, 2009; Taule'alo, 1993), covering approximately 490 km² (Moritz

Table 14. Species of corals recorded from Fagaloa Bay and reported by Lovell (2004). Note that coral taxonomy is currently under revision and some names may have changed. Species found only in Fagaloa Bay at the time of the surveys are highlighted in bold.

Family POCILLOPORIDAE
Pocillopora damicornis (Linnaeus, 1758)
Pocillopora eydouxi (Edwards & Haime, 1860)
Pocillopora verrucosa (Ellis & Solander, 1786)
Pocillopora meandrina Dana, 1846
Seriatopora hystrix Dana, 1846
Family ACROPORIDAE
Acropora (I.) crateriformis (Gardiner, 1898)
Acropora (A.) abrotanoides (Lamarck, 1816)
Acropora (A.) aspera (Dana, 1846)
Acropora (A.) austera (Dana, 1846)
Acropora (A.) cerealis (Dana, 1846)
Acropora (A.) clathrata (Brook, 1891)
Acropora (A.) cytherea (Dana, 1846)
Acropora (A.) digitifera (Dana, 1846)
Acropora (A.) divaricata (Dana, 1846)
Acropora (A.) gemmifera (Brook, 1892)
Acropora (A.) grandis (Brook, 1892)
Acropora (A.) humilis (Dana, 1846)
Acropora (A.) hyacinthus (Dana, 1846)
Acropora (A.) intermedia (Dana, 1846)
Acropora (A.) latistella (Brook, 1892)
Acropora (A.) microphthalma (Verrill, 1869)
Acropora (A.) muricata (Dana, 1846)
Acropora (A.) nana (Studer, 1878)
Acropora (A.) nasuta (Dana, 1846)
Acropora (A.) paniculata Verrill, 1902
Acropora (A.) pulchra (Brook, 1891)
Acropora (A.) robusta (Dana, 1846)
Acropora (A.) samoensis (Brook, 1891)
Acropora (A.) secale (Studer, 1878)
Acropora (A.) selago (Studer, 1878)
Acropora (A.) subulata (Brook, 1893)
Acropora (A.) tenuis (Dana, 1846)
Astreopora sp.
Montipora sp. 2
Family AGARICIIDAE
Pachyseris speciosa (Dana, 1846)
Pavona decussata (Dana, 1846)
Pavona maldivensis (Gardiner, 1905)
Pavona varians Verrill, 1864
Family SIDERASTREIDAE

Table 14. Species of corals recorded from Fagaloa Bay and reported by Lovell (2004). Note that coral taxonomy is currently under revision and some names may have changed. Species found only in Fagaloa Bay at the time of the surveys are highlighted in bold. (Cont.)

***Coscinaraea* spp.**
***Psammocora superficiales* Gardiner, 1898**
Family FUNGIIDAE
***Fungia (D.) scruposa* Kluzinger, 1879**
Fungia (P.) scutaria Lamarck, 1801
Fungia (V.) repanda Dana, 1846
Herpolitha limax (Houttuyn, 1772)
Family PORITIDAE
***Goniopora* sp.**
Porites (P.) cylindrica Dana, 1846
Porites (P.) lobata Dana, 1846
***Porites (P.) lutea* Edwards & Haime, 1860**
Porites (S.) rus (Forskal, 1775)
Family FAVIIDAE
Diploastrea heliopora (Lamarck, 1816)
***Echinopora lamellosa* (Esper, 1795)**
***Favia* spp.**
Favia matthai Vaughan, 1918
***Favites* spp.**
Favites halicora (Ehrenberg, 1834)
***Favites russeli* (Wells, 1954)**
***Goniastrea* spp.**
Leptoria phrygia (Ellis & Solander, 1786)
Montastrea curta (Dana, 1846)
***Oulophyllia crispa* (Lamarck, 1816)**
Family OCULINIDAE
Galaxea fascicularis (Linnaeus, 1767)
Family MERULINIDAE
***Hydnophora exesa* (Pallas, 1766)**
***Merulina ampliata* (Ellis & Solander, 1786)**
Family MUSSIDAE
***Acanthastrea* sp.**
***Symphyllia recta* (Dana, 1846)**
Family PECTINIIDAE
***Mycedium elephantotus* (Pallas, 1766)**
Oxypora spp.
TOTAL GENERA 29
TOTAL SPECIES 68

et al., 2018) along the coastlines of the two main islands. Most of the fringing reefs are close to shore, while a few tracts of reef further from shore have allowed the formation of narrow, shallow lagoons with reef flat habitat and patch reefs (Tiitii and Aiafi, 2016). Fringing reefs extend seaward to 3 km of the northern side of the islands, enclosing shallow and usually turbid lagoons; on the southern, windward shores the lagoons are clearer (Skelton *et al.*, 2000). Approximately 962 species of reef fishes and 127 species of corals have been recorded from both Samoa and American Samoa (Ellison, 2009; Kulbicki *et al.*, 2011; Lovell, 2004; MNRE, 2001; Skelton *et al.*, 2000).

As in many other parts of the Indo-Pacific, coral communities in Samoa have been heavily impacted by cyclones, tsunamis, crown-of-thorns sea star outbreaks and coral bleaching events in the last three decades (Green, 1996; McAdoo *et al.*, 2011; Ziegler *et al.*, 2018). Island-wide coral cover in 2008 was 47.5% in Savai'i, but only 23.2% on Upolu and 32.6% on Manono; the cover of algae was also much lower in Savai'i (7.1%) than in Upolu and Manono (21.5 and 15.1%, respectively) (Lovell *et al.*, 2008). A recent survey found that coral cover at many sites around both Upolu and Savai'i was relatively low (> 10% cover at 78% of sites). Standing skeletons of dead corals were testament to a recent (pre-disturbance) past when coral cover was likely to have been between 60 and 80 % (Ziegler *et al.*, 2018); cyclone and tsunami affected reefs tend to have more rubble (Moritz *et al.*, 2018).

A 2018 survey reported a general pattern of higher macroalgal cover on turbid reefs close to human settlements with a high concentration of nutrients, and higher coral cover in remote or protected areas (Ziegler *et al.*, 2018). A more recent survey, which recorded benthos at 14 sites spread evenly around the reef crests of both islands, recorded an average of 13% coral cover at Savai'i and 9% on Upolu (Seinor *et al.*, 2020) (Table 15). It should be noted that these two studies surveyed different habitats and different areas of the reefs and may not be directly comparable beyond these broad generalities. Coral cover in 2020 was highest at reef crest sites on Savai'i Island that were under some form of protection, but this difference was not statistically significant, likely due to limited degrees of freedom available for the test (Figure 15).

Data gleaned from community-based fish reserve assessment reports from surveys conducted on shallow reef flats suggested a similar trend of higher coral cover on Savai'i than Upolu, with the lowest coral cover on Upolu's northern and western sides (Figure 18). Macroalgal cover also appeared higher in the same areas, while the "dead corals and algae" category was slightly higher on Savai'i Island. The composition of coral growth forms was also slightly different between the two islands; while both had a high proportion of branching *Acropora* spp., Savai'i had more foliose corals and branching morphologies from other families, and Upolu had more massive and submassive corals (Figure 19).

Table 15. Benthic components recorded at 14 sites at each island by Seinor *et al.* (2020)
* community-based fish reserves
** Marine Protected Areas

Island	Aspect	Site	Depth (m)	Turf algae (%)	CCA (%)	Macroalgae (%)	Invert. (%)	Dead coral (%)	Live coral (%)
Upolu	N	Saoluafata*	2.3	35.1	11.3	27.1	0.6	1	18.5
	N	Nofoalii*	1.7	17.4	24.1	42.4	1.3	0.4	8.2
	N	Mulifanua*	2.2	32.8	30.7	16.8	1.1	0.5	8.4
	N	Manono*	2.2	21.6	55.4	9.9	1.6	0.6	4.9
	S	Lefaga*	2.7	22.6	51.8	11.8	2.3	0.3	10.4
	N	Mulinu'u	4.9	26.8	38.3	6.9	2.6	1.6	15.4
	S	Sa'anapu**	2.7	28.3	40.1	8.3	7	0.6	12.5
	S	Si'umu	3.5	28.9	34.4	6.4	7.3	0.9	13.9
	S	Safata**	3.9	42	28.1	7.9	0.3	0.3	2.3
	S	Malaemalu	2.3	34.1	26.9	9.7	6.3	0.4	9.2
	S	Salani	3.9	19.7	46.7	18.8	2.8	0.8	8.1
	S	Lepa*	2.4	35	22.3	10.6	7.7	0	9.5
	S	Saleapaga*	3.7	31.9	28.9	17.8	6.4	0.1	3.9
	S	Vailoa	3.2	22.9	42.2	5.5	3	0.2	4.7
Savai'i	S	Tafua	2.6	36.3	38.1	6.7	1.7	0.2	12
	S	Papa Puleia*	5.7	21.1	56.9	6.8	7.5	0.1	7.2
	S	Vailoa Palauli	3.4	35.1	40.1	9.8	2.2	0.3	8.5
	S	Satuiatua*	4.4	21.9	46.8	4.3	0.9	0	15.3
	S	Foailalo*	3.5	27.8	28.9	2	2.3	0.4	21.1
	S	Fagasa*	4.3	23.6	22.7	2.7	0.8	0.7	28.5
	N	Vaisala*	4.8	24.8	32.8	3.8	1.3	1.3	21.1
	N	Falealupo*	3.3	34.9	32.6	1.9	0.4	0.1	20.2
	N	Fatuvalu*	3.7	40.8	36.6	5.1	1.5	0.5	8.2
	N	Fagamalo*	3	41.7	39.1	5	0.2	0	2.2
	N	Lano	0.8	21.3	38.3	7	0.2	0.3	5.2
	N	Faga*	3.9	17.5	62.4	3.8	1.4	0.3	4.2
	N	Saleluvalu*	3.9	23	40.1	7.6	0.5	0.6	26.9
	N	Salelologa*/**	3.4	40.4	45.1	8.5	0.5	0.4	4.1

Figure 17. Percentage cover of live hard corals at reef crest sites of Samoa's two main islands, as presented by Seinor *et al.* (2020).

The estimates of average coral cover are separated by areas open to fishing and those protected either as MPAs or community-based fish reserves, or both (see Table 15). Differences are not statistically significant (ANOVA, Island x Protection interaction term, F1 = 2.97, p = 0.09). Error bars = 1 SE.

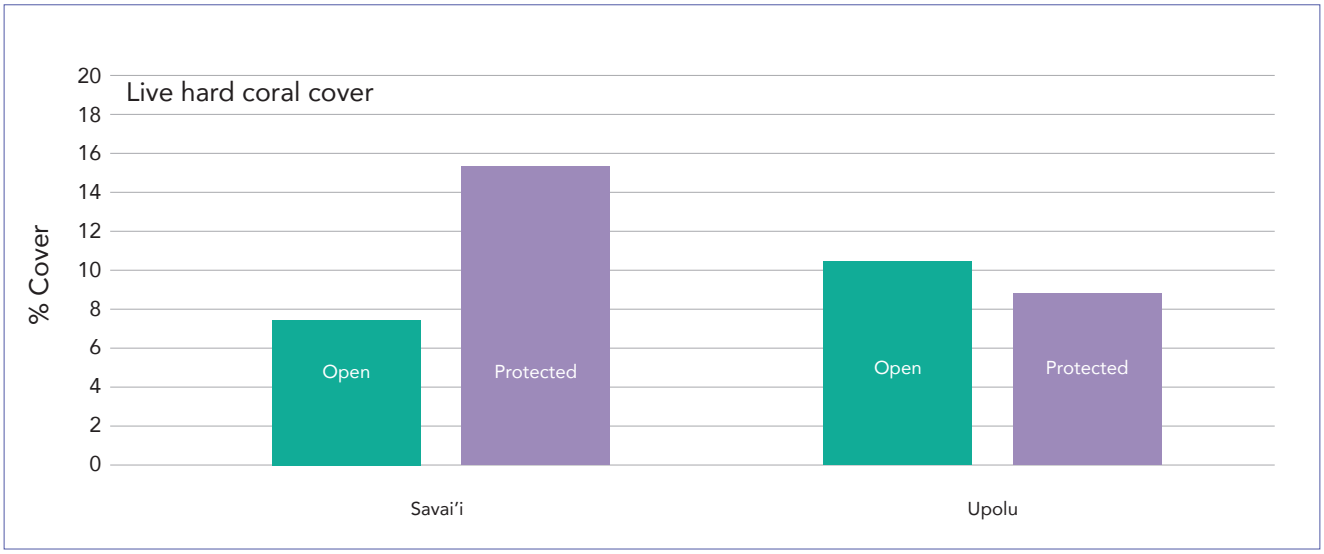
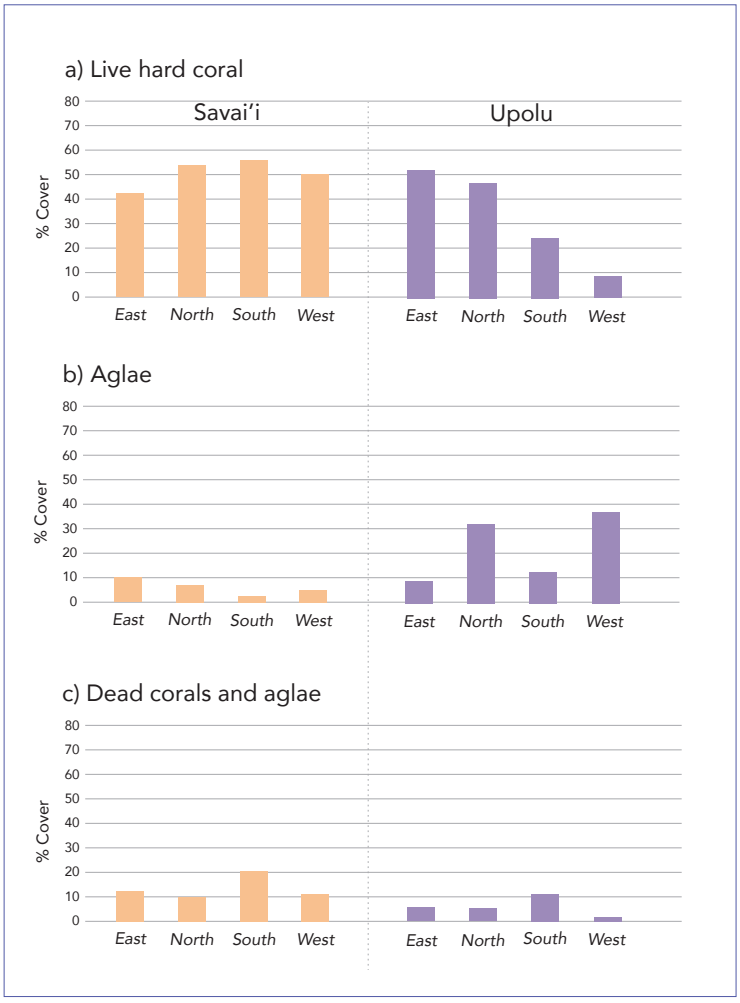


Figure 18. Percentage cover of a) live hard corals, b) algae and c) dead coral skeletons covered in turf alage at reef flat sites of Samoa's two main islands, as presented by 65 community-based fish reserve assessment reports. *The estimated means are derived from reserve-wide means, grouped by aspect on the two main islands. Differences in areas surveyed and observers preclude statistical testing. Error bars = 1 SE.*



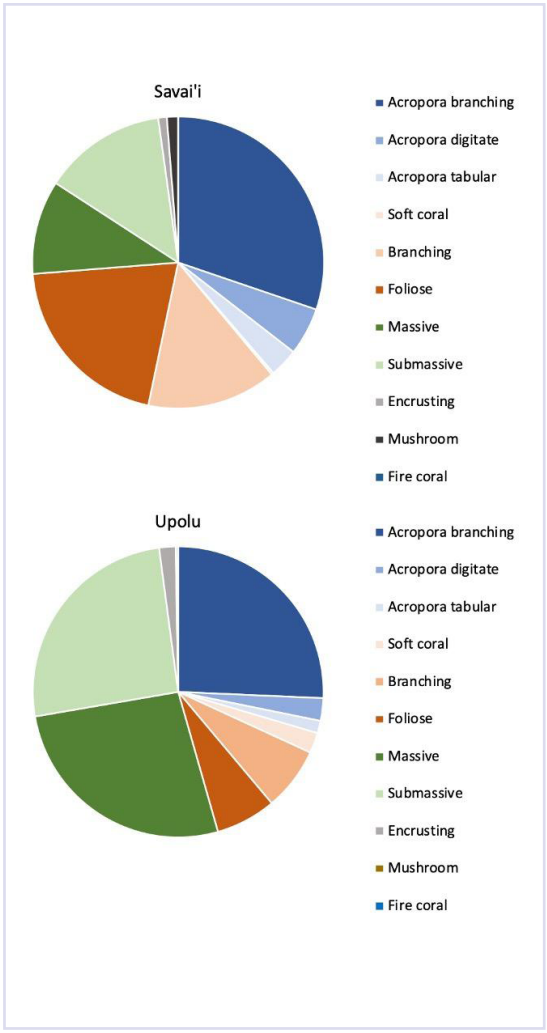


Figure 19. Proportion of different coral categories found at reef flat sites of Samoa's two main islands, as presented by 65 community-cased fish reserve assessment reports; proportions are averaged across all reserves for each island.

The main anthropogenic impacts to coral reefs in Samoa are likely to be a combination of bleaching events, sedimentation from rain events, land clearing for development and agriculture, and overfishing (Lovell *et al.*, 2008; NTT, 2005). This increases the protection of highly sheltered reefs such as those in Fagaloa Bay from mechanical damage, but ameliorates potential impact from land-based run-off and human use. Furthermore, these reefs remain vulnerable to increasing ocean temperatures and crown-of-thorns starfish outbreaks (Ziegler *et al.*, 2018). An outbreak was detected in Fagaloa Bay in the early 1990s (Zann and Bell, 1991), while the most recent outbreak on Upolu (2011 – 2015) caused widespread coral mortality despite collection efforts to mitigate the damage (Kwan *et al.*, 2016; Tiitii, 2011).

The 2016 and 2017 heatwaves that caused bleaching in many parts of the world also impacted Samoan Reefs (Moritz *et al.*, 2018). One of the largest anthropogenic impacts on marine environments of Fagaloa Bay has been the Afulilo Dam. The study of the dam's impact found high levels of phosphates, nitrates, tannins and sedimentation, and associated turbidity, affecting the coral reefs of the Bay (SMEC, 2011).

Overexploitation also affects coral reefs and the organisms that live on them (Pinca *et al.*, 2010; Teh *et al.*, 2015). Many species of fish and invertebrates in Samoa were already identified as overfished in the early 1980s (Johannes, 1982; Zann, 1994). Recently, a survey found that at least two species of reef fishes (*Acanthurus triostegus* and *Zanclus cornutus*) in Upolu were 10 percent smaller than individuals of the same species around other islands in the Pacific, and consisted of smaller schools (Ziegler *et al.*, 2018). Additional surveys report that coral reef invertebrates are present in intermediate to low numbers compared with other Pacific Island countries (Pinca *et al.*, 2010; Tiitii and Aiafi, 2016). Fortunately, protection in no-take reserves and distance from dense human populations appears to generate positive effects on coral reef health and fish communities (Williams *et al.*, 2015; Ziegler *et al.*, 2018).

Biogeographically, the Samoan reef fish fauna forms a group with other Pacific high islands such as those in Tonga, but the group also included regions with primarily low sand islands and atolls, such as Tuvalu and the Marshall Islands (Kulbicki *et al.*, 2011). The species richness of reef fish in Samoa is similar to Tonga (1,031) and intermediate between Fiji (1,337) and the Cook Islands (603) or Tuvalu (615). The reef fish fauna of Samoa is characterized by a large proportion of small sedentary species, such as Gobiidae, Blenniidae and Tripterygiidae as well as eels such as Muraenidae and Ophichthidae; most of these families are invertivorous (Kulbicki *et al.*, 2011).

Globally, coral reefs are among the ecosystems most valued for their high biodiversity, conservation and economic value. As human activities degrade reefs worldwide, resilient coral reefs are becoming more important and valuable for their ability to recover from natural and climate change induced disturbance events. This confers them to a role of refuge and larvae source that assist the recovery of more damaged reefs (Holbrook *et al.*, 2016).

Typically, coral reef resilience is expected to be higher on reefs further from human activities (França *et al.*, 2020; McLean *et al.*, 2016), with intact trophic structure, especially populations of predators and herbivores (Brewer *et al.*, 2012; Holbrook *et al.*, 2016; 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 (Hobbs *et al.*, 2013; Hughes *et al.*, 2002).

Type and number of sources (score = 3)

Coral reefs and associated organisms, and the impacts upon them, were described for Fagaloa Bay using the World Heritage Committee Website, ten reports and one peer-reviewed paper. Further information about coral reefs globally was derived from eleven peer-reviewed papers and eleven reports. Four peer-reviewed papers contained some information about coral reefs in Samoa.

Obligations (score = 1)

The Fisheries Management Act 2016 provides for the protection of coral reefs and dependent species, and prescribes a precautionary approach for the management of fish stocks and the sustainable use of all aquatic resources. The NBSAP set out the intention to improve coral reef health by 2020. Many species that spend all or part of their life cycle in coral reef ecosystems are on the IUCN Red List of Threatened Species, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The Marine Wildlife Protection Regulations 2009 provide for the protection of marine mammals, turtles, sharks and species of conservation concern, such as those listed on international agreements.

Site UI 5: *Tiavea deeper area*

Figure 20. Site UI 5: Tiavea deeper area

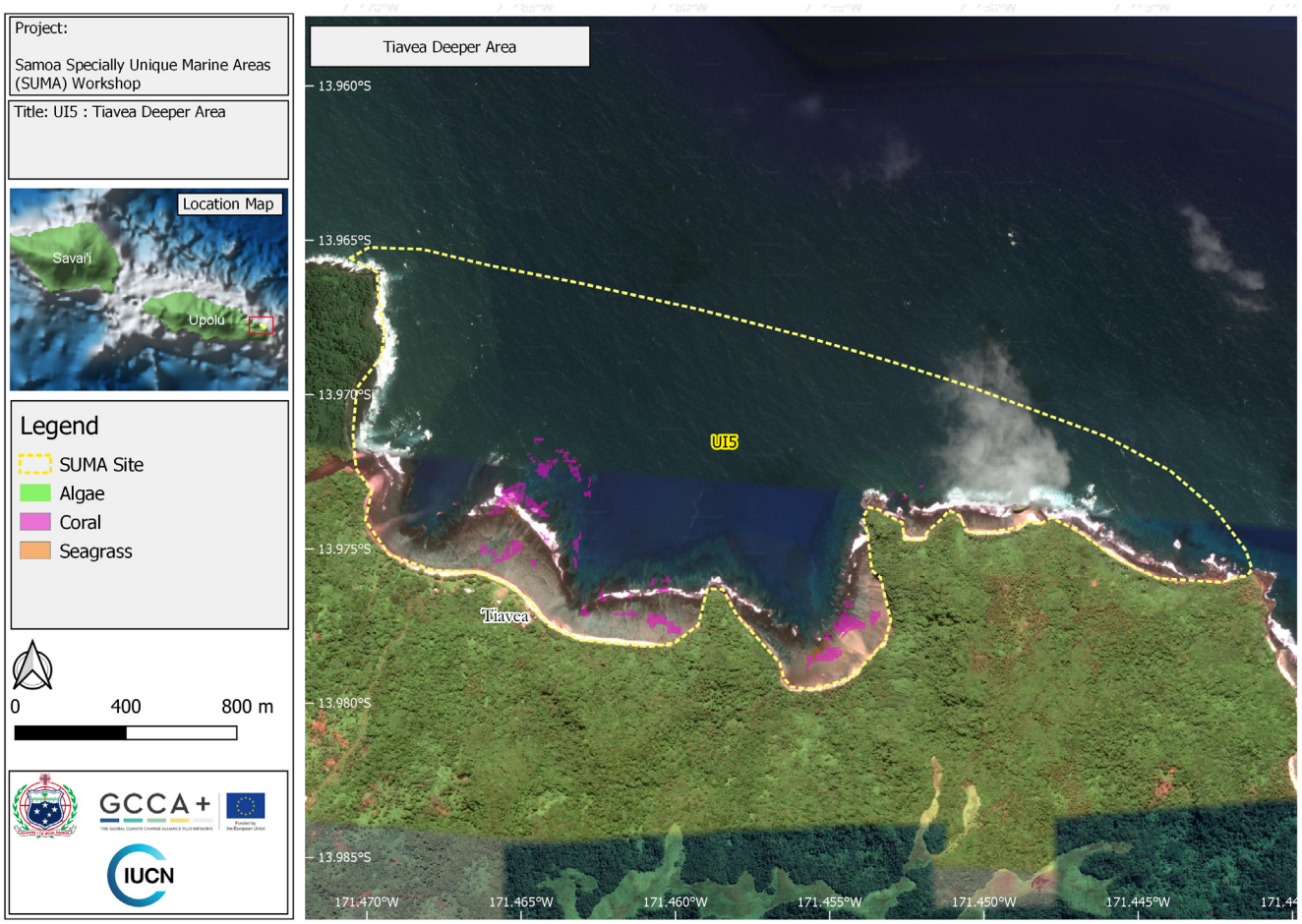


Table 16. Site UI 5: Tiavea deeper area

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Upolu	Tiavea deeper area	UI5	4.5

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	UI5 A	-13.97313051	-171.4698421
	UI5 B	-13.97564606	-171.4413161

Geographic description (score = 1.5)

This SUMA contains the marine environment seaward of the bay at Tiavea, on the northeastern coast of Upolu and east of Fagaloa Bay. The SUMA extends slightly further east from the bay and 1 km out to sea, creating an area roughly 1.5 km² in size.

Type and number of sources (score = 1)

The general sources used to describe coral reefs for Site UI 4: Fagaloa Bay are also relevant here. One additional peer-reviewed paper described coral reef features nearby, and two peer-reviewed papers were used to make inferences about the potential condition of the SUMA.

Justification (score = 1)

This SUMA was chosen for its coral reefs, which are discussed in a general sense, and for Samoa in particular, in Site UI 4: Fagaloa Bay. No further information exists specifically for this site; in fact, none of the studies that surveyed coral reefs on the northern coast of Upolu Island conducted their surveys further east than Fagaloa Bay. The latest published survey by Ziegler *et al.* (2018) found 4% coral cover in Fagaloa Bay and 17% coral cover off the eastern tip of Upolu Island. It could be inferred that coral cover in Tiavea might be somewhere in between these values. This area of the northern Upolu coastline appears to have coral reefs that descend rapidly into deep waters, and may experience greater flushing than reefs further west. This, together with lower human population density on the coast, may lead to a lower incidence of chronic stressors such as sedimentation and overexploitation, and therefore more rapid recovery from disturbance, as has been described elsewhere (Ceccarelli *et al.*, 2019; Sandin *et al.*, 2008).

Obligations (score = 1)

The Fisheries Management Act 2016 provides for the protection of coral reefs and dependent species that depend on them, and prescribes a precautionary approach for the management of fish stocks and the sustainable use of all aquatic resources. The NBSAP set out the intention to improve coral reef health by 2020. Many species that spend all or part of their life cycle in coral reef ecosystems are on the IUCN Red List of Threatened Species, the Convention on Migratory Species of Wild Animals (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The Marine Wildlife Protection Regulations 2009 provide for the protection of marine mammals, turtles, sharks and species of conservation concern, such as those listed on international agreements.

Site UI 6: *Manono Reef Flats*

Figure 21. Site UI 6: Manono Reef Flats

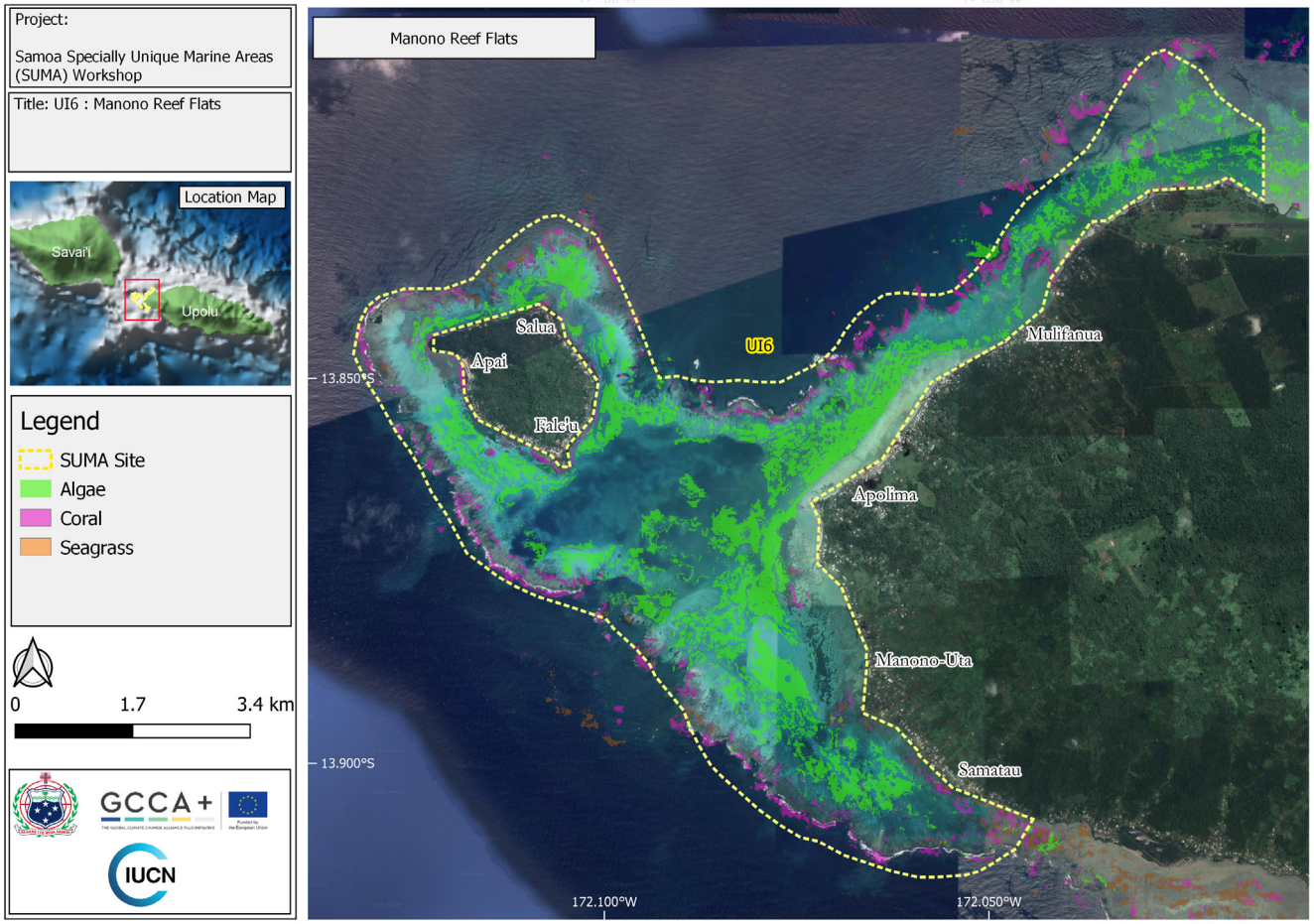


Table 17. Site UI 6: Manono Reef Flats

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Upolu	Manono Reef Flats	UI6	9.5

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	UI6 A	-13.84684938	-172.1326309
	UI6 B	-13.82679442	-172.0143126
	UI6 C	-13.9072704	-172.0442625

Geographic description (score = 2.5)

Manono Island is one of three islands located between Upolu and Savai'i. The reef flat connecting Upolu and Manono Islands is extensive and complex, with sand flats, lagoon-like deeper areas and coral outcrops. The SUMA, which encompasses the reef flat that extends from Samatau to Faleolo on Upolu Island and surrounds Manono Island, measures approximately 40.25 km². The reef flat and island are high points on an underwater ridge that connects Upoli and Savai'i (UNESCO WHC, 2006b).

Justification (score = 2)

This SUMA contains the largest coastal reef system that includes an offshore island and also hosts the largest known seagrass beds in Samoa (MNRE, 2013). It is protected within a community-based fish reserve with stewardship by the surrounding villages. The general area is flushed by currents flowing through the Apolima Strait, but is semi-protected from direct exposure to prevailing winds by Upolu Island itself (Luxton, 1999). The reef flat is considered naturally very productive in terms of commercially important fish and invertebrate species, albeit subject to the same destructive forces that have caused the degradation of reefs in Samoa generally (UNESCO WHC, 2006b; Zann and Bell, 1991).

Recent assessments found that this area was among the more heavily degraded sites, similar to those along the northern Upolu coastline (Sesega, 2014), especially on the shallow reef flats (Tanielu, 2014a; Tiitii and Sapatu, 2012). Reef flats around Manono Island are affected by runoff from construction and agriculture, have low cover of live coral (Aiafi, 2018a) and high macroalgal cover (Aiafi, 2017b). The latest published surveys were conducted by Ziegler *et al.* (2018) and Seinor *et al.* (2020). The former found 1-3% coral cover at sites within this SUMA, along with 16-38% coralline algae cover and 40-64% algal cover. The latter, which focused on the reef crests, found an average coral cover of 7.2%, 37% coralline algae and 23% macroalgae. Earlier surveys found ~20% coral cover in this area, and encrusting corals dominating the coral community (Green, 1996). Later surveys indicate that patches of high coral cover may remain on the reef flat off the north coast of Upolu (Aiafi, 2015a). A number of sites in the SUMA, northeast of Faleolo, had over 50% cover of coralline algae and high numbers of coral recruits (Ziegler *et al.*, 2018), suggesting a high capacity for recovery in this area.

Fish density and species richness on reefs off Faleasi'u were moderate in the mid-1990s and fish biomass was low (Kendall and Poti, 2011; MNRE, 2013). A dominance of small fishes in their juvenile stages during fish reserve surveys suggest that this area has connectivity to larval sources (Aiafi, 2017b; Tanielu, 2014a, 2017; Tiitii and Sapatu, 2012), but density, biomass and species richness of fishes also strongly depends on the quality of the benthic habitat (Tanielu, 2014a). Areas within the SUMA to the south of Upolu Island may be in better condition inferred by coral reef surveys in Samatau showing a trend towards increasing coral cover over time and very high coral cover (>70%) in 2012 (Aiafi, 2012). Various coral morphologies, a diverse reef fish assemblage and a number of high-value sea cucumber species existed (Aiafi, 2012). General information about the values of coral reefs in Samoa and globally are reviewed in Site UI 4: Fagaloa Bay, and also apply here.

A fisheries resource assessment that included Manono-uta and Manono-tai, found relatively high fish biomass and density compared to a number of other sites, but a depleted invertebrate community (Vunisea *et al.*, 2005). High density, biomass, size and biodiversity of fishes on the outer reefs, healthy back-reefs and some patches of high coral cover were also revealed. The reef flat off Apolima-uta appeared to have high-density aggregations of *Holothuria atra* (lollyfish) and *Stichopus chloronotus* (greenfish) (Aiafi and Sapatu, 2012). Seemingly healthy populations of the sea cucumbers *Bohadschia vitiensis* and *Stichopus chloronotus* existed in the lagoon habitats, but an obvious decline in surgeonfishes and parrotfishes from fishing pressure was exhibited, combined with critically low densities of giant clams. Concerns were held about the presence of crown-of-thorns starfish on reef flat areas (Vunisea *et al.*, 2005). The very different conditions expressed in various studies conducted from the 1990s to the present suggest this large area of reef is spatially very variable, incorporating patchy distributions of healthy and degraded habitats, and/or temporally highly dynamic, with multiple cycles of disturbance and recovery over the last three decades.

General information about locally managed marine reserves in Samoa is reviewed in Site UI 3: Lufilufi/ Faleapuna Community-Based Fish Reserve. Communities in the Manono area established six community-based fish reserves in the mid to late 1990s (Skelton *et al.*, 2000): Faleu, Lepuiai, Salua and Apai on Manono Island, and Salua-uta and Faleu-uta on Upolu (King and Fa'asili, 1999). Subsequently, additional fish reserves were established,

including Samatau, Satuimalufilufi, Lalovi, Fuailolo'o and Mulifanua on the mainland (Tiitii and Sapatu, 2012). Juveniles of the clam *Tridacna derasa* were introduced into the reserves for stocking and fisheries development purposes (Skelton *et al.*, 2000). The communities also agreed to remove crown-of-thorns starfish, introduce mesh and bag size limits, ban dynamite and other destructive fishing practices, enforce no-take regulations and other measures to ensure sustainable fishing (King and Faasili, 1999). The long-term effects of these measures are not known.

Seagrass beds provide food and key habitat for numerous marine organisms, including protected species (e.g. dugongs, green turtles) and species of commercial or subsistence value (e.g. emperors, crustaceans). 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 supporting coastal protection (Norlund *et al.*, 2016). They are vulnerable to poor water quality, excessive sedimentation and destructive fishing (Ellison, 2009).

The seagrass communities of Samoa are thought to consist of only four species: *Halophila ovalis*, *Halophila ovalis* ssp. *bullosa*, *Halophila ovata* and *Cymodocea serrulata* (Ellison, 2009). An endemic species of seagrass, *Halophila ovalis* ssp. *bullosa*, occurs in Fiji, Tonga and Samoa (Ellison, 2009). Dense stands of seagrasses are generally located in shallow sandy lagoons, bays and intertidal areas (Kalfatak and Jaensch, 2014). In this SUMA, seagrass beds are thought to be most extensive just off the northwestern coast of Upolu Island. A fish reserve survey documented a reef flat area to the west of Manono Island where seagrasses were the dominant benthos (Tanielu, 2018a). However, the extent and distribution of seagrass beds in Samoa is a key knowledge gap (MNRE, 2013).

Type and number of sources (score = 3)

The general sources used to describe coral reefs for Site UI 4: Fagaloa Bay and village fish reserves for Site UI 3: Lufilufi/Faleapuna Community-Based Fish Reserve are also relevant here. Additional sources to describe this SUMA included 17 reports, two peer-reviewed papers and the UNESCO-WHC website, albeit primarily providing cultural information. Seagrass beds in general in Samoa and in this SUMA, were described using three peer-reviewed papers and two reports.

Obligations (score = 2)

The Fisheries Management Act 2016 provides for the protection of coral reefs and dependent species, and prescribes a precautionary approach for the management of fish stocks and the sustainable use of all aquatic resources. The village fisheries' by-laws provide for the conservation and management of the local environment, and for the management of community-based fish reserves. The NBSAP set out the intention to improve coral reef health by 2020. Many species that spend all or part of their life cycle in coral reef ecosystems are on the IUCN Red List of Threatened Species and listed under the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The Marine Wildlife Protection Regulations 2009 provide for the protection of marine mammals, turtles, sharks and species of conservation concern, such as those listed on international agreements.

Site UI 7: *Five Mile Reef*

Figure 22. Site UI 7: Five Mile Reef

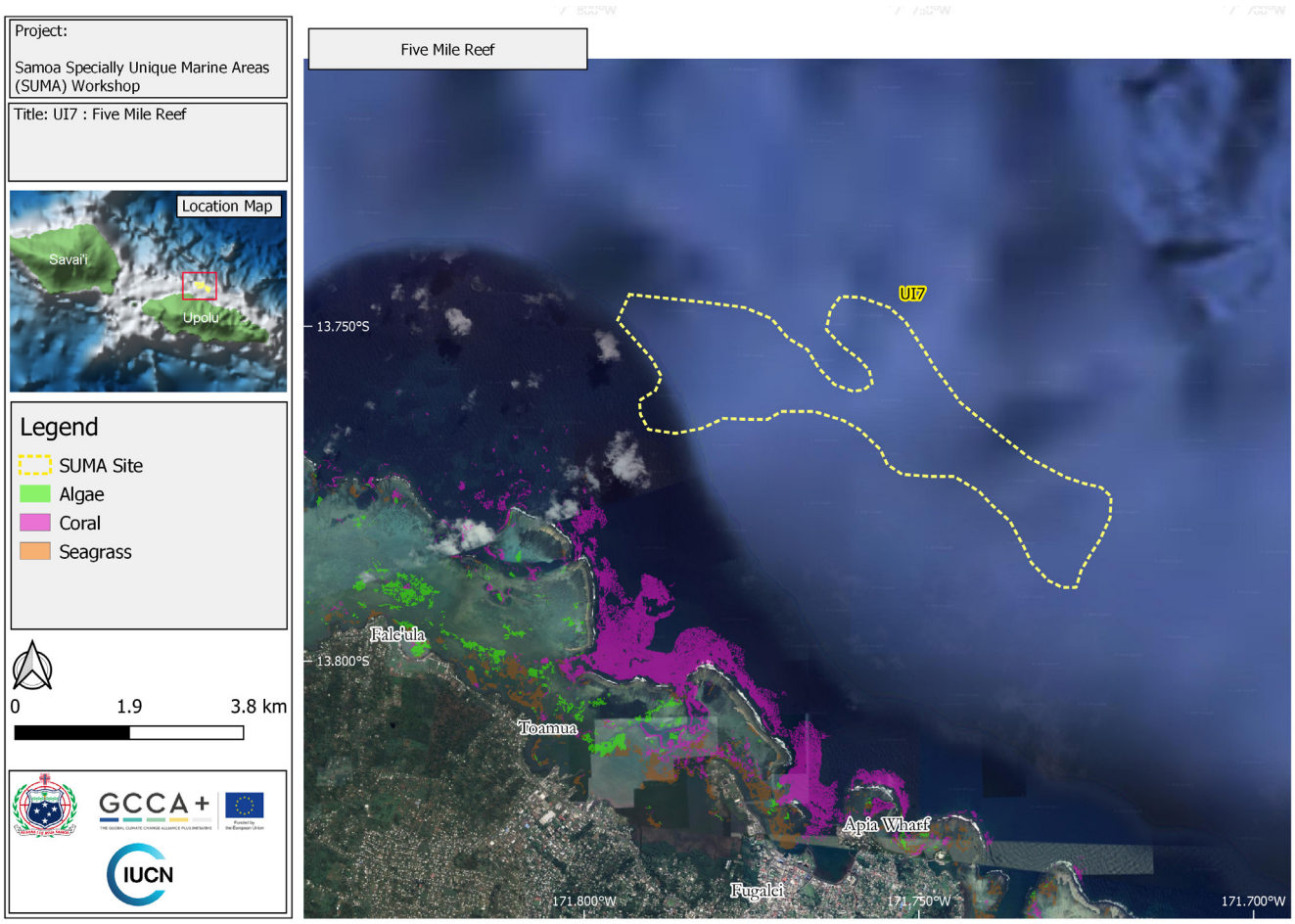


Table 18. Site UI 7: Five Mile Reef

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Upolu	Five Mile Reef	UI7	12

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	UI7 A	-13.7491274	-171.7950346
	UI7 B	-13.77540187	-171.7212869

Geographic description (score = 3)

Five Mile Reef, or To'atuga Reef, is located approximately 7 km seaward and to the north of Apia Harbour, off the north coast of Upolu Island. It is an elongate ridge of reef extending in a NW–SE axis, with a broad reef top measuring 1,303 ha at depths of 15-22 m, descending to a sand and rubble bottom at 35-40 m. The reef top is characterised by low topographic relief with small ridges and depressions. The SUMA encompasses the reef top.

Justification (score = 3)

Five Mile Reef is a unique reef system in Samoan waters, which has been recognised as a Key Biodiversity Area (KBA) and is thought to provide a source of larvae for Upolu's coral reefs to the south. In 2004 a survey was undertaken to describe the attributes of this reef; such information is rare for other coral reefs in Samoa (Lovell, 2004).

The distance from the coast, exposure to higher wave energy and the current's westerly direction creates a relatively isolated reef system, unlike the highly interconnected fringing reefs around the main islands. In 2004, Five Mile Reef was showing the effects of the 2002 bleaching event represented by large stands of dead tabular *Acropora* colonies and a slope dominated by the more robust *Porites* spp. (Lovell, 2004). Shallow reef benthic communities were dominated by low-lying, robust forms of organisms, typical of wave-swept oceanic reefs. Average live coral cover was 22%, coralline algae cover was 39% and the remaining benthos was almost entirely composed of dead standing corals and abiotic components.

A species list of corals amounted to 64 species from 28 genera, of which 38 species (60%) at the time of the surveys were not encountered elsewhere in Samoa (Table 19). General information about the values of coral reefs in Samoa and globally are reviewed in Site UI 4: Fagaloa Bay, and also apply here. However, the combination of isolation and exposure to oceanic conditions make Five Mile Reef unique among Samoan coral reefs, which was also reflected in the high proportion of coral species not documented elsewhere in Samoa.

Five Mile Reef is listed as one of the seven marine KBAs in Samoa (Conservation International, 2010). Key Biodiversity Areas are sites of global significance for biodiversity conservation, chosen using transparent, globally standard criteria (Conservation International, 2010). As part of the Polynesia-Micronesia Biodiversity Hotspot, Samoa is one of 34 regions in the world where extraordinary levels of biodiversity and endemism are identified as being under extremely high levels of threat (Mittermeier *et al.* 2004). The marine KBAs of Samoa cover approximately 173km^2, or 23% of Samoa's total coral reef area. Three of the seven marine KBAs have been completely or partially protected as conservation areas by the Government of Samoa or local communities. The species listed as especially important for conservation purposes in this KBA are the bumphead

Table 19. Species of corals recorded from Five Mile Reef and reported by Lovell (2004). *Note that coral taxonomy is currently under revision and some names may have changed. Species found only on Five Mile Reef at the time of the surveys are highlighted in bold.*

Family POCILLOPORIDAE
Pocillopora eydouxi (Edwards & Haime, 1860)
Pocillopora verrucosa (Ellis & Solander, 1786)
Pocillopora meandrina Dana, 1846
Family ACROPORIDAE
Acropora (I.) crateriformis (Gardiner, 1898)
Acropora (A.) sp. 1
Acropora (A.) sp. 2
Acropora (A.) abrotanoides (Lamarck, 1816)
Acropora (A.) chesterfieldensis Veron & Wallace 1984
Acropora (A.) clathrata (Brook, 1891)
Acropora (A.) *cytherea* (Dana, 1846)
Acropora (A.) *dendrum* (Bassett-Smith, 1890)
Acropora (A.) divaricata (Dana, 1846)
Acropora (A.) florida (Dana, 1846)
Acropora (A.) glauca
Acropora (A.) globiceps (Dana, 1846)
Acropora (A.) humilis (Dana, 1846)
Acropora (A.) lutkeni
Acropora (A.) microclados (Verrill, 1869)
Acropora (A.) *monticulosa* (Bruggemann, 1879)
Acropora (A.) nasuta (Dana, 1846)
Acropora (A.) robusta (Dana, 1846)
Acropora (A.) secale (Studer, 1878)
Astreopora listeri (Bernard, 1896)
Montipora sp. 2
Montipora cf. *australiensis* (Bernard, 1897)
Montipora danae (Edwards & Haime, 1851)
Montipora corbettensis Veron & Wallace 1984
Montipora efflorescens Bernard, 1897
Montipora grisea Bernard, 1897
Montipora nodosa (Dana, 1846)
Montipora turgescens Bernard, 1897
Montipora venosa (Ehrenberg, 1834)
Montipora verrucosa (Lamarck, 1826)
Family AGARICIIDAE
Pavona duerdeni Vaughan, 1907
Pavona maldivensis (Gardiner, 1905)
Pavona varians Verrill, 1864
Leptoseris explanata Yabe & Sugiyama, 1941

Family SIDERASTREIDAE
***Coscinaraea columna* (Dana, 1846)**
***Psammocora nierstraszi* Horst, 1921**
***Psammocora profundacella* Gardiner, 1898**
***Psammocora haimeana* Milne Edwards & Jaime, 1851**
Family FUNGIIDAE
***Cycloseris vaughani* (Boschma, 1923)**
***Fungia danai* Milne Edwards & Jaime, 1851**
Fungia (D.) fungites (Linnaeus, 1758)
***Fungia horrida* (Dana, 1846)**
Fungia (P.) scutaria Lamarck, 1801
Fungia (V.) repanda Dana, 1846
***Halomitra pileus* (Linnaeus, 1758)**
***Sandalolitha dentata* Quelch, 1884**
Family PORITIDAE
***Alveopora verrilliana* Dana, 1872**
Porites (P.) lobata Dana, 1846
Porites (S.) rus (Forskal, 1775)
Family FAVIIDAE
***Cyphastrea chalcidicum* (Forskal, 1775)**
***Cyphastrea serailia* (Forskal, 1775)**
***Echinopora gemmacea* Lamarck, 1816**
***Echinopora pacificus* Veron, 1990**
***Favia stelligera* Dana, 1846**
***Goniastrea aspera* (Verrill, 1905)**
Leptastrea purpurea (Dana, 1846)
Leptoria phrygia (Ellis & Solander, 1786)
Montastrea curta (Dana, 1846)
Family OCULINIDAE
Galaxea fascicularis (Linnaeus, 1767)
Family MERULINIDAE
***Merulina scabricula* (Dana, 1846)**
Family MUSSIDAE
Lobophyllia sp.
TOTAL GENERA 28
TOTAL SPECIES 64

parrotfish (*Bolbometopon muricatum*), humphead wrasse (*Cheilinus undulatus*), and the coral species *Acropora dendrum*, *Acropora globiceps*, *Acropora microclados*, *Alveopora verrilliana* and *Montipora australiensis*.

The bumphead parrotfish and the humphead wrasse are among the largest bony fishes found on Indo-Pacific coral reefs; both mature late (~ 6 years of age) and grow slowly, reaching over one meter in length (Taylor *et al.*, 2018). Widespread population declines have been reported for both species across their ranges, sparking concern over their status, especially as localised conservation efforts have not always been successful (Hamilton *et al.*, 2019; Sadovy de Mitcheson *et al.*, 2019). The population declines have been attributed to commercial fishing pressure to supply local, national and international markets and the loss of inshore recruitment habitat due to coral reef degradation (Hamilton *et al.*, 2017).

Humphead wrasse are important predators of invertebrates, including crown-of-thorns starfish (Sadovy *et al.*, 2003). Bumphead parrotfish contribute to the health of coral reefs by consuming algae that compete with corals for space, and aid in the corals' reproduction by fragmenting the corals, which allows polyps to spread and colonize other sections of reef. Their consumption of living corals, including the calcium carbonate skeletons, results in the production of a significant proportion of sand (Goldberg *et al.*, 2019). The presence, abundance and status of these species at Five Mile Reef are currently unknown.

Type and number of sources (score = 3)

The general sources used to describe coral reefs for Site UI 4: Fagaloa Bay are also relevant here. Further information about KBAs in Samoa was identified from two reports; two of the indicator species for the KBA were described using six peer-reviewed papers. This SUMA has benefited from direct ecological surveys described in one report.Two additional reports mentioned the SUMA as being significant, especially as a KBA.

Obligations (score = 3)

The Fisheries Management Act 2016 provides for the protection of coral reefs and dependent species, and prescribes a precautionary approach for the management of fish stocks and the sustainable use of all aquatic resources. The NBSAP set out the intention to improve coral reef health by 2020. Many species that spend all or part of their life cycle in coral reef ecosystems (see the KBA trigger species list above, especially the bumphead parrotfish (*Bolbometopon muricatum*), and humphead wrasse (*Cheilinus undulatus*)) are on the IUCN Red List of Threatened Species and the Convention on Migratory Species (CMS). The Marine Wildlife Protection Regulations 2009 provide for the protection of marine mammals, turtles, sharks and species of conservation concern, such as those listed on international agreements.

Site UI 8: *Apolima*

Figure 23. Site UI 8: Apolima

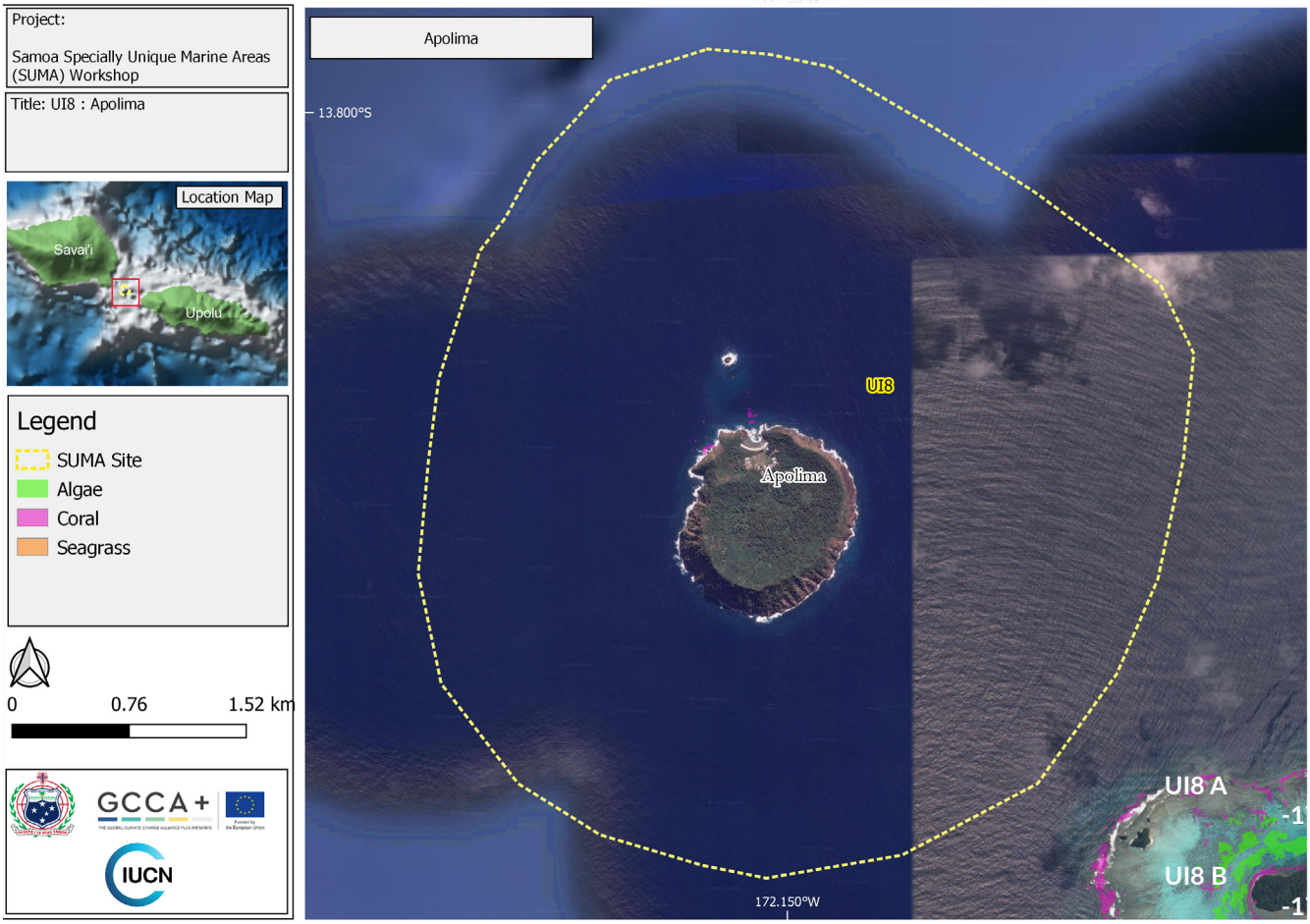


Table 20. Site UI 8: Apolima

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Upolu	Apolima	UI8	8

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	UI1 A	-13.82829352	-171.7914506
	UI1 B	-13.8238695	-171.7745457

Geographic description (score = 2.5)

Apolima, the smallest of Samoa's four inhabited islands, is located, between Upolu to the east and Savai'i to the west, in the Apolima Strait. It is just over three kilometres west of Manono Island. The SUMA is the marine area surrounding the island, with a circular boundary approximately 2km from the island's coastline.

Justification (score = 1.5)

Apolima is mentioned in the UNESCO-WHC website as part of the "Manono, Apolima and Nu'ulopa Cultural Landscape," albeit primarily for cultural reasons (UNESCO WHC, 2006b). The island has a narrow band of coral reef habitat and is recognised as a Key Biodiversity Area (KBA). The KBA and the SUMA cover roughly the same area of marine habitat (2,129 ha); bumphead parrotfish (*Bolbometopon muricatum*) and humphead wrasse (*Cheilinus undulatus*) are thought to inhabit the reef (Conservation International, 2010). The reef around Apolima is relatively isolated and difficult to access, and it is recognised that the community on the island has a history of managing their marine resources, despite the lack of formal protection (Conservation International, 2010). General information about the values of coral reefs and KBAs in Samoa and globally are reviewed in Site UI 4: Fagaloa Bay and Site UI 7: Five Mile Reef, and also apply here.

It is thought that there is upwelling in the Apolima Strait (Vunisea *et al.*, 2005); chlorophyll-a and nitrate concentrations in this area are relatively high (CSIRO, 2009). This could enhance the productivity of waters surrounding the reef, potentially creating cooler conditions during heatwaves that cause bleaching elsewhere (Randall *et al.*, 2020). However, existing reports include the reefs of the Apolima Strait among the most degraded in the country, comprising low coral cover and low coral diversity (MNRE, 2013; Sesega, 2014).

It is difficult to predict the health of benthic, invertebrate and fish communities as reefs around Apolima were not surveyed directly and the island is relatively isolated. For example, The State of the Environment 2013 Report suggests a hotspot of fish biomass and density on the "northern coasts of Savaii between Falealupo village and Apolima Strait," but a "low biomass in the Manono/Apolima Strait area" (MNRE, 2013). Furthermore, it was estimated that the general Apolima Strait area was not a hotspot for any of the coral reef variables examined (Kendall and Poti, 2011). The resulting impact on fish biomass on the reefs of Apolima is uncertain.

Type and number of sources (score = 2)

The general sources used to describe coral reefs for Site UI 4: Fagaloa Bay and KBAs for Site UI 7: Five Mile Reef are also relevant here; one peer-reviewed paper and two maps were added to provide some insight about the possibility of upwelling. One report contained information about the general area of Apolima Strait, which may or may not include reefs of this SUMA. Apolima is mentioned briefly in three further reports and the UNESCO-WHC website, albeit primarily pertaining to cultural information.

Obligations (score = 2)

The Fisheries Management Act 2016 provides for the protection of coral reefs and dependent species, and prescribes a precautionary approach for the management of fish stocks and the sustainable use of all aquatic resources. The NBSAP set out the intention to improve coral reef health by 2020. Many species that spend all or part of their life cycle in coral reef ecosystems (see the KBA trigger species list above, especially the bumphead parrotfish (*Bolbometopon muricatum*) and humphead wrasse (*Cheilinus undulatus*)) are on the IUCN Red List of Threatened Species and the Convention on Migratory Species (CMS). The Marine Wildlife Protection Regulations 2009 provide for the protection of marine mammals, turtles, sharks and species of conservation concern, such as those listed on international agreements.

Site UI 9: *Palolo Deep*

Figure 24. Site UI 9: Palolo Deep

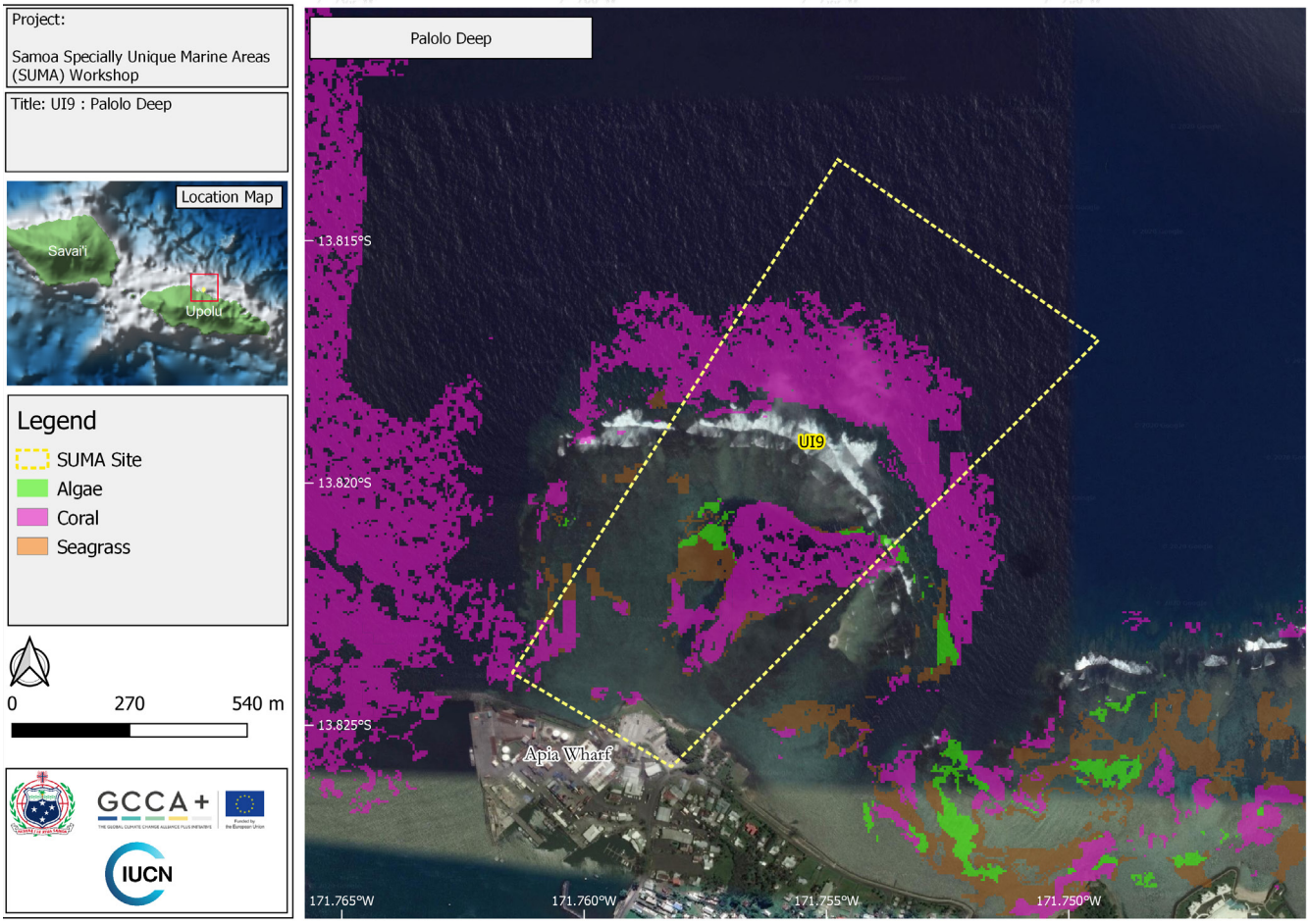
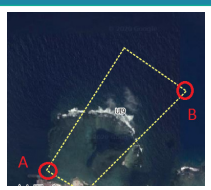


Table 21. Site UI 9: Palolo Deep

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Upolu	Palolo Deep	UI9	11

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	UI9 A	-13.82392007	-171.7614824
	UI9 B	-13.81705288	-171.7493902

Geographic description (score = 3)

Palolo Deep Marine Reserve is a marine protected area (MPA) off the coast of Apia on Upolu Island. The reserve encompasses an area of 137.5 ha comprising the "Deep" (lagoon), a fringing reef and shallow inshore reef flats; it extends seaward to 500 m. The SUMA extends to a kilometre offshore and includes the reserve.

Justification (score = 2)

Palolo Deep National Marine Reserve was established in 1979 as the first MPA managed at a national level in Samoa (Government of Samoa, 1998), and was also the first MPA established by a Pacific Island country (Skelton *et al.*, 2000). The deep coral reef lagoon, as the main feature of the MPA (Zann, 1994), is unique in Samoa, which has mostly narrow fringing reefs (see Site UI 4: Fagaloa Bay for more information on Samoa's coral reefs). Lovell and Toloa provided a detailed description of the reserve in 1994, which they divided into eleven sections. These included reef flat areas surrounding the lagoon, the lagoon itself divided into the "southern" and "main" Palolo Deep, eastern and western algal rims, and a channel, reef crest and slope to the north of the lagoon. It is highly likely this zonation is relevant for driving the community composition of most organisms inhabiting the area, such a variety of habitats is ideal for promoting high biodiversity (Lovell and Toloa, 1994).

Coral cover was approximately 16%, with greater coral species richness closer to the Deep (away from the reef flats). More recently, coral cover was reported to be less than 10%, with low coral richness and medium fish biomass and fish species richness (Kendall and Poti, 2011). In the early 1990s, 108 species of fish were recorded (Lovell and Toloa, 1994). Corals in this SUMA have historically been affected by disturbances such as bleaching (Zann, 1994) and a lack of compliance with the reserve's no-take status (Johannes, 1982). Rapid coral recovery has been documented (Skelton *et al.*, 2000), suggesting a highly resilient area despite the proximity to the major population centre of Apia.

This SUMA was also noted for the diversity of macroalgae. A floristic survey of the reserve's algae revealed a total of 128 species, of which 89 were new records for Samoa, bringing the country's total known marine algae to 360 species (MNRE, 2013). Four species of red algae from Palolo Deep were new to science: *Amansia paloloensis*, *Ceramium upolense*, *Ceramium krameri* and *Ceramium rillfelsianum* (Skelton *et al.*, 2000; Skelton and South, 2002; South and Skelton, 1999). Even some seagrasses (*Halophila* sp.) were recorded at 25 m in the lagoon (Skelton *et al.*, 2000).

Macroalgae are usually cause for concern for coral reefs, as they can replace corals as the dominant benthos during times of stress and disturbance (Cheal *et al.*, 2010). In moderate abundances, however, macroalgae are an integral component of healthy coral reefs, contributing to reef biodiversity, providing food and habitat for numerous species of sessile and mobile invertebrates and recruiting fish larvae (Fulton *et al.*, 2019). Seaweed beds host a rich and diverse invertebrate fauna, which in turn attracts a wide variety of carnivorous fishes (Tano *et al.*, 2016). Macroalgal beds can also act as nurseries for commercially important fishes, such as some *Lethrinus* spp. (Wilson *et al.*, 2017), species of conservation concern such as seahorses (Harasti *et al.*, 2014) and species considered critical for maintaining balance between coral and macroalgal abundance, such as parrotfishes and rabbitfishes (Evans *et al.*, 2014). In this SUMA, macroalgal beds could provide nursery habitat for species that transition to coral-dominated habitats in their adult stages.

Marine protected areas (MPAs) are important tools for the conservation of marine biodiversity, providing refuge for harvested species and mitigating the negative impacts of human activities (Graham *et al.*, 2011). The effectiveness of MPAs has been shown to increase with age, size, isolation and compliance (Edgar *et al.*, 2014); Palolo Deep has been protected for over four decades. The Palolo Deep National Marine Reserve is also a recognised Key Biodiversity Area, noted for the presence of giant grouper (*Epinephelus lanceolatus*) and the corals *Acropora aculeus*, *Acropora aspera*, *Acropora paniculata*, *Pavona decussata* and *Porites nigrescens* (Conservation International, 2010). A species list of corals was compiled in 2004, amounting to 58 species from 24 genera, of which 15 species were, at the time of the surveys, only encountered on this reef (Table 22).

Table 22. Species of corals recorded from Palolo Deep and reported by Lovell (2004). *Note that coral taxonomy is currently under revision resulting in some name. Species found only in Palolo Deep at the time of the surveys are highlighted in bold.*

Family POCILLOPORIDAE
Pocillopora damicornis (Linnaeus, 1758)
Pocillopora eydouxi (Edwards & Haime, 1860)
Pocillopora verrucosa (Ellis & Solander, 1786)
Pocillopora meandrina Dana, 1846
Seriatopora hystrix Dana, 1846
Family ACROPORIDAE
Acropora sp. 1
Acropora sp. 2
Acropora (A.) abrotanoides (Lamarck, 1816)
Acropora (A.) aculeus (Dana, 1846)
Acropora (A.) aspera (Dana, 1846)
Acropora (A.) carduus (Dana, 1846)
Acropora (A.) clathrata (Brook, 1891)
Acropora (A.) cuneata (Brook, 1891)
Acropora (A.) cytherea (Dana, 1846)
Acropora (A.) divaricata (Dana, 1846)
Acropora (A.) gemmifera (Brook, 1892)
Acropora (A.) grandis (Brook, 1892)
Acropora (A.) humilis (Dana, 1846)
Acropora (A.) muricata (Dana, 1846)
Acropora (A.) nasuta (Dana, 1846)
Acropora (A.) paniculata Verrill, 1902
Acropora (A.) robusta (Dana, 1846)
Acropora (A.) samoensis (Brook, 1891)
Acropora (A.) secale (Studer, 1878)
Acropora (A.) valida (Dana, 1846)
Astreopora listeri (Bernard, 1896)
Astreopora myriophthalma (Lamarck, 1816)
Montipora sp. 2
Family AGARICIIDAE
Pachyseris speciosa (Dana, 1846)
Pavona decussata (Dana, 1846)
Pavona maldivensis (Gardiner, 1905)
Pavona varians Verrill, 1864
Leptoseris mycetoseroides Wells, 1954
Family SIDERASTREIDAE
Coscinaraea columna (Dana, 1846)
***Psammocora contigua* Esper 1797**
Psammocora haimeana Milne Edwards & Haime, 1851
Family FUNGIIDAE
Fungia (D.) fungites (Linnaeus, 1758)
Fungia (P.) scutaria Lamarck, 1801
Fungia (V.) repanda Dana, 1846
Herpolitha limax (Houttuyn, 1772)
Family PORITIDAE
Goniopora lobata Milne Edwards & Haime, 1851
***Alveopora alligni* Hoffmeister, 1925**
Porites (P.) cylindrica Dana, 1846
Porites (P.) lobata Dana, 1846
***Porites (P.) nigrescens* Dana, 1846**
Porites (S.) rus (Forskal, 1775)
Family FAVIIDAE
Diploastrea heliopora (Lamarck, 1816)
Favia matthai Vaughan, 1918
Favites halicora (Ehrenberg, 1834)
***Favites flexuosa* (Dana, 1846)**
Leptastrea purpurea (Dana, 1846)
Leptoria phrygia (Ellis & Solander, 1786)
Montastrea curta (Dana, 1846)
Family OCULINIDAE
Galaxea fascicularis (Linnaeus, 1767)
Family MERULINIDAE
Merulina ampliata (Ellis & Solander, 1786)
Family MUSSIDAE
Lobophyllia sp.
Family PECTINIIDAE
Echinophyllia aspera
Oxypora spp.
TOTAL GENERA 24
TOTAL SPECIES 58

A number of giant clams (*Tridacna gigas* and *T. derasa*) were restocked into the reserve from Tonga, and early reports found them to be thriving (SAPA, 2004). Their protection within the reserve could provide important broodstock for replenishing depleted reefs in the surrounding areas. Further information about giant clams in Samoa can be found at Site UI 3: Lufilufi/Faleapuna Community-Based Fish Reserve.

Type and number of sources (score = 3)

The general sources used to describe coral reefs for Site UI 4: Fagaloa Bay, KBAs for Site UI 7: Five Mile Reef, and marine reserves and giant clams for Site UI 3: Lufilufi/ Faleapuna Community-Based Fish Reserve are also relevant here. The status of this SUMA as an existing MPA means that many reports have at least mentioned the reserve in the context of its management and protection. Overall, eleven reports and three peer-reviewed papers were used to describe this SUMA; among these, two provided detailed descriptions of its ecosystems. A further eight peer-reviewed papers were used to provide background on macroalgae and MPAs in general.

Obligations (score = 3)

The Fisheries Management Act 2016 provides for the protection of coral reefs and dependent species, and prescribes a precautionary approach for the management of fish stocks and the sustainable use of all aquatic resources. The NBSAP set out the intention to improve coral reef health by 2020. Many species that spend all or part of their life cycle in coral reef ecosystems (see the KBA trigger species list above, especially the giant grouper *Epinephelus lanceolatus*) are on the IUCN Red List of Threatened Species and the Convention on Migratory Species (CMS). The Marine Wildlife Protection Regulations 2009 provide for the protection of marine mammals, turtles, sharks and species of conservation concern, such as those listed on international agreements.

Site UI 10: *Tiavea mangrove area*

Figure 25. Site UI 10: Tiavea mangrove area

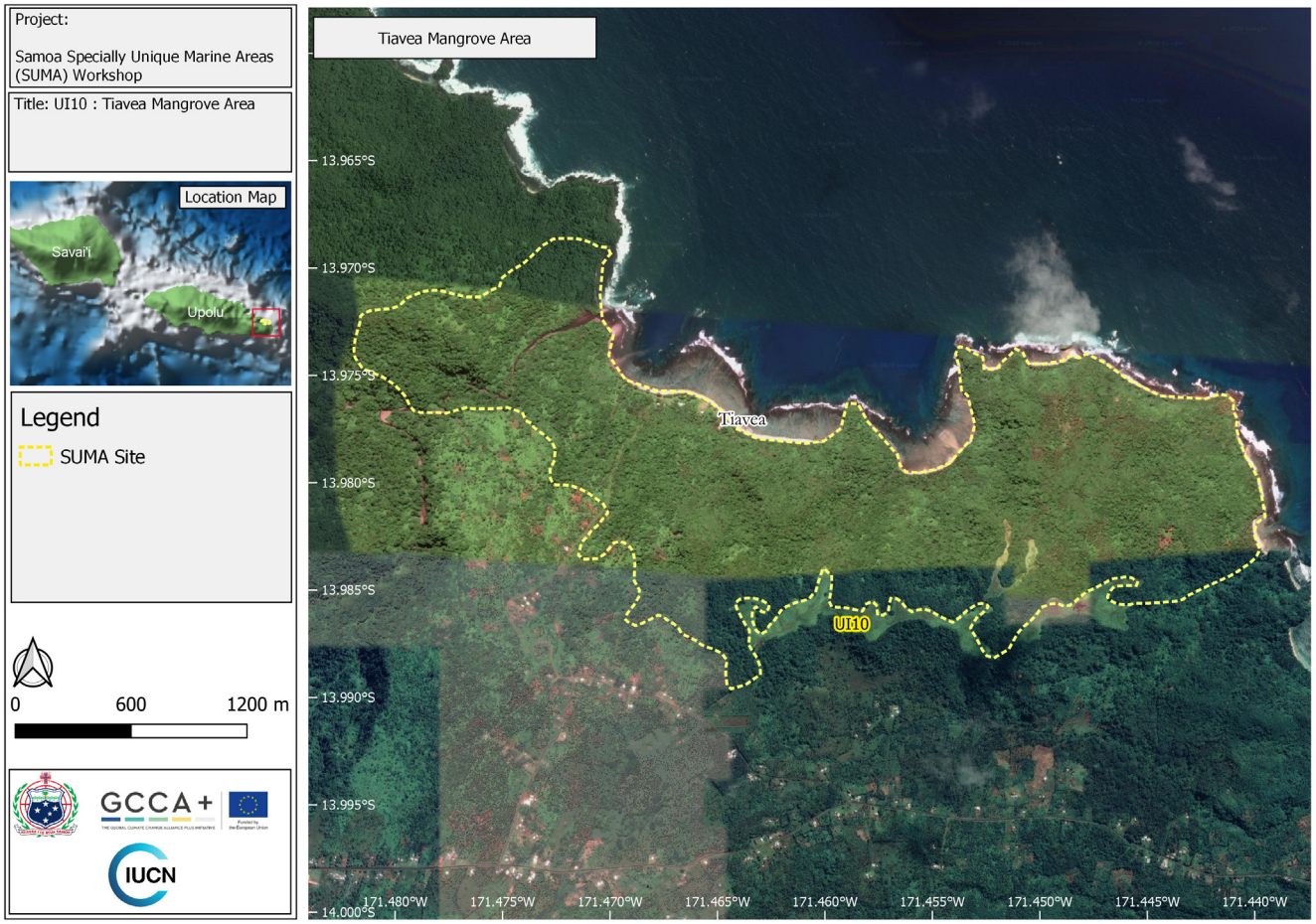


Table 23. Site UI 10: Tiavea mangrove area

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Upolu	Tiavea mangrove area	UI10	4

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	UI10 A	-13.98959223	-171.4643667
	UI10 B	-13.96932233	-171.4699727
	UI10 C	-13.975941	-171.4412523

Geographic description (score = 1)

This SUMA covers approximately 2.5 km^2 of the mangrove forest that fringes the bay at Tiavea, east of Fagaloa Bay on the northern coast of Upolu Island.

Justification (score = 1)

The Tiavea-Uafato Coastal Forest was added to the tentative World Heritage Sites list in 2006. The KBA (Conservation International, 2010) recognised as a priority conservation site in the NBSAP (Sesega, 2014), was chosen by workshop participants for its role in forming a buffer against storms. The general area is subject to a number of threats (deforestation, overharvesting), but the Tiavea forest itself is considered more intact. It is also adjacent to the Aleipata marine protected area (MPA) (MNRE, 2009, 2018a). The connectivity between the mangroves and the lowland rainforest is largely intact (MNRE, 2018a), making this area important for the conservation of birds (MNRE, 2001).

The importance and value of mangroves generally, and particularly in Samoa, are discussed in Site UI 1: Vaiusu Bay mangroves; those values also apply to this SUMA. However, no further information specifically about the Tiavea mangroves was available, as the species that led to the protection of this area are either terrestrial or fully marine (BirdLife International, 2020a; Conservation International, 2010).

Type and number of sources (score = 1)

The sources used to discuss the values of local management of marine resources in general, and particularly in Samoa, in Site UI 1: Vaiusu Bay mangroves are also relevant here. Additionally, five reports and one website mentioned the Tiavea mangroves, but did not provide substantial descriptive information.

Obligations (score = 1)

Although mangroves are not protected under any specific legislation in Samoa, the National Adaptation Programme for Action (NAPA) lists as its second-ranked priority project the reforestation, rehabilitation, and sustainable management of forests, which includes mangrove forests. Conservation and the sustainable use of mangrove areas is also reflected in the overarching vision of Samoa's National Biodiversity Strategy & Action Plan 2015-2020. Other legislation, such as the Fisheries Act 1988, the Forestry Management Act 2011 and the Water Management Regulations 1992, also assist in the management of wetlands (which includes mangroves) and assessments of wetland importance.

The majority of wetlands in Samoa are administered by village councils and individuals (IUCN, 2014); some villages have developed village rules (and related infringements) for mangrove area management and control. These rules are sometimes further translated into by-laws which are recognized nationally at the statutory courts of law (Siamomua-Momoemausu, 2013). The village fisheries by-laws provide for the conservation and management of the local environment, and for the management of community-based fish reserves. Protection measures are underway, such as the Mulinu'u Mangrove Reserve mentioned in the CBD report (Sesega, 2014).

Samoa is a signatory to the Ramsar convention, and some species that spend all or part of their life cycle in mangrove ecosystems are on the IUCN Red List of Threatened Species, the Convention on Migratory Species (CMS), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and protected under the The Marine Wildlife Protection Regulations 2009.

Site UI 11: *Nu'utele and Nu'ulua Bird nesting and foraging area*

Figure 26. Site UI 11: Nu'utele and Nu'ulua bird nesting and foraging area

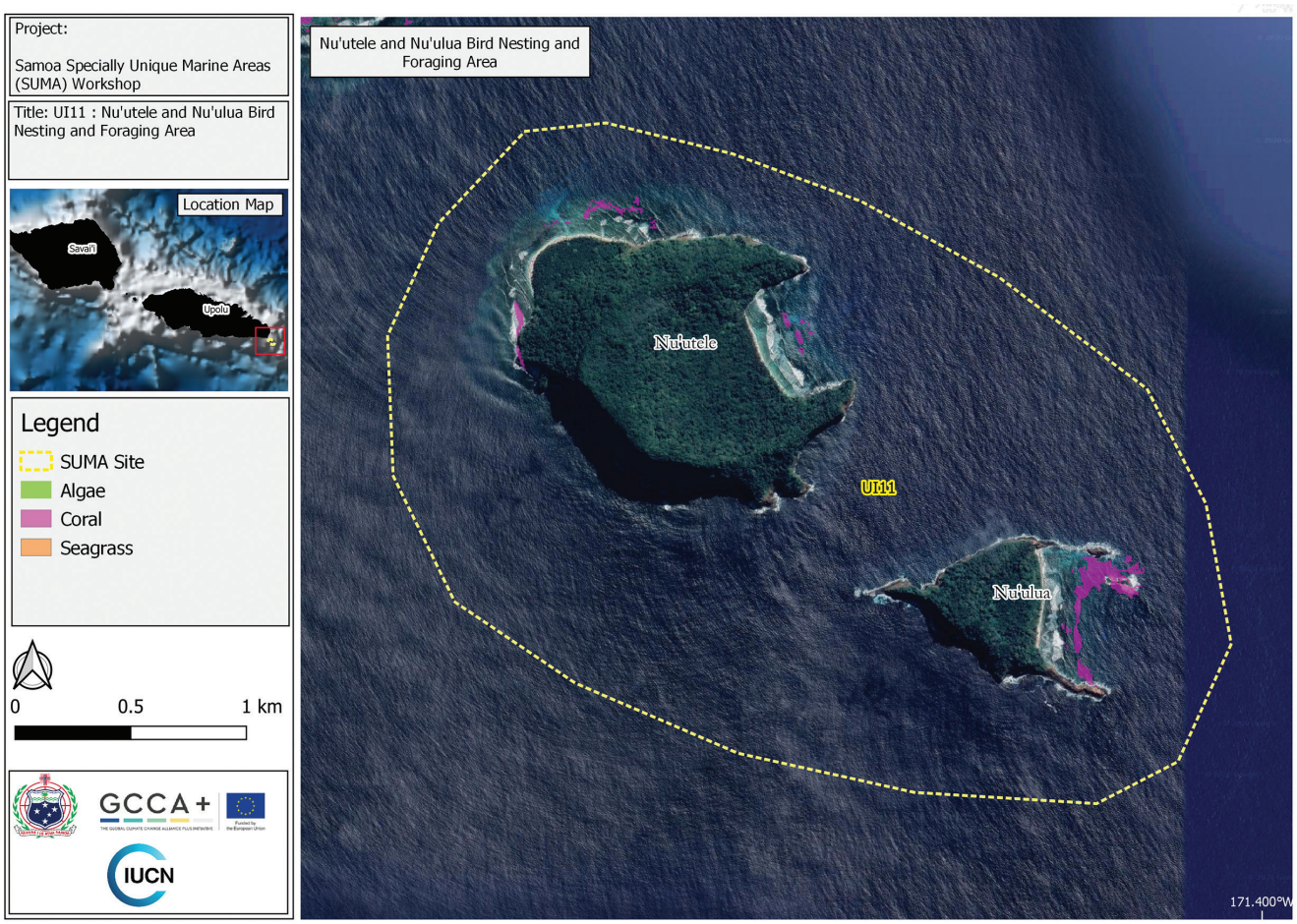
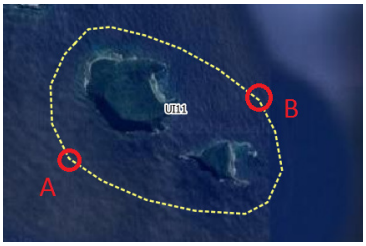
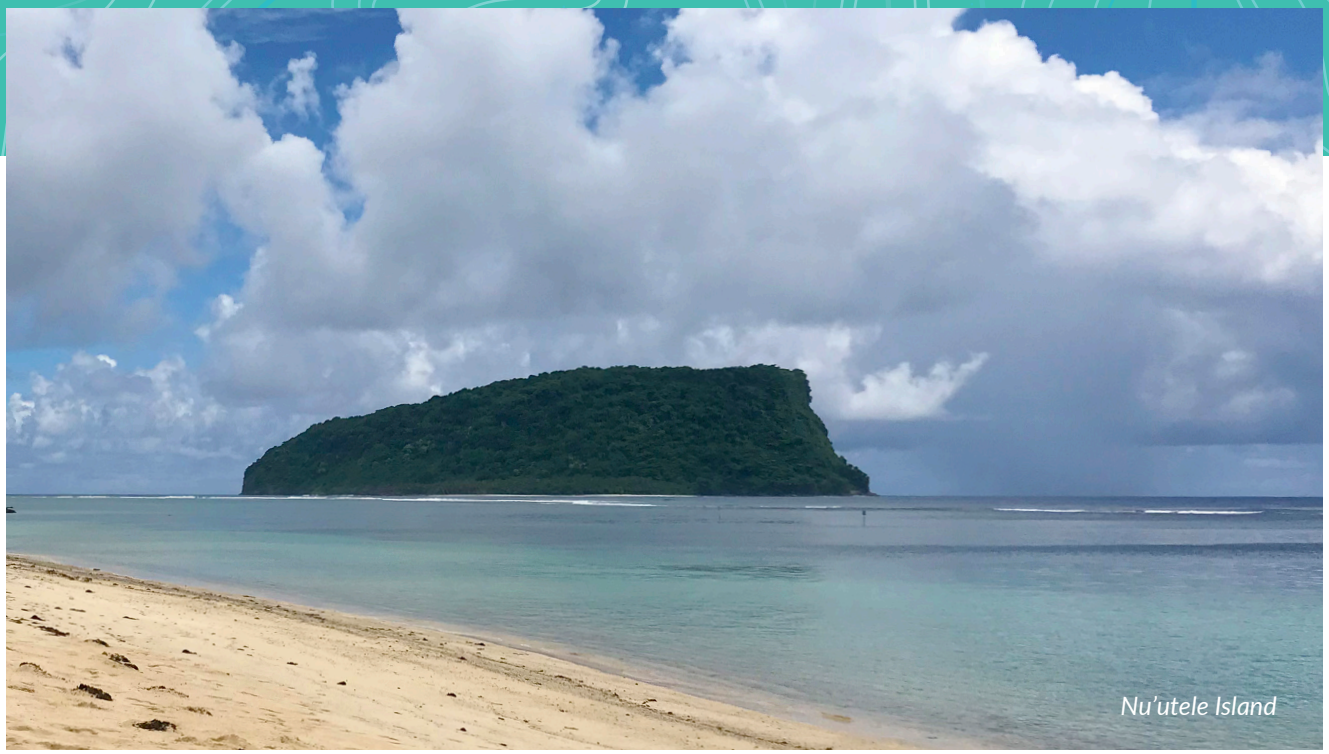


Table 24. Site UI 11: Nu'utele and Nu'ulua bird nesting and foraging area

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Upolu	Nu'utele and Nu'ulua bird nesting and foraging area	UI11	7.5

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	UI11 A	-14.07273854	-171.4313579
	UI11 B	-14.06446423	-171.4044664



Nu'utele Island

Geographic description (score = 2)

The Aleipata Islands are a group of four uninhabited islands off the eastern coast of Upolu Islands. Nu'utele (1.08 km^2) and Nu'ulua (0.25 km^2) are the two southern islands, located at distances of 1.4 km and 3.5 km from Cape Tapaga, the southeastern headland of Upolu. The SUMA includes both islands and the marine habitats immediately surrounding them.

Justification (score = 1.5)

The SUMA and the islands within it are considered important for regional biodiversity and for hosting significant populations of nesting and foraging seabirds. Their relative isolation and lack of human inhabitants, as well as their location within the Aleipata Marine Protected Area (~5,000 ha), established in 2004, afford these ecosystems natural protection (MNRE, 2009). The Aleipata MPA is also designated as a KBA, based on populations of hawksbill and green turtles, bumphead parrotfish, humphead wrasse and coconut crab (*Birgus latro*) (Conservation International, 2010), which are likely to occur in or around the SUMA. Additionally, it is an Important Bird Area (BirdLife International, 2020b). Samoa is known to host 22 species of seabirds; among them is one endangered species, the Polynesian storm-petrel *Nesofregetta fuliginosa* (Table 25). Nine species are known to breed in Samoa (MNRE, 2009).

The two islands hold the highest concentration of nesting seabirds in Samoa, especially the brown booby *Sula leucogaster*, red-footed booby *Sula sula*, black noddy *Anous minutus*, blue noddy *Procelsterna cerulea*, white tern *Gygis alba* and greater frigatebird *Fregata minor* (Butler, 2005; Butler *et al.*, 2011; Serra and Tipama'a, 2016). A comprehensive survey in 2012 recorded 24 species of landbirds, five shorebirds and 13 seabirds across the Aleipata Islands (Parrish and Sherley, 2012). It is thought that Pacific rats have eliminated ground-nesting seabirds from the islands (Butler *et al.*, 2011). Restoration activities that included the eradication of rats and ants on the islands were initiated in 2006 and are thought to have been successful (Tye and Butler, 2013). Generally, reports that mention seabirds in Samoa highlight their populations as an important knowledge gap (MNRE, 2013; Sesega, 2014).

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). The feeding and breeding activities of seabirds, which are top predators in many parts of the ocean where they forage, 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. Those 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 (Thaxter *et al.*, 2012), including the intertidal reef flats around the islands (BirdLife International, 2020b).

Table 25. Seabirds of Samoa; species known to frequent this SUMA are highlighted in bold. From Conservation International (2008) and Parrish and Sherley (2012). Classifications on threatened species lists are added, including the IUCN Red List of Threatened Species. NT: Near Threatened; EN: Endangered; LC: Least Concern.

Species name	Common Name	Samoan Name	Classifications	Breeding Status
Pseudobulweria rostrata	Tahiti petrel	Ta'i'o	NT	
Ardenna pacifica	**Wedge-tailed shearwater**	**Ta'i'o**	**LC**	
Ardenna tenuirostris	Short-tailed shearwater	Ta'i'o	LC	
Puffinus lherminieri	**Audubon's shearwater**	**Ta'i'o**	**LC**	
Puffinus griseus	Sooty shearwater	Ta'i'o		
Nesofregetta fuliginosa	Polynesian storm-petrel	Ta'i'o	EN	
Phaethon rubricauda	Red-tailed tropicbird	Tava'e'ula	LC	
Phaethon lepturus	**White-tailed tropicbird**	**Tava'e**	**LC**	
Sula dactylatra	**Masked booby**	**Fua'o**	**LC**	
Sula leucogaster	**Brown booby**	**Fua'o**	**LC**	**Breeding**
Sula sula	**Red-footed booby**	**Fua'o**	**LC**	**Breeding**
Fregata minor	**Great frigatebird**	**Atafa**	**LC**	**Breeding**
Fregata ariel	**Lesser frigatebird**	**Atafa**	**LC**	
Stercorarius pomarinus	Pomarine skua		LC	
Thalasseus bergii	Greater crested tern	Gogo	LC	
Sterna sumatrana	Black-naped tern	Gogo	LC	
Onychoprion fuscatus	Sooty tern	Gogo	LC	
Onychoprion anaethetus	**Bridled tern**	**Gogo Uli**	**LC**	
Anous ceruleus	**Blue noddy**	**Laia**	**LC**	
Anous stolidus	**Brown noddy**	**Gogo**	LC	**Breeding**
Anous minutus	**Black noddy**	**Gogo**	**LC**	
Gygis alba	**Common white tern**	**Manusina**	**LC**	

Type and number of sources (score = 3)

This SUMA benefited from research conducted specifically on the values for which it was chosen (seabirds). One peer-reviewed paper, three reports and one website provided information about seabirds of the Aleipata Islands. An additional report contained information about pest eradication on the islands. Seabirds in general were discussed using two peer-reviewed papers and one report, and the Aleipata MPA is mentioned in a large number of reports, of which four were used to describe this SUMA.

Obligations (score = 1)

Seabirds are protected under the Marine Wildlife Protection Regulations 2009, the Trade in Endangered Species Bill 2013 and the Fisheries Regulation 1996. They are also listed on the IUCN Red List of Threatened Species, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Site UI 12: *Mutiatele mangrove area*

Figure 27. Site UI 6: Manono Reef Flats

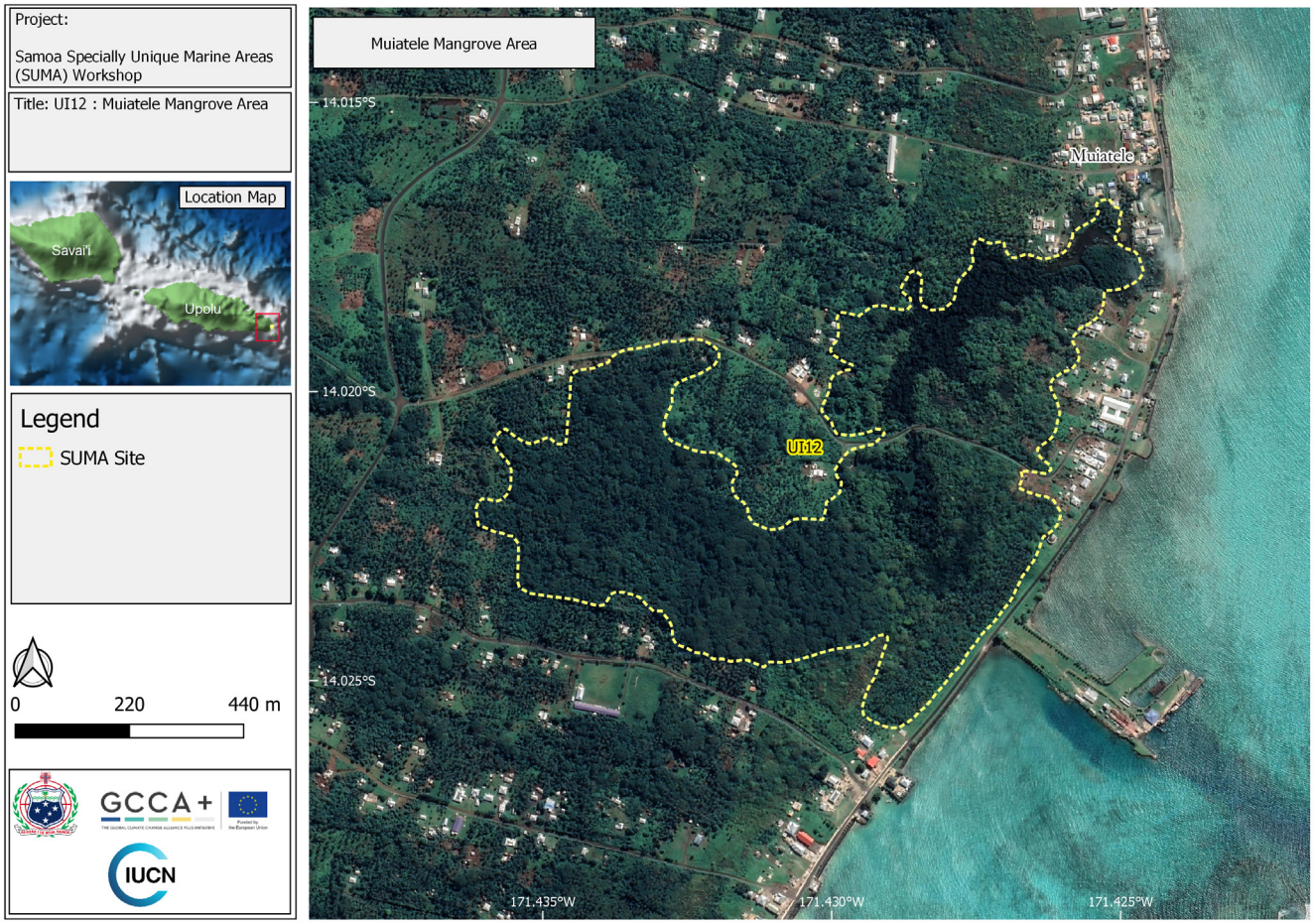


Table 26. Site UI 12: Mutiatele mangrove area

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Upolu	Mutiatele mangrove area	UI12	4

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	UI12 A	-14.02234756	-171.4360122
	UI12 B	-14.01667258	-171.425193
	UI12 C	-14.02580766	-171.4288266

Geographic description (score = 1)

Mutiatele is located on the eastern tip of Upolu Island. The SUMA is south of the village and encompasses a creek and an area of intact mangrove forest of approximately 47 ha.

Justification (score = 1)

The importance and value of mangroves generally, and particularly in Samoa, are discussed in Site UI 1: Vaiusu Bay mangroves. Those values also apply to this SUMA. Further information specifically about the Mutiatele mangroves was not available.

Type and number of sources (score = 1)

The sources used to discuss the values of local management of marine resources in general, and particularly in Samoa, in Site UI 1: Vaiusu Bay mangroves are also relevant here. Further sources specifically about this SUMA were not available.

Obligations (score = 1)

Although mangroves are not protected under any specific legislation in Samoa, the National Adaptation Programme for Action (NAPA) lists as its second-ranked priority project the reforestation, rehabilitation, and sustainable management of forests, which includes mangrove forests. Conservation and the sustainable use of mangrove areas is also reflected in the overarching vision of Samoa's National Biodiversity Strategy & Action Plan 2015-2020. Other legislation, such as the Fisheries Act 1988, the Forestry Management Act 2011 and the Water Management Regulations 1992, also support the management of wetlands, which includes mangroves, and assessments of wetland importance.

The majority of wetlands in Samoa are administered by village councils and individuals (IUCN, 2014). Some villages have developed village rules and related infringements for mangrove area management and control that are sometimes further translated into by-laws recognized nationally at the statutory courts of law (Siamomua-Momoemausu, 2013). The village fisheries by-laws provide for the conservation and management of the local environment, and management of community-based fish reserves. Protection measures are underway, such as the Mulinu'u Mangrove Reserve mentioned in the CBD report (Sesega, 2014). Samoa is a signatory to the Ramsar convention, and some species that spend all or part of their life cycle in mangrove ecosystems are on the IUCN Red List of Threatened Species, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and protected under the The Marine Wildlife Protection Regulations 2009.

Site UI 13: *Tuialamu Palolo site*

Figure 28. Site UI 13: Tuialamu Palolo site

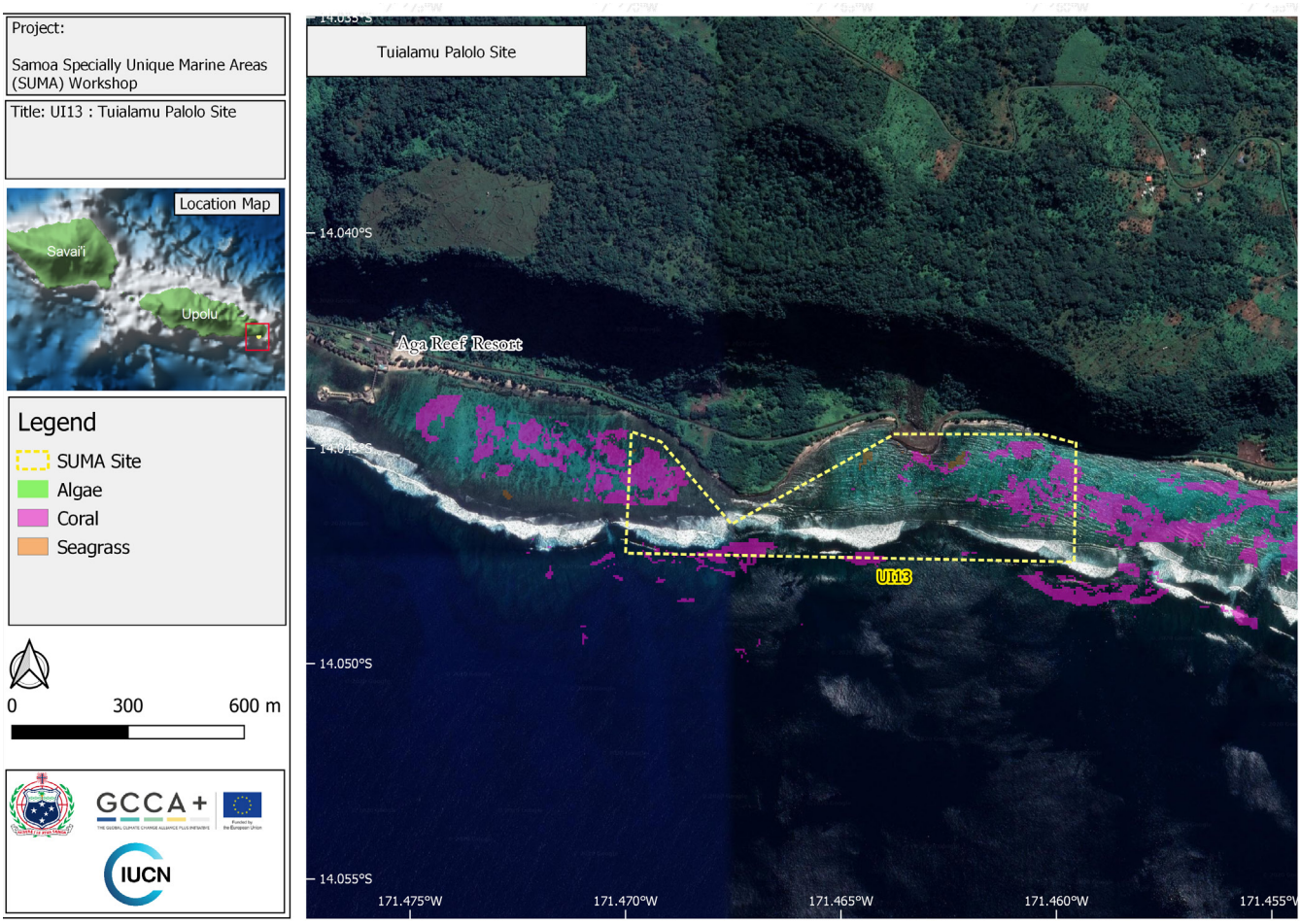


Table 27. Site UI 13: Tuialamu Palolo site

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Upolu	Tuialamu Palolo site	UI13	5

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	UI13 A	-14.04743588	-171.4700009
	UI13 B	-14.04488574	-171.4595436

Geographic description (score = 1)

This SUMA is a stretch of reef on the southern coast of Upolu Island, extending for 3 km along the coast and approximately 300 m out to sea.

Justification (score = 1.5)

This area is known to be a spawning site of the palolo worm (Palola viridis), a highly sought-after delicacy in Samoa (Tupufia, 2019). Palolo worms are subject to heavy exploitation levels in Samoa (Government of Samoa, 1998), and have therefore experienced sharp declines due to overharvesting (Lafoai, 2016; Zann, 1999). The worms reproduce in mass spawning events that occur at night October to November; the terminal parts of the paolo's bodies (epitokes) detach and swarm over the surface of the water ("palolo rising"), releasing sperm and eggs (Schulze and Timm, 2012). The spawning is said to coincide with the third quarter moon phase (7th night after the full moon) and the low or outgoing tide, synchronous with coral spawning (Brown, 2009; Kendall and Poti, 2011). The swarming attracts an abundance of marine life considered a productive time for fishing (Skelton *et al.*, 2000).

Palolo spawning sites usually coincide with highly productive coral reef areas. Tuialamu is one of the regular palolo monitoring sites, suggesting that spawning occurs here on a predictable basis. However, this area has also been subject to the declines experienced elsewhere (MAF, 2018). Coral cover was recently recorded as very low in this area (< 10%), and the reef was dominated by turf and coralline algae (Seinor *et al.*, 2020).

Type and number of sources (score = 1.5)

Sources used to justify this SUMA include one website, four reports and two peer-reviewed papers describing the biology and importance of the palolo worm in Samoa. Additionally, one report named this SUMA as a "palolo rising" monitoring site, and one peer-reviewed paper contained some information about the benthos on the ree

Obligations (score = 1)

The Fisheries Regulation 1996 provides for the sustainable harvest of marine species, including palolo worms, which are listed as Data Deficient on the IUCN's Red List of Threatened Species. The village fisheries' by-laws provide for the conservation and management of the local environment.

Site UI 14: *Salani-Poutasi reefs*

Figure 29. Site UI 14: Salani-Poutasi reefs

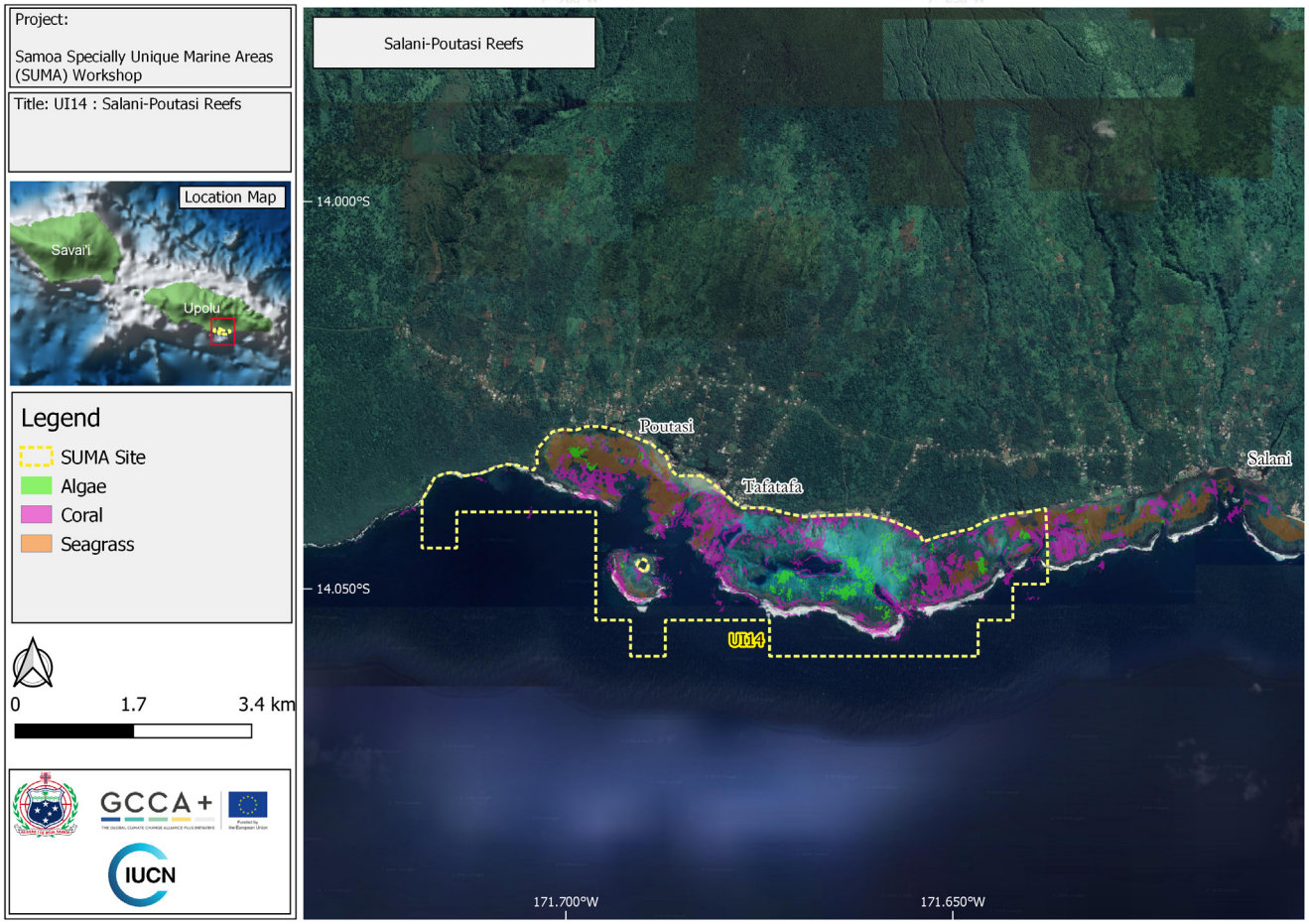


Table 28. Site UI 14: Salani-Poutasi reefs

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Upolu	Salani-Poutasi reefs	UI14	5

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	UI14 A	-14.044739	-171.718598
	UI14 B	-14.03963409	-171.638001

Geographic description (score = 1)

A complex and extensive reef system with a network of channels and lagoons lies between Salani and Poutasi villages, on the southern side of Upolu Island. Around 1 km offshore of Vaovai, the barrier reef is cut by two broad channels that are linked to streams on shore. The lagoon varies in width from 300 m to 450 m, but rapidly disappears on the east side of Nu'usafee island. The SUMA contains the reefs along 9 km of coastline, extending up to 1.5 km out to sea.

Justification (score = 1.5)

This SUMA was chosen because of its coral reef, which is extensive and complex compared with many of the fringing reefs around Samoa. The coral reefs in this area have suffered from repeated disturbances, including the 2009 tsunami, but subsequent assessments found a high coral cover and intermediate coral richness, unlike sites in northern Upolu (Bell *et al.*, 2012; Kendall and Poti, 2011). Although the biomass of reef fishes was low, fish richness was medium to high. Surveys at a site near Poutasi village revealed a history of relatively high species richness, biomass and density of coral reef fishes (Green, 1996). The coral and fish communities around this SUMA were found to have more similarities with the healthier coral reefs on the northern side of Savai'i Island, than with those in other parts of Upolu (Kendall and Poti, 2011).

Surveys conducted after the 2009 tsunami reported remarkable resistance to mechanical damage, with coral cover still ~50% across the reef flat in 2010, despite the substantial evidence of coral destruction on the back reef of the Vaovai lagoon (McAdoo *et al.*, 2011). More recent surveys confirmed this, with an estimate of 56% coral cover and a dominance of branching Acropora spp. on the reef flat at Vaovai in 2018 (Tone, 2018). Such results also suggest that the lagoon and reef flat are adequately sheltered from wave action. Similarly, the Poutasi Fish Reserve exhibited a very rapid recovery of coral cover, from 15% in 2010 to >70% in 2017 (Aiafi, 2017c, 2013). The fish community was typical of Pacific reef flat assemblages (Aiafi, 2017c, 2013; Bell *et al.*, 2012; Tone, 2018). The reef crest, which may have suffered the brunt of physical damage, was dominated by turf and coralline algae, with very low (8.6%) coral cover (Seinor *et al.*, 2020). Further information about the value and status of coral reefs in Samoa is provided in Site UI 4: Fagaloa Bay.

Type and number of sources (score = 1.5)

Sources used to describe coral reefs in Samoa for Site UI 4: Fagaloa Bay were also relevant to this SUMA, as well as information derived from six reports and two peer-reviewed papers.

Obligations (score = 1)

The Fisheries Management Act 2016 provides for the protection of coral reefs and dependent species and prescribes a precautionary approach for the management of fish stocks and the sustainable use of all aquatic resources. The NBSAP set out the intention to improve coral reef health by 2020. Many species that spend all or part of their life cycle in coral reef ecosystems are on the IUCN Red List of Threatened Species, the Convention on Migratory Species (CMS), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and protected under the Marine Wildlife Protection Regulations 2009. The village fisheries by-laws provide for the conservation and management of the local environment, and for the management of community-based fish reserves.

Site UI 15: *Safata MPA*

Figure 30. Site UI 15: Safata MPA

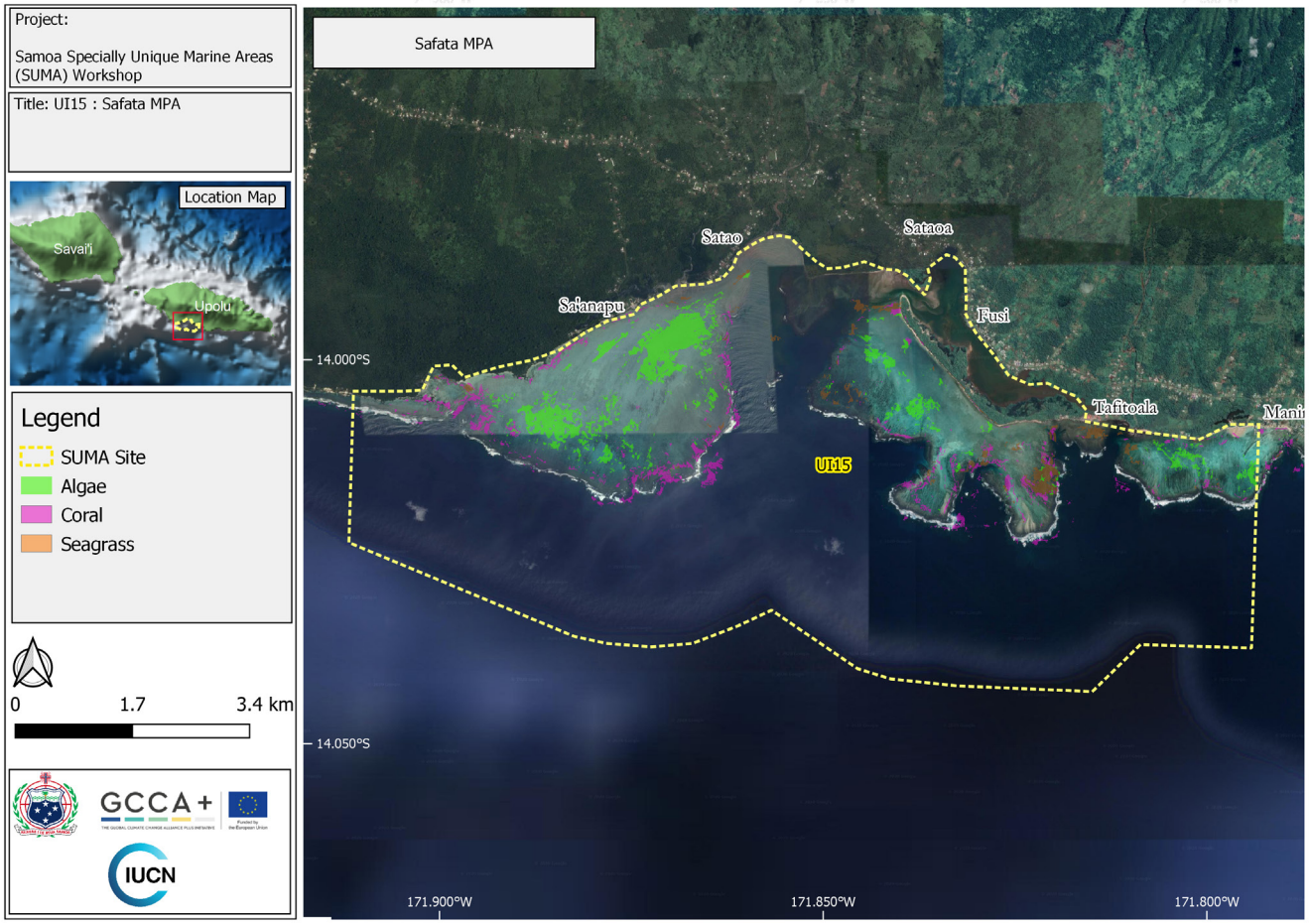


Table 29. Site UI 15: Safata MPA

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Upolu	Safata MPA	UI15	7

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	UI15 A	-14.02381507	-171.9118142
	UI15 B	-14.00842766	-171.7932172

Geographic description (score = 3)

This SUMA is the Safata MPA, an area of 6,370 ha on the southern coast of Upolu Island. The SUMA contains the entire MPA between the villages of Salamumu and Maninoa, approximately 5 km out to sea including the Aau Gasese submerged reef.

Justification (score = 1.5)

The Safata was declared a MPA in 1999 and its stewardship is shared among nine communities; 10% of the MPA is no-take (CRISP, 2008; MNRE, 2009). All decisions for the MPA are made by the Safata MPA District Committee located at Lotofaga (MNRE, 2002). The MPA has also been listed as a KBA, due to its populations of bumphead parrotfish and humpheaded wrasse (Conservation International, 2010). Management practices range from the banning of destructive fishing and the removal of crown-of-thorns starfish, to the restocking of giant clams and trochus (CRISP, 2008).

The coral reefs in this area are recovering from repeated disturbances, including the 2009 tsunami, but in a 2011 assessment they exhibited high coral cover and intermediate coral richness, unlike sites in northern Upolu (Kendall and Poti, 2011). The coral communities around this SUMA were more similar to the healthier coral reefs on the northern side of Savai'i Island (Kendall and Poti, 2011). Recent surveys in the protected lagoon and on the reef flat at the western edge of the MPA recorded ~60% coral cover, the highest of all surveyed sites on Upolu (Aiafi and Sapatu, 2013; Ziegler *et al.*, 2018). Species of fish and invertebrates were also recorded in relatively high numbers (Aiafi and Sapatu, 2013). A different survey along the reef crests, however, showed approximately 9% coral cover compared to approximately 30% turf and coralline algae cover (Seinor *et al.*, 2020), indicative of a high-disturbance regime and a spatially variable distribution of healthy and degraded patches of reef.

The MPA is thought to provide feeding habitat for hawksbill and green turtles (MNRE, 2013). Fisheries catch data show this area as having a productive history (Zann and Mulipola, 1995), whereas surveys at Sa'anapu showed relatively low fish density, biomass and species richness (Green, 1996). Further information about the value and status of coral reefs in Samoa is provided in Site UI 4: Fagaloa Bay, and turtles in Samoa are discussed in Site SI 1: Northwest Savai'i.

Type and number of sources (score = 1.5)

Sources used to describe coral reefs and turtles in Samoa for Site UI 4: Fagaloa Bay and Site SI 1: Northwest Savai'i are also relevant to this SUMA, as well as seven reports and two peer-reviewed papers. A number of reports mentioned the MPA (e.g. the NBSAP) without providing detailed information.

Obligations (score = 1)

The Fisheries Management Act 2016 provides for the protection of coral reefs and dependent species, and prescribes a precautionary approach for the management of fish stocks and the sustainable use of all aquatic resources. The NBSAP intends to improve coral reef health by 2020. Many species that spend all or part of their life cycle in coral reef ecosystems (including the KBA trigger species, the bumphead parrotfish *Bolbometopon muricatum* and humphead wrasse *Cheilinus undulatus*) are on the IUCN Red List of Threatened Species, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The village fisheries by-laws provide for the conservation and management of the local environment, and for the management of community-based fish reserves.

SAVAI'I
Island

Site SI 1: *Northwest Savai'i*

Figure 31. Site SI 1: Northwest Savai'i

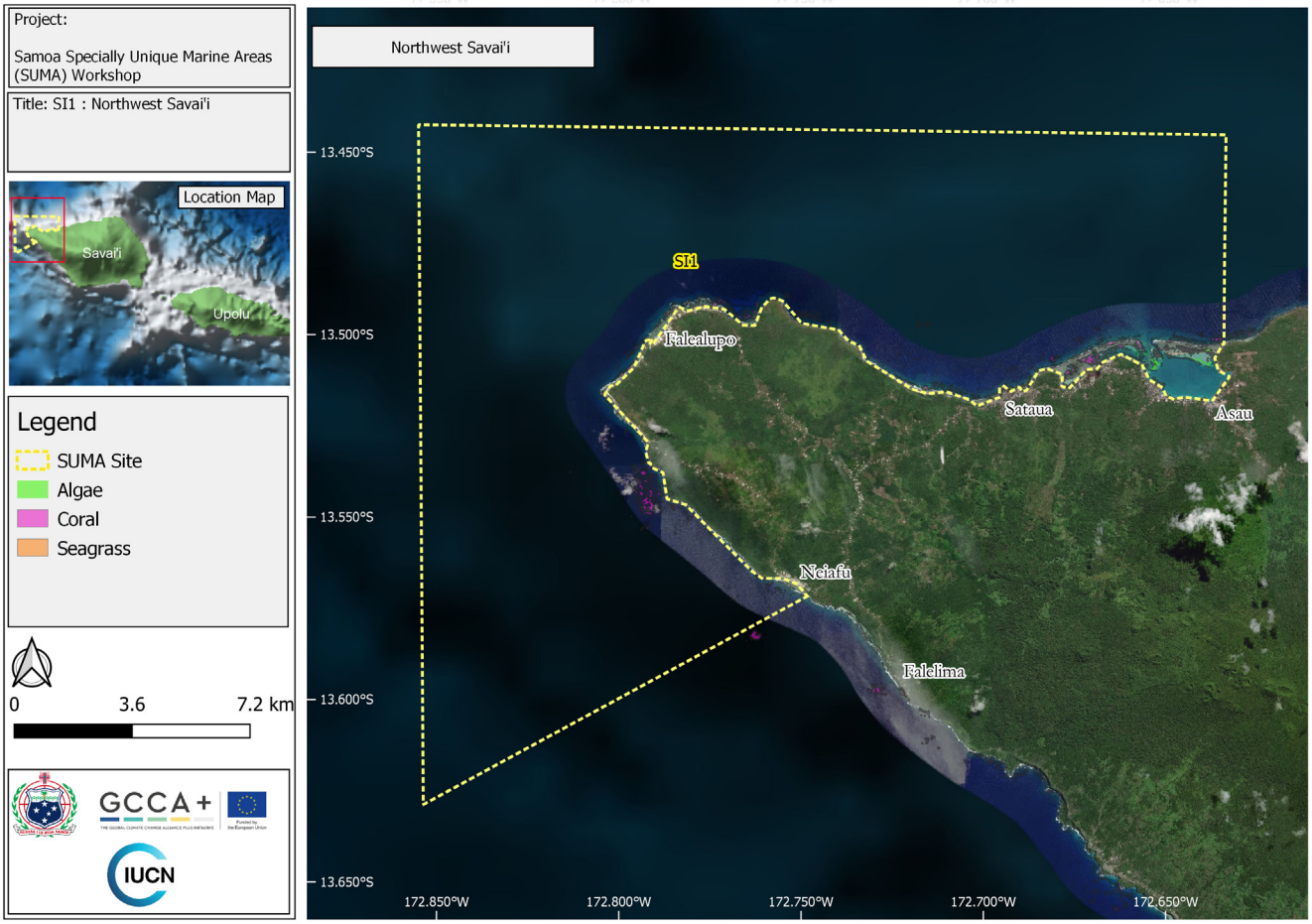


Table 30. Site SI 1: Northwest Savai'i

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Savai'i	Northwest Savai'i	SI1	10

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	SI1 A	-13.62881745	-172.853631
	SI1 B	-13.44523071	-172.633425

Geographic description (score = 1)

This SUMA is a marine area off the northwestern tip of Savai'i Island. Its outer boundaries are approximately 10km offshore from Falelima, Falealupo and Asau, creating an area of roughly 270 km^2.

Justification (score = 3)

The sea off the northwestern tip of Savai'i is known for the diversity and genetic distinctiveness of marine mammals, resident populations of rough-toothed dolphins and spinner dolphins, high coral cover and palolo worms. The Falealupo Conservation Area protects terrestrial habitats across half of the peninsula. The SUMA contains the Vaotupua Key Biodiversity Area, which was selected for the nesting of hawksbill turtles (Conservation International, 2010). Falealupo, Fagasa and Auala also have community-based fish reserves (King and Fa'asili, 1999) where destructive fishing and rubbish dumping are banned, some gear and catch restrictions apply, crown-of-thorns starfish are removed and giant clams have been restocked (King and Faasili, 1999); Vaisala fish reserve is also situated within the SUMA site (Aiafi, 2017d).

Samoan waters have been declared an Important Marine Mammal Area (IMMA) due to the resident populations of spinner dolphins *Stenella longirostris* and rough-toothed dolphins *Steno bredanensis* (Government of Samoa, 1998) as well as the general diversity of marine mammals (Marine Mammal Protected Areas Taskforce, 2020). Information, including a list of Samoa's marine mammal species, is presented in Site O 6: Whale migration route. Overall, observation records from this area include spinner dolphins, rough-toothed dolphins, short-finned pilot whales, Blainville's beaked whales, sperm whales, humpback whales and other, unidentified, cetaceans (MNRE, 2013; Ward *et al.*, 2010). Samoa's EEZ was declared a sanctuary for dolphins, whales, sharks and turtles in 2002 (MNRE, 2019, 2015; Sesega, 2014).

The spinner dolphin is the most abundant species, thought to be increasing, and often present in groups of 100 or more (MNRE, 2013). The waters of this SUMA had a high concentration of dolphin sightings between 2001 and 2010, especially spinner dolphins which appear to favour this area of the Samoan EEZ. Genetic studies on rough-toothed dolphins have found that despite their primarily oceanic habitat preferences, these marine mammals can form isolated insular populations in areas with increased local productivity (Albertson, 2014; Albertson *et al.*, 2017). The high residency level of spinner and rough-toothed dolphins, both within and between years, suggests this habitat is probably used for breeding. Very young (e.g. nursing) sperm whales, pilot whales and Cuvier's beaked whales have also been documented in Samoan waters (Marine Mammal Protected Areas Taskforce, 2020).

The coral reefs of northwestern Savai'i, including those within this SUMA, are among the healthiest in Samoa (MNRE, 2013). General information about coral reefs and their status in Samoa is reviewed for Site UI 4: Fagaloa Bay. In the past, Savai'i Island has exhibited higher coral cover that Upolu Island, with island-wide estimates of almost 50% (Lovell *et al.*, 2008); Savai'i was also considered a hotspot for a number of coral reef variables, such as fish biomass (Kendall and Poti, 2011). A biogeographic assessment deemed the northern part of the SUMA different from the southern section whereby coral cover was higher on the northern reefs than the southern reefs, and coral species composition differed (Kendall and Poti, 2011).

Assessments of fish reserves documented coral cover of around 50% on the reef flat (Aiafi, 2018b; Tanielu, 2015a, 2018b; Tiitii *et al.*, 2017). Additionally, *Kyphosus* spp., or drummers, which are among the few reef fishes that consume macroalgae, and the black teatfish *Holothuria whitmaei*, a high-value sea cucumber that has been heavily depleted elsewhere, were recorded (Aiafi, 2018b). Surveys in the Vaisala, Auala, Asau and Sataua fish reserves on the northern side of the SUMA consistently documented high coral cover (40 -75%) on the reef flat between 2007 and 2017, and high fish species richness in 2015 and 2017 even in shallow intertidal areas (Aiafi, 2017d, 2015b). The most recent coral reef surveys found an average coral cover of 16.5% on the northern reef crest, and 30% cover of turf algae and coralline algae (Seinor *et al.*, 2020).

This SUMA is an important palolo spawning site; however, recent years have seen marked declines in palolo everywhere (MAF, 2018). Information about the palolo worm, its biology and importance, is reviewed in Site UI 13: Tuialamu Palolo Site.

The western tip of Savai'i Island is potentially an important site for the nesting of hawksbill turtles in Samoa (Conservation International, 2010); the country's waters are a designated sanctuary for turtles (Sesega, 2014). Three species of turtles have been recorded in Samoan waters: hawksbill (*Eretmochelys imbricata*), green (*Chelonia mydas*)

and leatherback (*Dermochelys coriacea*) turtles. Hawksbill and green turtles are relatively common (Witzell, 1982), while leatherback turtles are rare (MNRE, 2013). Only the hawksbill turtle is known to nest on Samoan beaches. Although green turtles and leatherback turtles forage in the nearshore waters, nests have not been detected. The nesting season is from September to July (Witzell and Banner, 1980). The most recent surveys, which are from the early 2000s, showed declining numbers of nesting hawksbill turtles (MNRE, 2013).

Type and number of sources (score = 3)

Sources that contained general information about marine mammals, palolo worms, community-based fish reserves, KBAs and marine mammals, globally and in Samoa, were those used for Site O 6: Whale migration route, Site UI 13: Tuialamu Palolo site, Site UI 3: Lufilufi/Faleapuna Community-Based Fish Reserve, Site UI 7: Five Mile Reef and Site UI 4: Fagaloa Bay. Sources used for values specific to this SUMA included a thesis, eight reports and three peer-reviewed papers on dolphins and turtles in Samoan waters. One report yielded information about coral reefs specific to Savai'i Island. Marine mammals, coral reefs and community-based fish reserves in the SUMA were mentioned or described in one website, four reports and three peer-reviewed papers.

Obligations (score = 3)

Species in this SUMA are protected under the Marine Wildlife Protection Regulations 2009, the Trade in Endangered Species Bill 2013 and the Fisheries Regulation 1996. The village fisheries by-laws provide for the conservation and management of the local environment, and for management of community-based fish reserves. Palolo worms are listed as Data Deficient on the IUCN's Red List. Marine mammals found in this SUMA, hawksbill turtles and a number of species that frequent coral reefs are on the IUCN Red List of Threatened Species, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Site SI 2: *Faletagaloa mangroves*

Figure 32. Site SI 2: Faletagaloa mangroves

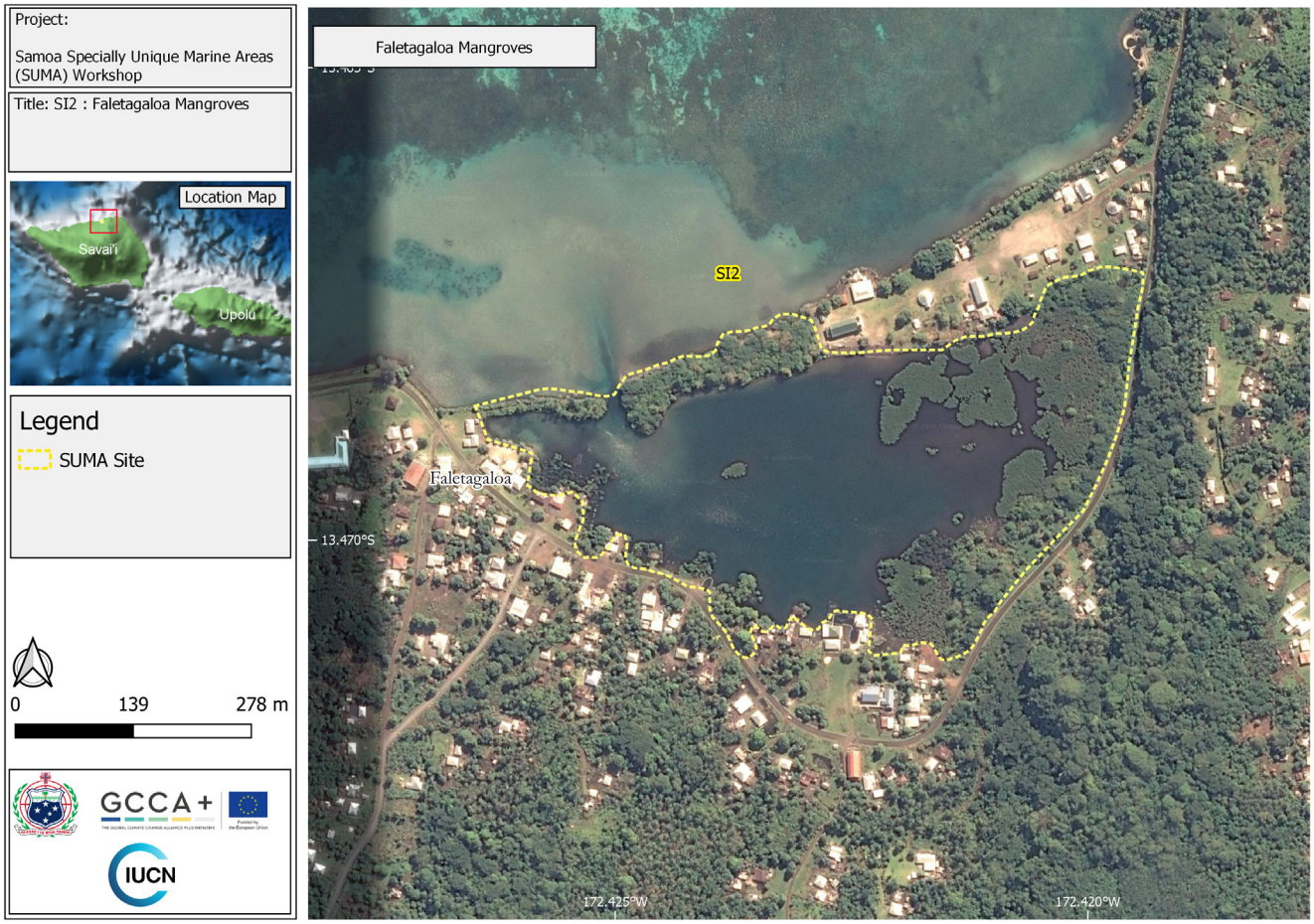


Table 31. Site SI 2: Faletagaloa mangroves

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Savai'i	Faletagaloa mangroves	SI2	5.5

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	SI2 A	-13.47051933	-172.4240294
	SI2 B	-13.46716801	-172.4194162

Geographic description (score = 2)

This SUMA is a small lagoon (0.25 km²), with a narrow passage to the reef flat on the northern side, fringed by mangroves. It is adjacent to Faletagaloa village on the northern coast of Savai'i Island.

Justification (score = 1)

The lagoon and surrounding mangroves are a rich and productive breeding and nursery area for species of conservation and fisheries significance, such as shellfish. General information about the values of mangroves in Samoa is presented for Upolu Island in Site UI 1: Vaiusu Bay mangroves. As suggested by the catch per unit effort of villages in mangrove areas (Passfield *et al.*, 2001), the mangroves provide habitat for a rich variety of food species, indicating high productivity. A biodiversity audit found that the mangroves in this SUMA need protection and replanting (Government of Samoa, 2007, 2017a), as they are showing signs of saltwater intrusion (MNRE, 2018b). The enclosed lagoon is a unique environment among Samoan mangroves and may host some different species compared to coastal mangroves elsewhere in the country, though the extent of this is unknown.

Type and number of sources (score = 1.5)

Sources that contain general information about Samoan mangroves used for Site UI 1: Vaiusu Bay mangroves are also relevant here. The mangroves in this SUMA are mentioned, but not described, in four reports.

Obligations (score = 1)

Although mangroves are not protected under any specific legislation in Samoa, the National Adaptation Programme for Action (NAPA) lists as its second-ranked priority project the reforestation, rehabilitation, and sustainable management of forests, which includes mangrove forests. Conservation and the sustainable use of mangrove areas is also reflected in the overarching vision of Samoa's National Biodiversity Strategy & Action Plan 2015-2020. Other legislation, such as the Fisheries Act 1988, the Forestry Management Act 2011 and the Water Management Regulations 1992 also assist in the management of wetlands (which includes mangroves) and assessments of wetland importance. The majority of wetlands in Samoa are administered by village councils and individuals (IUCN, 2014).

Some villages have developed village rules (and related infringements) for mangrove area management and control that are sometimes further translated into by-laws recognized nationally at the statutory courts of law (Siamomua-Momoemausu, 2013). Protection measures are underway, such as the Mulinu'u Mangrove Reserve mentioned in the CBD report (Sesega, 2014). Samoa is a signatory to the Ramsar convention, and some species that spend all or part of their life cycle in mangrove ecosystems are on the IUCN Red List of Threatened Species, the Convention on Migratory Species (CMS), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and protected under the Marine Wildlife Protection Regulations 2009.

Site SI 3: *Safotu, Sasina and Safune Palolo harvesting areas*

Figure 33. Site SI 3: Safotu, Sasina and Safune Palolo harvesting areas

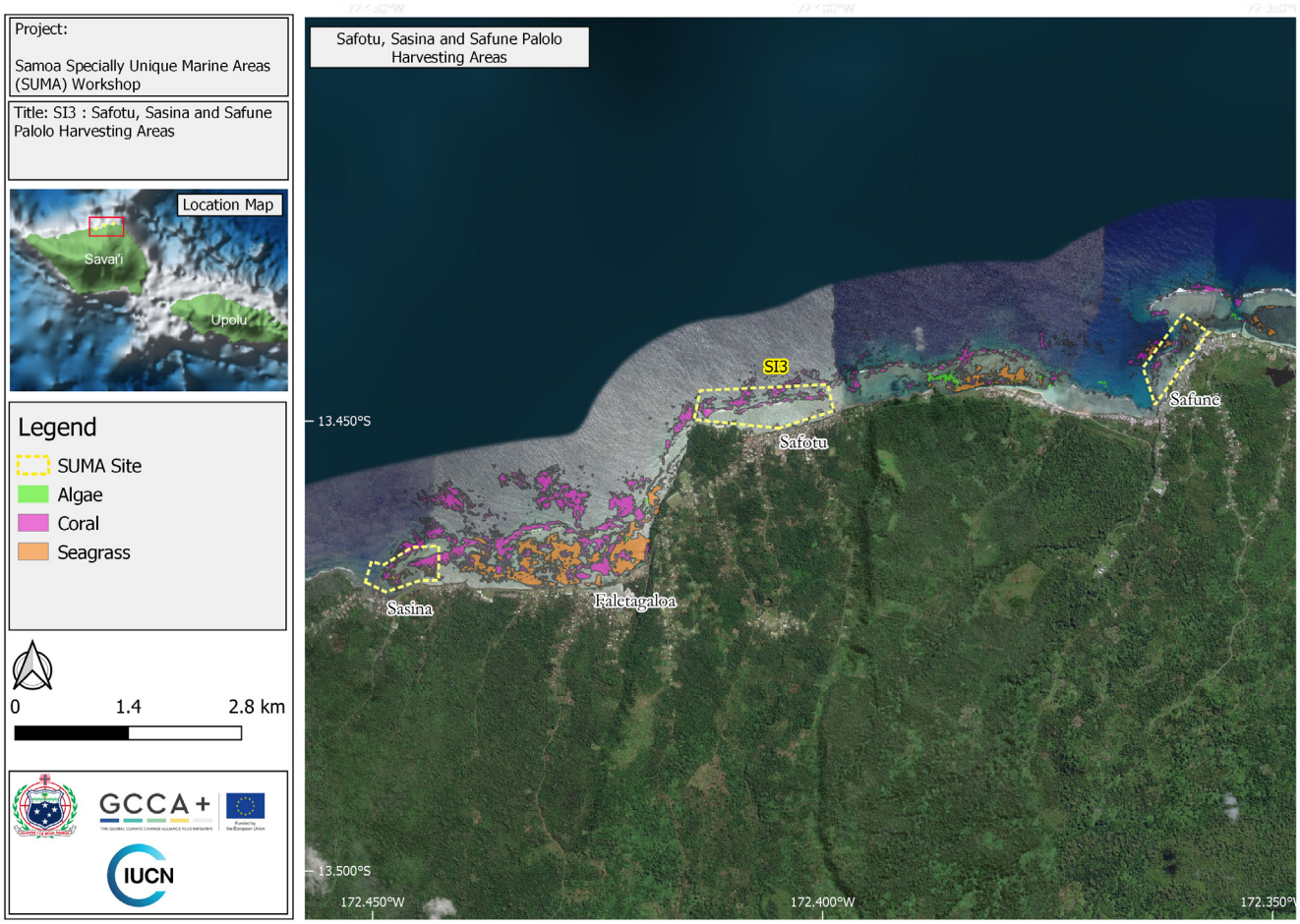


Table 32. Site SI 3: Safotu, Sasina and Safune Palolo harvesting areas

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Savai'i	Safotu, Sasina and Safune Palolo harvesting areas	SI3	5.5

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	SI3 Sasina A	-13.467906	-172.4508161
	SI3 Sasina B	-13.463878	-172.4426506
	SI3 Safotu A	-13.44984593	-172.4142813
	SI3 Safotu B	-13.44593826	-172.3994142
	SI3 Safune A	-13.44818405	-172.3630773
	SI3 Safune b	-13.43817095	-172.3600325

Geographic description (score = 2)

Safotu, Sasina and Safune villages lie near the northern tip of Savai'i Island. The SUMA includes multiple reef flat areas in front of the villages, including the reef flat, crest and upper reef slope.

Justification (score = 1.5)

This area is a known spawning site of the palolo worm (*Palola viridis*), which is a highly sought-after delicacy in Samoa (Tupufia, 2019). The general importance and biology of the palolo worm are reviewed in Site UI 13: Tuialamu Palolo site. A survey of the reef flat in the Sasina and Safotu Community-Based Fish Reserves found high water clarity and coral communities with 40-50% live cover, which appears to have remained stable since 2010 (Tauati, 2014b). A diversity of different coral growth forms were also detected. The fish community was typical of wave-swept, coral-dominated reef flats, and high densities of grazing urchins are likely reducing algal biomass. Surveyors recorded a high proportion of juvenile corals and fishes, and a juvenile giant clam, suggesting this area has good connectivity to upstream larval sources (Tanielu, 2019).

Type and number of sources (score = 1)

Sources containing general information about palolo worms in Samoa used for Site UI 13: Tuialamu Palolo Site were also relevant here. Three additional sources (an online news article and two reports) mentioned this SUMA in particular.

Obligations (score = 1)

The Fisheries Regulation 1996 provides for the sustainable harvest of marine species, including palolo worms, which are listed as Data Deficient on the IUCN's Red List of Threatened Species. The village fisheries' by-laws provide for the conservation and management of the local environment.

Site SI 4: *High shark area*

Figure 34. Site SI 4: high shark area

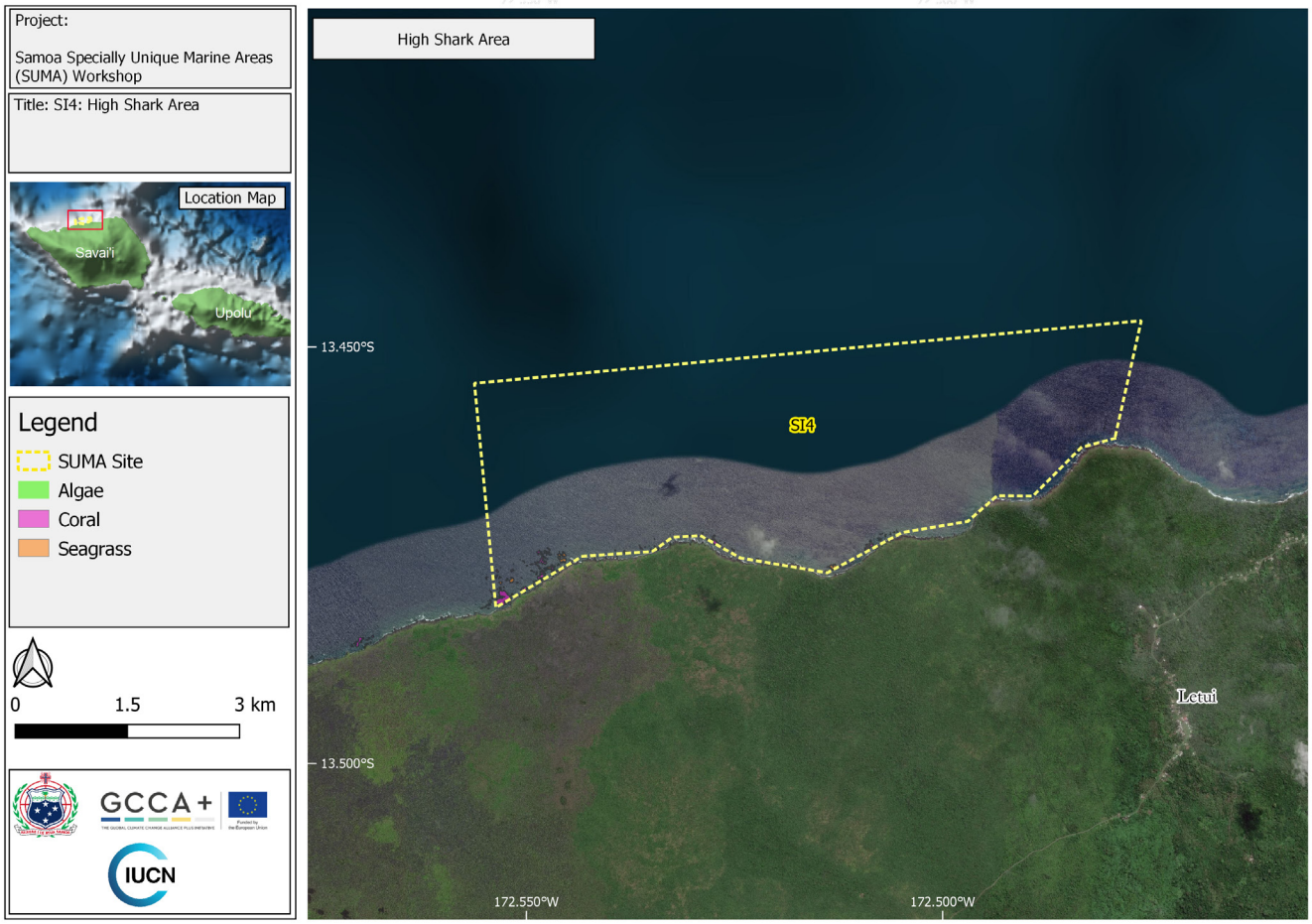


Table 33. Site SI 4: high shark area

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Savai'i	High shark area	SI4	4.5

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	SI4 A	-13.48127747	-172.553672
	SI4 B	-13.44683533	-172.4761434

Geographic description (score = 1)

This SUMA is a marine area on the mid-north coast of Savai'i, approximately 8.5 km long and 1.7 km out to sea. The coastline is uninhabited, with a rocky shore, thick vegetation and a narrow fringing reef.

Justification (score = 1)

This SUMA was selected as an area known for high shark abundance. Samoan waters are home to 30 species of sharks and rays, which are all listed as threatened to some degree (Table 34), and the Samoan Government has declared its EEZ a shark sanctuary (Sawada, 2018). The first research into the population status of sharks off Upolu Island was conducted in 2017, where they are regularly observed by communities (Government of Samoa, 2017b), using Baited Remote Underwater Video System (BRUVS) in collaboration with SPREP, the Australian Institute of Marine Science (AIMS) and the Ministry of Agriculture and Fisheries (Satoa, 2018).

Oceanic sharks are caught as bycatch in Samoa's longline fisheries (Government of Samoa, 2016), and a survey in American Samoa found that reef sharks have declined to 3-10% of their expected baselines densities (Nadon *et al.*, 2012). It is likely that this is also true of Samoan reefs. Information was not available about sharks in this area. However, a community consultation specifically about sharks noted that the villages to the east of this area did not report seeing any sharks in their waters, whilst villages to the west reported small sharks between January and April, and larger sharks during other months (Government of Samoa, 2017b).

Sharks are important predators in marine ecosystems, and high densities are considered a sign of a healthy marine ecosystem (Estes *et al.*, 2011; Roff *et al.*, 2016). 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; Graham *et al.*, 2010; Hisano *et al.*, 2011; Sandin *et al.*, 2008). Their high commercial value combined with slow growth, long life, late maturity and low fecundity reduces productivity of apex predators and inhibits recovery of exploited populations under continued fishing pressure (Collette *et al.*, 2011; Pauly *et al.*, 1998; Stevens *et al.*, 2000).

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). As areas with high local abundance of sharks become more valuable, potentially such as this SUMA, protecting them as sanctuaries would ensure local food webs remain intact.

Type and number of sources (score = 1.5)

General information about the importance and vulnerability of sharks in marine ecosystems was sourced from eleven peer-reviewed papers. Although site-specific information about this SUMA was not available, some information about sharks in Samoa was drawn from a number of websites that reported on the proclamation of the shark sanctuary, and from four reports.

Obligations (score = 1)

The regulations associated with the shark sanctuary ban commercial fishing and the possession, trade, and sale of sharks and shark products throughout Samoa's EEZ, while also prohibiting the use of fishing gear typically used to target sharks, such as wire leaders. The Marine Wildlife Protection Regulation 2009 and the 2018 Amendment provide for the protection of sharks, and most species are on the IUCN Red List of Threatened Species, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Table 34. Sharks and rays known to occur in Samoan waters from MNRE (2013), Government of Samoa (2017b, 2016) and Satoa (2018). All species are listed on the IUCN Red List of Threatened Species and other international agreements. VU: Vulnerable; EN: Endangered; CR: Critically endangered; NT: Near Threatened; DD: Data Deficient. CMS: Convention on Migratory Species, Annex I and II. CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora, Appendix II. WPFC: Western Central Pacific Fisheries Commission; 'yes' indicates that conservation and management measures are in place.

Family	Species name	Common name	Samoan name	IUCN	CMS	CITES	WPFC
Alopiidae	*Alopias pelagicus*	Pelagic thresher		EN	II	II	yes
Alopiidae	*Alopias superciliosus*	Bigeye thresher		VU	II	II	yes
Alopiidae	*Alopias vulpinus*	Common thresher		VU	II	II	yes
Carcharhinidae	*Carcharhinus albimarginatus*	Silvertip shark	Aso	VU			
Carcharhinidae	*Carcharhinus amblyrhynchos*	Grey reef shark	Malie-aloalo	NT			
Carcharhinidae	*Carcharhinus falciformis*	Silky shark	Malie	VU	II	II	yes
Carcharhinidae	*Carcharhinus galapagensis*	Galapagos shark	Malie	NT			
Carcharhinidae	*Carcharhinus leucas*	Bull shark	Malie	NT			
Carcharhinidae	*Carcharhinus limbatus*	Blacktip shark	Malie	NT			
Carcharhinidae	*Carcharhinus longimanus*	Oceanic whitetip shark	Apoapo	CR		II	yes
Carcharhinidae	*Carcharhinus melanopterus*	Blacktip reef shark	Malie-alamata	NT			
Carcharhinidae	*Galeocerdo cuvier*	Tiger shark	Naiufi	NT			
Carcharhinidae	*Negaprion acutidens*	Lemon shark	Malie	VU			
Carcharhinidae	*Prionace glauca*	Blue shark	Malie	NT			yes
Carcharhinidae	*Triaenodon obesus*	Whitetip reef shark	Malu	NT			
Cetorhinidae	*Cetorhinus maximus*	Basking shark		EN	I&II	II	
Dasyatidae	*Neotrygon kuhlii*	Bluespotted stingray	Fai-malie	DD			
Dasyatidae	*Himantura fai*	Pink whipray	Fai aloalo	LC			
Ginglymostomatidae	*Nebrius ferrugineus*	Tawny nurse shark	Moemoeao	VU			
Hexanchidae	*Hexanchus griseus*	Bluntnose sixgill shark	Malie	NT			
Lamnidae	*Carcharodon carcharias*	Great white shark	Malie	VU	I&II	II	
Lamnidae	*Isurus oxyrinchus*	Shortfin mako	Malie	EN	II		yes
Myliobatidae	*Aetobatus ocellatus*	Indo-Pacific spotted eagle ray	Fai manu		I&II	II	yes
Myliobatidae	*Mobula alfredi*	Reef manta ray	Fai pe'a	VU	I&II	II	yes
Myliobatidae	*Mobula japanica*	Spinetail manta	Fai-tala	NT	I&II	II	yes
Myliobatidae	*Mobula kuhlii*	Shortfin devil ray	Fai	DD	I&II	II	yes
Myliobatidae	*Mobula mobular*	Devil ray	Fai	EN	I&II	II	yes
Myliobatidae	*Mobula tarapacana*	Chilean devil ray		VU	I&II	II	yes
Myliobatidae	*Mobula thrustoni*	Smoothtail mobula		NT	I&II	II	yes
Pseudocharchariidae	*Pseudocarcharias kamoharai*	Crocodile shark		NT			
Rhincodontidae	*Rhincodon typus*	Whale shark		EN	II	II	yes
Rhinobatidae	*Rhyncobatus djiddensis*	Guitarfish		VU			
Sphyrnidae	*Sphyrna lewini*	Scalloped hammerhead	Mata'italiga	CR	II	II	yes
Sphyrnidae	*Sphyrna mokarran*	Great hammerhead	Mata'italiga	CR	II	II	yes
Sphyrnidae	*Sphyrna zygaena*	Smooth hammerhead	Mata'italiga	VU		II	yes
Squalidae	*Squalus* cf. *megalops*	Shortnose spurdog		DD			
Stegostomatidae	*Stegostoma tigrinum*	Zebra shark	Moemoeao	EN			

Site SI 5: *Satupa'itea to Fa'a'ala*

Figure 35. Site SI 5: Satupa'itea to Fa'a'ala

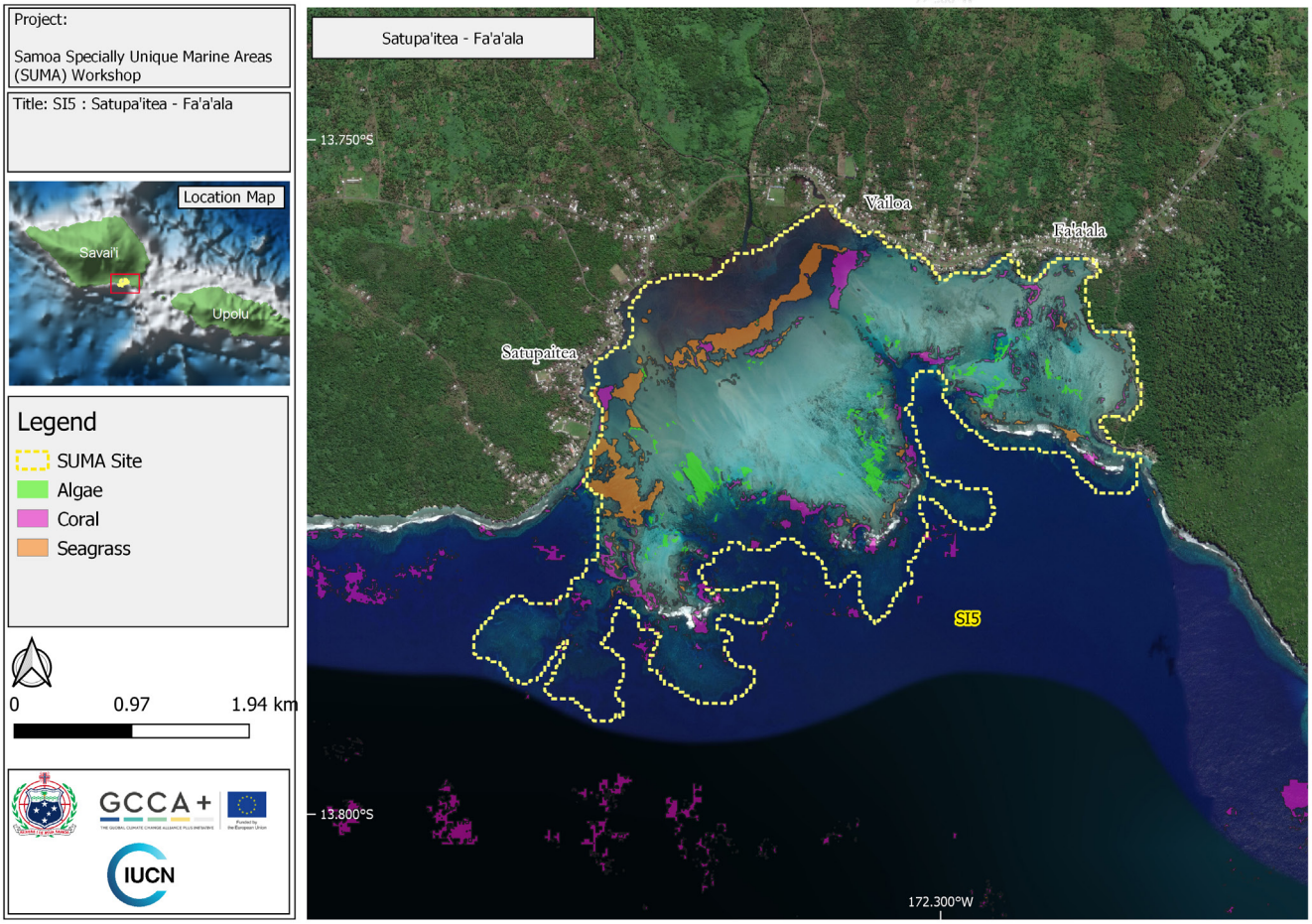


Table 35. Site SI 5: Satupa'itea to Fa'a'ala

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Savai'i	Satupa'itea to Fa'a'ala	SI5	7.5

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	SI5 A	-13.78815023	-172.3346307
	SI5 B	-13.75883408	-172.2886851

Geographic description (score = 2.5)

This SUMA is the extensive reef flat and slope on the southeastern corner of Savai'i Island, between the villages of Satupa'itea and Fa'a'ala, extending approximately 3 km out to sea and along 8 km of complex shoreline.

Justification (score = 1)

This SUMA includes an extensive coral reef system and a turtle nesting site. Information on the values of coral reefs in Samoa is presented in Site UI 4: Fagaloa Bay. The reef system in this SUMA is unusual in its orientation towards the prevailing southeasterly trade winds, its large area and its complex structure. It is considered among the areas of highest reef development on Savai'i Island (MNRE, 2013), and is among the few bays in Samoa with some seagrass development, primarily *Syringodium isoetifolium* and *Halophila ovalis* (Zann, 1999). This suggests a number of interconnected habitats, which is known to promote overall biodiversity. Studies conducted here found high coral cover of over 50% (Tanielu, 2015b) and medium coral richness and fish biomass (Kendall and Poti, 2011). This was also one of the sites with the highest species richness of reef fishes (Kendall and Poti, 2011). However, more recent surveys on the reef crest found low coral cover (<10%) and a benthic community dominated by turf and crustose coralline algae (Seinor *et al.*, 2020).

A number of studies exist on turtles nesting and foraging in Samoan waters (see Site SI 1: Northwest Savai'i), but none that particularly refer to this area. The presence of seagrass suggests favourable foraging habitat, at least for green turtles.

Type and number of sources (score = 2)

The information sources used to describe coral reefs, turtles and seagrasses for Site UI 4: Fagaloa Bay, Site SI 1: Northwest Savai'i and Site UI 6: Manono Reef Flats were also relevant here. Additionally, this SUMA is mentioned in three reports and two peer-reviewed papers.

Obligations (score = 2)

The Fisheries Management Act 2016 and the Marine Wildlife Protection Regulation 2009 provide for the protection of turtles, as well as coral reefs and species that depend on them. The NBSAP expressed the intention to improve coral reef health by 2020. Turtles and many species that spend all or part of their life cycle in coral reef ecosystems are on the IUCN Red List of Threatened Species, the Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Site SI 6: *Foailalo Community-Based Fish Reserve*

Figure 36. Site SI 6: Foailalo Community-Based Fish Reserve

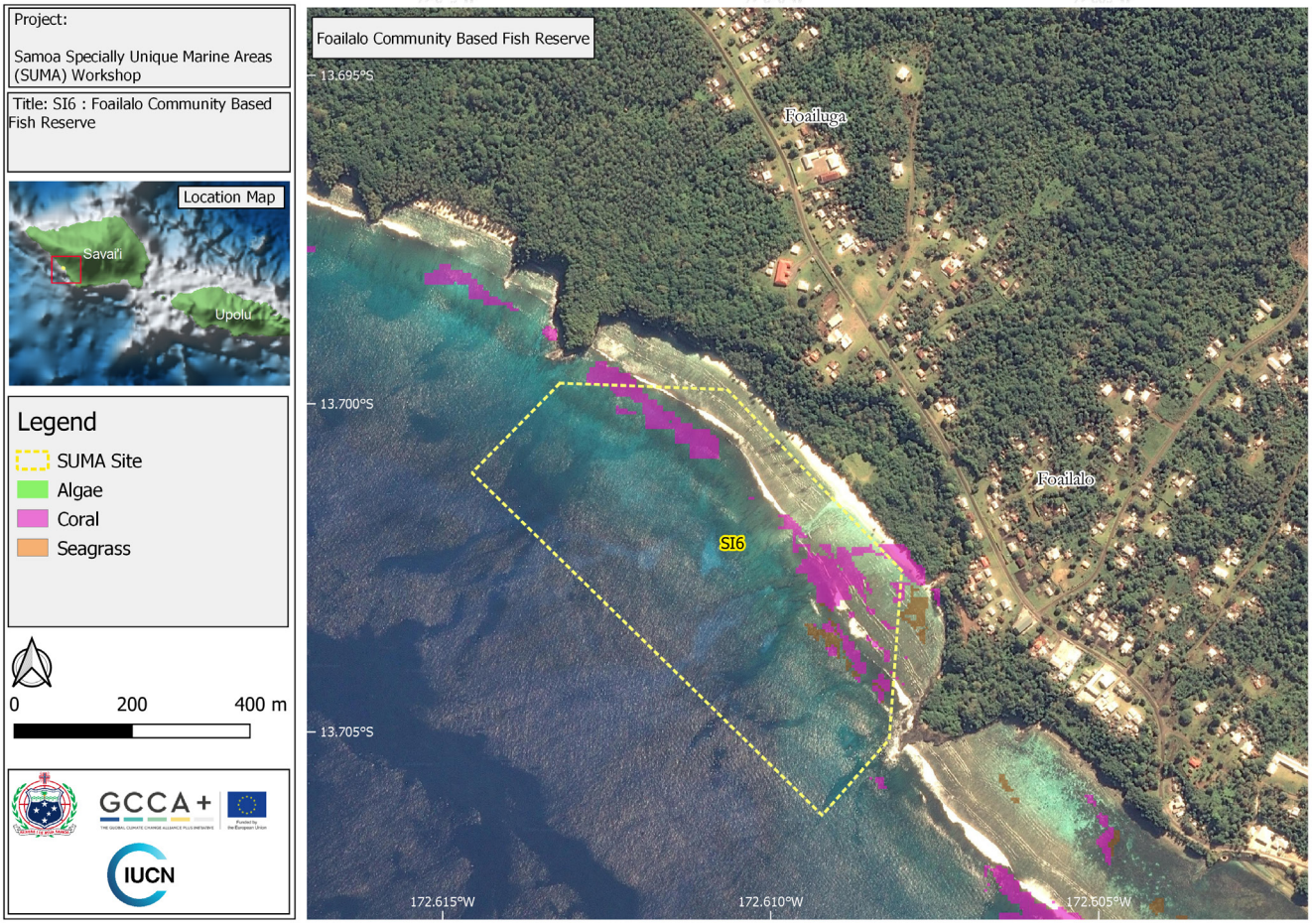
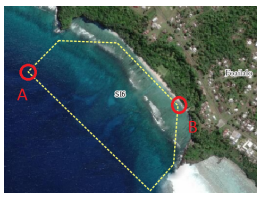


Table 36. Site SI 6: Foailalo Community-Based Fish Reserve

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Savai'i	Foailalo Community-Based Fish Reserve	SI6	7

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	SI6 A	-13.70105346	-172.6145528
	SI6 B	-13.70254202	-172.608003

Geographic description (score = 3)

This SUMA is a community-based fish reserve on the reef flat and reef slope in front of Foailalo Village, on the southwestern side of Savai'i Island. It encompasses a stretch of reef approximately 700 m long and measures 0.59 km^2 in total (WCMC, 2020).

Justification (score = 1.5)

This SUMA was designated as a community-based fish reserve in 2000 (WCMC, 2020). The coastline in this area is predominantly lava rock, with a reef system protected by a narrow lagoon extending seaward to around 300 m (MNRE, 2018c). Coral reef surveys found a very high coral richness and medium coral cover in this general area (Kendall and Poti, 2011), with coral communities reportedly recovering well after damage from a 2009 tsunami (MNRE, 2018c). Coral cover on the reef crest is currently around 21%, with turf and coralline algae both at around 30% cover (Seinor *et al.*, 2020). This suggests coral reef habitats may be healthy, and that protection of these areas will encourage the persistence of populations of target fish and invertebrate faunas. However, as a newly established reserve, it may take some time for management-related changes to become apparent (Russ and Alcala, 2004).

Information used to describe the values of community-based fish reserves in Site UI 3: Lufilufi/Faleapuna Community-Based Fish Reserve also applies to this SUMA. The proximity of this reserve to three other village-based fish reserves (Site SI 7: Foailuga Community-Based Fish Reserve, Site SI 8: Sala'ilua Community-Based Fish Reserve and Site SI 9: Satuiatua Community-Based Fish Reserve), effectively makes it part of a network. It is well-known that marine protected area networks enhance the effectiveness of protection by spreading risk and including a wider range of habitats, thus ensuring the inclusion of a greater variety of species (Almany *et al.*, 2009).

Type and number of sources (score = 1.5)

The sources used to discuss the values of local management of marine resources in general, and particularly in Samoa in Site UI 3: Lufilufi/Faleapuna Community-Based Fish Reserve are also relevant here. One peer-reviewed paper and two reports contained information about this SUMA, including the reserve shown on protected area maps of Samoa.

Obligations (score = 1)

The Fisheries Management Act 2016 prescribes a precautionary approach for the management of fish stocks and the sustainable use of all aquatic resources. Establishing well-protected fish reserves is also a priority within the NAPA and NBSAP. The village fisheries' by-laws provide for the conservation and management of the local environment, and for the management of community-based fish reserves.

Site SI 7: *Foailuga Community-Based Fish Reserve*

Figure 37. Site SI 7: Foailuga Community-Based Fish Reserve

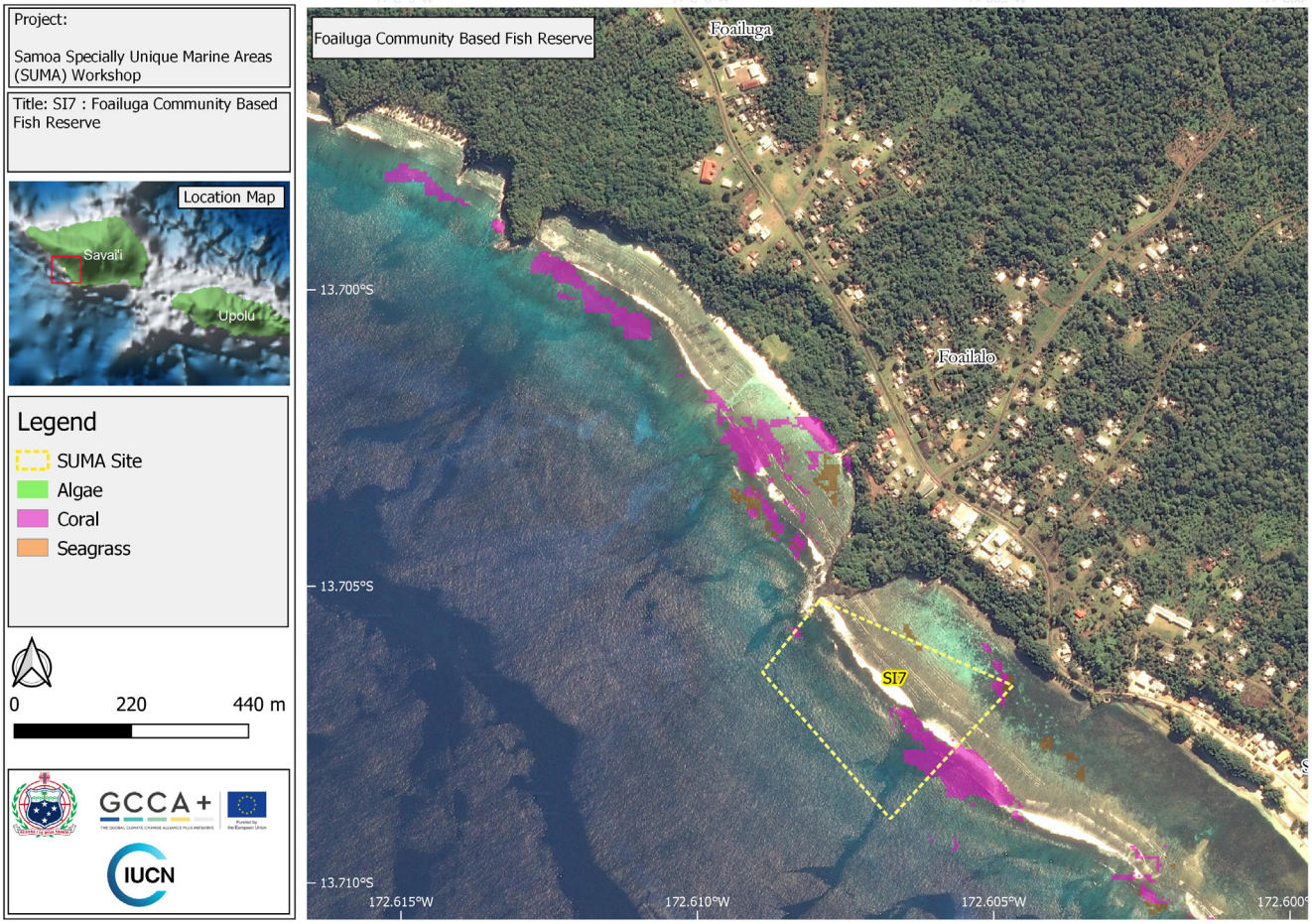


Table 37. Site SI 7: Foailuga Community- Based Fish Reserve

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Savai'i	Foailuga Community-Based Fish Reserve	SI7	6

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	SI7 A	-13.70644969	-172.6089013
	SI7 B	-13.70667427	-172.6046792

Geographic description (score = 2)

This SUMA is a community-based fish reserve on the reef flat and reef slope in front of Foailuga Village, on the southwestern side of Savai'i Island. It encompasses a stretch of reef approximately 280 m long and measures 0.09 km^2 in total.

Justification (score = 1.5)

This SUMA is a recently established community-based fish reserve; an older fish reserve was discontinued after the tsunami in 2009 (MNRE, 2018c). The coastline in this area is predominantly lava rock, with a reef system protected by a narrow lagoon extending seaward to around 300 m (MNRE, 2018c). Coral reef surveys found that this general area had very high coral richness and medium coral cover (Kendall and Poti, 2011), with coral communities reportedly recovering well after damage from a 2009 tsunami (MNRE, 2018c). This suggests coral reef habitats may be healthy, and protection of these areas will support fish and invertebrate faunas that may have been overexploited in the past. However, as a newly established reserve, it may take some time for management-related changes to become apparent (Russ and Alcala, 2004).

Information used to describe the values of community-based marine reserves in Site UI 3: Lufilufi/Faleapuna Community-Based Fish Reserve also applied to this SUMA. The proximity of this reserve to three other village-based fish reserves (Site SI 6: Foailalo Community-Based Fish Reserve, Site SI 8: Sala'ilua Community-Based Fish Reserve and Site SI 9: Satuiatua Community-Based Fish Reserve) effectively makes it part of a network. It is well-known that marine protected area networks enhance the effectiveness of protection by spreading risk and including a wider range of habitats, thus ensuring the inclusion of a greater variety of species (Almany *et al.*, 2009).

Type and number of sources (score = 1.5)

The sources used to discuss the values of local management of marine resources in general, and particularly in Samoa, in Site UI 3: Lufilufi/Faleapuna Community-Based Fish Reserve were also relevant here. Two reports mentioning this SUMA included some information on the reserve.

Obligations (score = 1)

The Fisheries Management Act 2016 prescribes a precautionary approach for the management of fish stocks and the sustainable use of all aquatic resources. Establishing well-protected fish reserves is also a priority within the NAPA and NBSAP. The village fisheries by-laws provide for the conservation and management of the local environment, and for the management of community-based fish reserves.

Site SI 8: *Sala'ilua Community-Based Fish Reserve*

Figure 38. Site SI 8: Sala'ilua Community-Based Fish Reserve

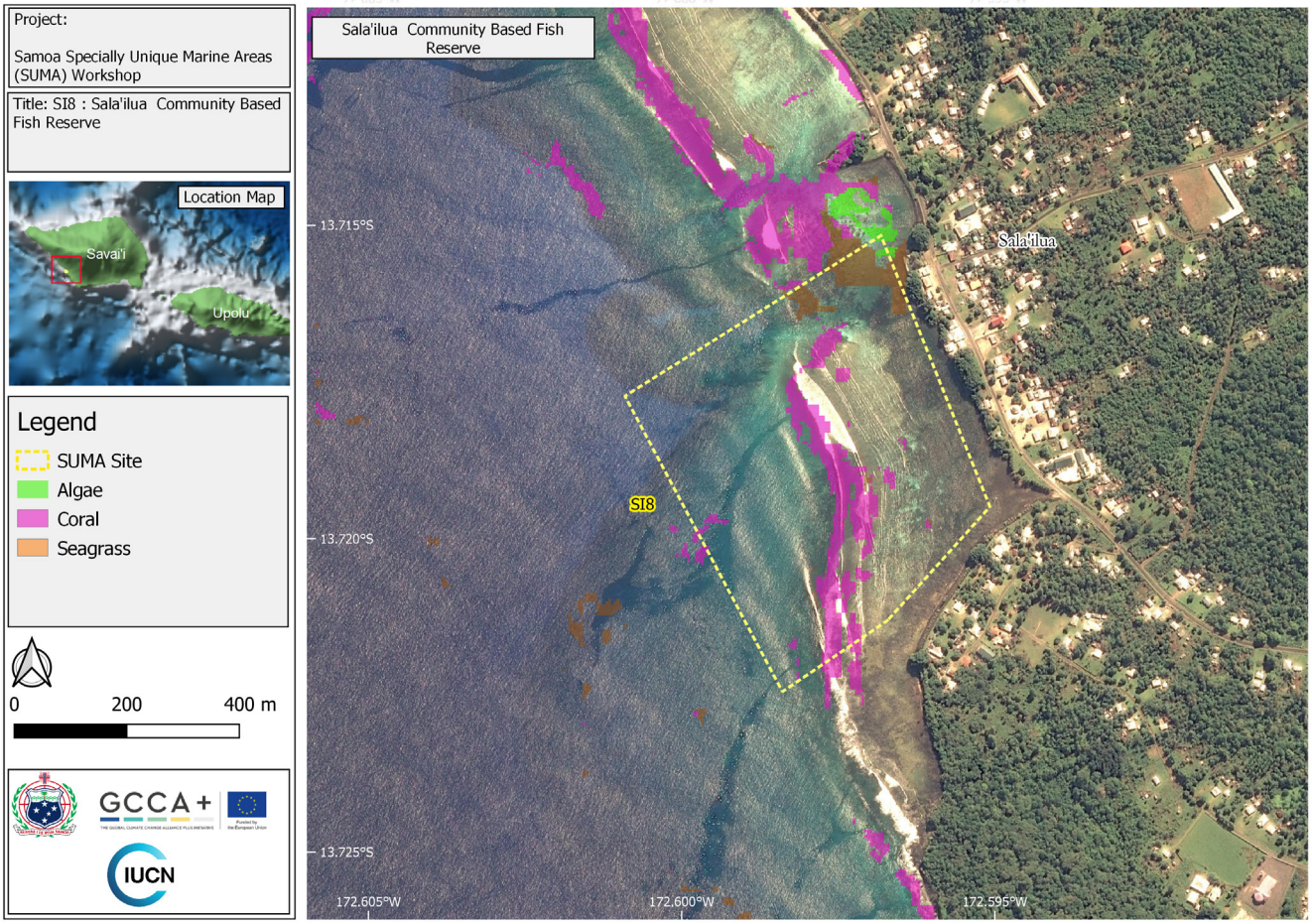
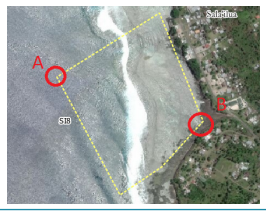


Table 38. Site SI 8: Sala'ilua Community-Based Fish Reserve

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Savai'i	Sala'ilua Community-Based Fish Reserve	SI8	6

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	SI8 A	-13.71772355	-172.6009063
	SI8 B	-13.71949005	-172.5950785

Geographic description (score = 2)

This SUMA is a community-based fish reserve on the reef flat and reef slope in front of Sala'ilua Village, on the southwestern side of Savai'i Island. It encompasses a stretch of reef approximately 500 m long and measures 0.3 km^2 in total.

Justification (score = 1.5)

This SUMA is a recently established community-based fish reserve; an older fish reserve was discontinued after the tsunami in 2009 (MNRE, 2018c). The coastline in this area is predominantly lava rock, with a reef system protected by a narrow lagoon extending seaward to around 300 m (MNRE, 2018c). Coral reef surveys found that this general area had very high coral richness and medium coral cover (Kendall and Poti, 2011), with coral communities reportedly recovering well after damage from a 2009 tsunami (MNRE, 2018c). This suggests the coral reef habitats may be healthy and resilient, and that protection of these areas will increase the prevalence of fish and invertebrate faunas. However, as a newly established reserve, it may take some time for management-related changes to become apparent (Russ and Alcala, 2004). The replanting of trees in the watershed above the village will also reduce sedimentation and improve water quality in the coral reef habitats (Government of Samoa, 2017a).

Information used to describe the values of community-based marine reserves in Site UI 3: Lufilufi/Faleapuna Community-Based Fish Reserve also applies to this SUMA. The proximity of this reserve to three other village-based fish reserves (Site SI 6: Foailalo Community-Based Fish Reserve, Site SI 7: Foailuga Community-Based Fish Reserve, and Site SI 9: Satuiatua Community-Based Fish Reserve) effectively makes it part of a network. It is well-known that marine protected area networks enhance the effectiveness of protection by spreading risk and including a wider range of habitats, thus ensuring the inclusion of a greater variety of species (Almany *et al.*, 2009).

Type and number of sources (score = 1.5)

The sources used to discuss the values of local management of marine resources in general, and particularly in Samoa, in Site UI 3: Lufilufi/Faleapuna Community-Based Fish Reserve, are also relevant here. Three reports mentioned this SUMA, including some information on the reserve.

Obligations (score = 1)

The Fisheries Management Act 2016 prescribes a precautionary approach for the management of fish stocks and the sustainable use of all aquatic resources. Establishing well-protected fish reserves is also a priority within the NAPA and NBSAP. The village fisheries by-laws provide for the conservation and management of the local environment, and for the management of community-based fish reserves.

Site SI 9: *Satuiatua Community-Based Fish Reserve*

Figure 39. Site SI 9: Satuiatua Community-Based Fish Reserve

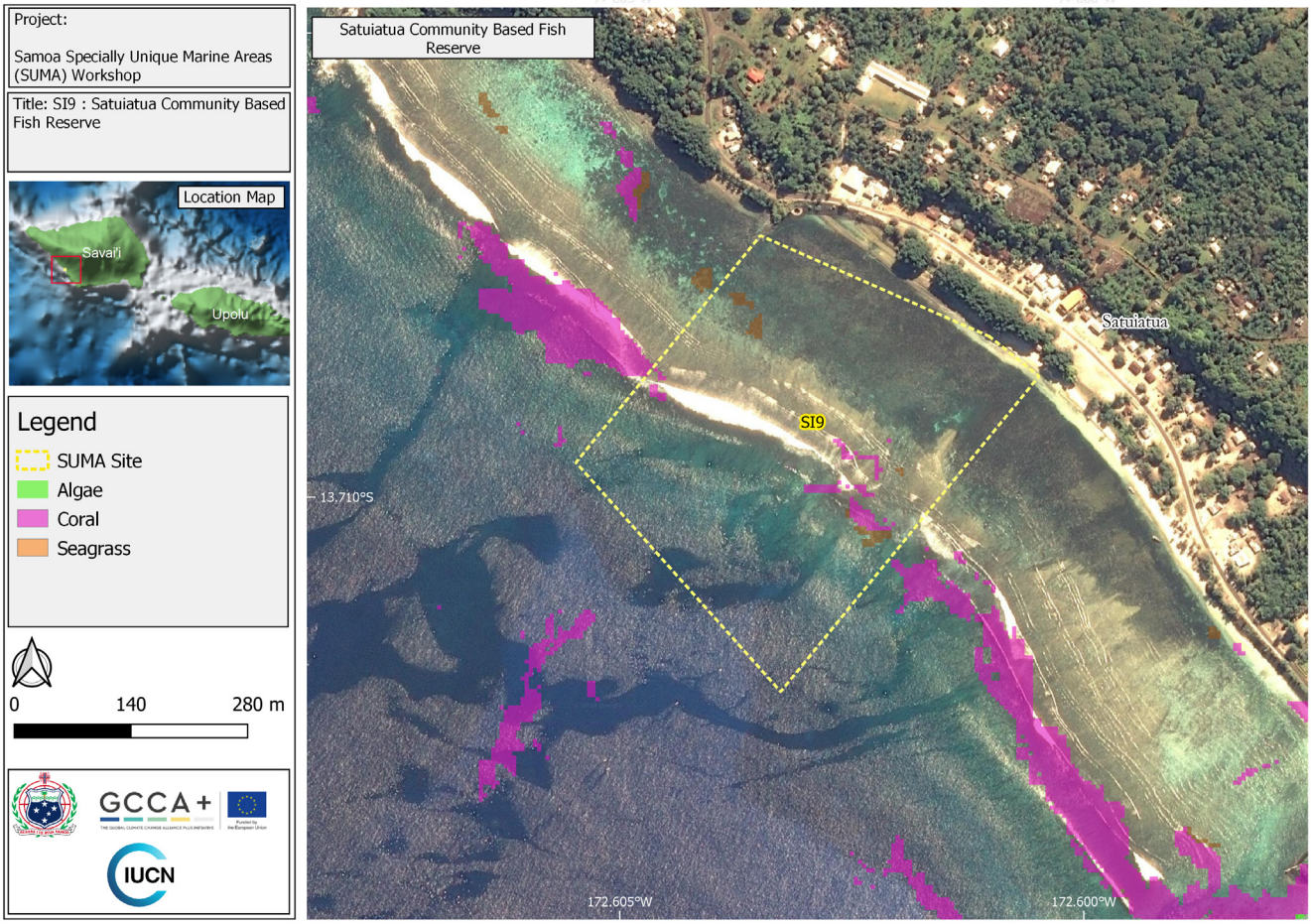
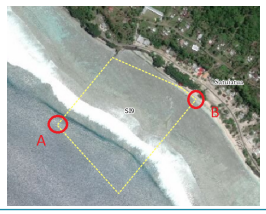


Table 39. Site SI 9: Satuiatua Community- Based Fish Reserve

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Savai'i	Satuiatua Community-Based Fish Reserve	SI9	6

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	SI9 A	-13.70962679	-172.6054736
	SI9 B	-13.70869708	-172.6004827

Geographic description (score = 2)

This SUMA is a community-based fish reserve on the reef flat and reef slope in front of Satuiatua Village, on the southwestern side of Savai'i Island. It encompasses a stretch of reef approximately 380 m long and measures 0.15 km^2 in total.

Justification (score = 1.5)

This SUMA was established as a marine protected area in 2015 with a focus on biodiversity conservation and ecotourism development (Government of Samoa, 2017a). The predominantly lava rock coastline has a reef system protected by a narrow lagoon extending seaward to around 300 m (MNRE, 2018c). Coral reef surveys found this general area had very high coral richness and medium coral cover (Kendall and Poti, 2011), with coral communities reportedly recovering well post damage from a 2009 tsunami (MNRE, 2018c). Repeated surveys of the fish reserve in 2011, 2014 and 2015 found consistently high (>60%) coral cover, with a slight decline in 2015 coinciding with an increase in turf-covered dead coral skeletons. More recent surveys revealed coral cover on the reef crest was 15%, with high cover (47%) of crustose coralline algae (Seinor *et al.*, 2020). As a newly established reserve, it may take some time for management-related changes to become apparent (Russ and Alcala, 2004).

Information used to describe the values of community-based marine reserves in Site UI 3: Lufilufi/Faleapuna Community-Based Fish Reserve also applies to this SUMA. The proximity of this reserve to three other village-based fish reserves (Site SI 6: Foailalo Community-Based Fish Reserve, Site SI 7: Foailuga Community-Based Fish Reserve and Site SI 8: Sala'ilua Community-Based Fish Reserve) effectively renders it part of a network. It is well-known that marine protected area networks enhance the effectiveness of protection by spreading risk and including a wider range of habitats, thus ensuring the inclusion of a greater variety of species (Almany *et al.*, 2009).

Type and number of sources (score = 1.5)

The sources used to discuss the values of local management of marine resources in general, and particularly in Samoa, in Site UI 3: Lufilufi/Faleapuna Community-Based Fish Reserve are also relevant here. Three reports mentioned this SUMA, including some information on the reserve; one peer-reviewed paper contained information about the reef's benthic cover.

Obligations (score = 1)

The Fisheries Management Act 2016 prescribes a precautionary approach for the management of fish stocks and the sustainable use of all aquatic resources. Establishing well-protected fish reserves is also a priority within the NAPA and NBSAP. The village fisheries by-laws provide for the conservation and management of the local environment, and for the management of community-based fish reserves.

Site SI 10: *Palauli Community-Based Fish Reserve*

Figure 40. Site SI 10: Palauli Community-Based Fish Reserves

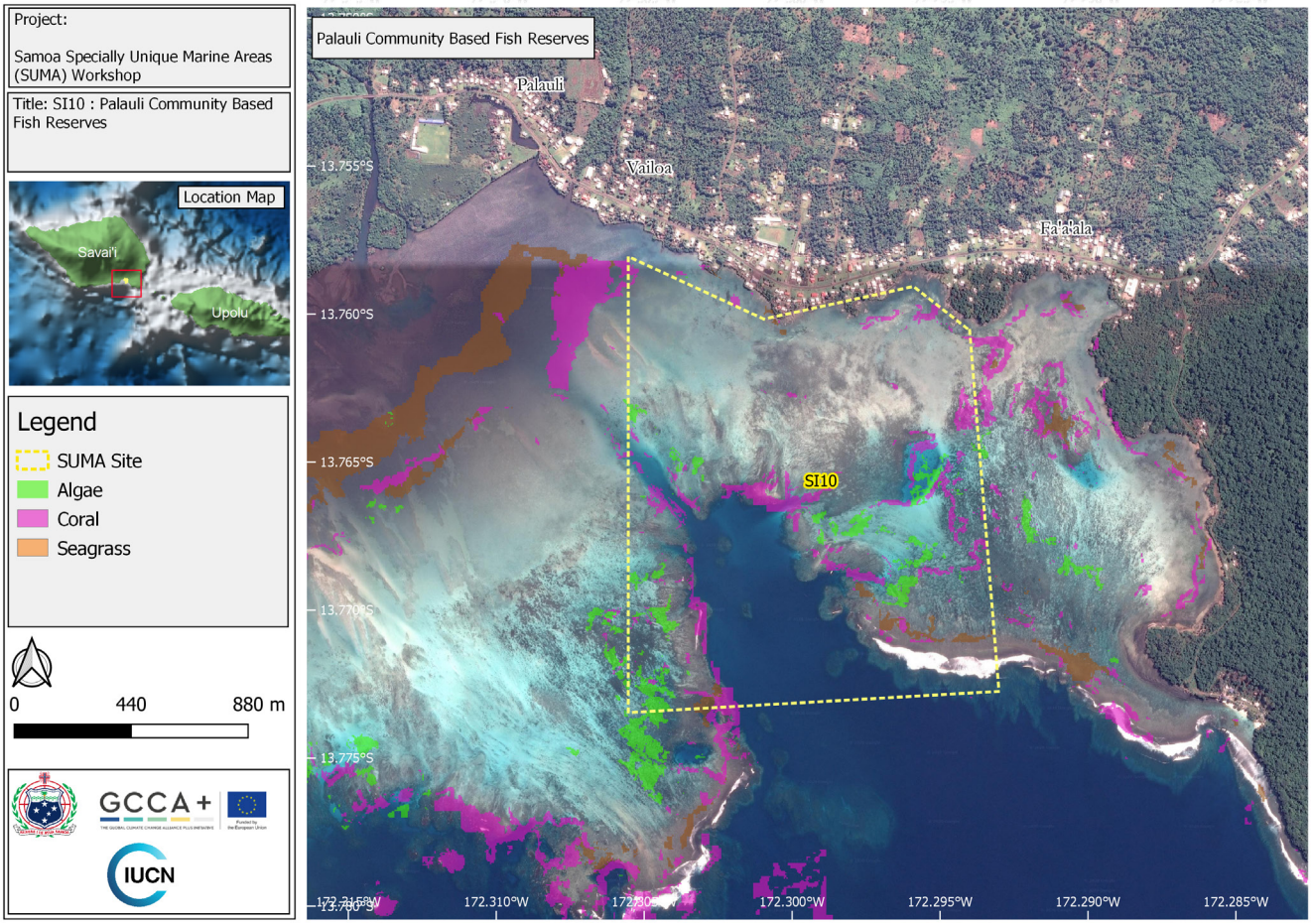
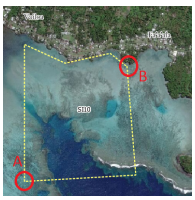


Table 40. Site SI 10: Palauli Community- Based Fish Reserves

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Savai'i	Palauli Community-Based Fish Reserves	SI10	7

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	SI10 A	-13.77346401	-172.3055402
	SI10 B	-13.76055455	-172.2940003

Geographic description (score = 3)

The Vaito'amuli and Faala Palauli Community-Based Fish Reserves are included within the general reef ecosystem of the southeastern side of Savai'i Island, to the west of Site SI 5: Satupa'itea to Fa'a'ala. The Reserves measure 0.34 km^2 (Vaito'amuli) and 1.33 km^2 (Faala).

Justification (score = 1.5)

This SUMA has been a Community-Based Fish Reserve since 1998, and like most other reserves has been subject to some monitoring. The reserve was established as a sanctuary for fish and other marine life, with the intention of fostering population replenishment (Aukusitino and Ah Leong, 2008). In 2007, a monitoring survey found the reef to be in very good condition inclusive of very high coral cover dominated by *Acropora* spp. Coral cover had increased from 56% in 2006 to 71% in 2008. The biomass of food fish (mainly surgeonfish and parrotfish) was considered very high, complemented by seemingly healthy populations of macroinvertebrates (Aukusitino and Ah Leong, 2008). Kendall and Poti (2011) reported medium coral cover (~50%), high coral richness and high fish richness but low fish biomass.

Surveys on the reef crest conducted in 2018 recorded just over 7% live coral cover; this difference may be due to reef degradation during the preceding decade, or simply the product of sampling in a different habitat (Seinor *et al.*, 2020). Information used to describe the values of community-based marine reserves in Site UI 3: Lufilufi/Faleapuna Community-Based Fish Reserve also applies to this SUMA.

Type and number of sources (score = 1.5)

The material used to discuss the values of local management of marine resources in general, and particularly in Samoa, in Site UI 3: Lufilufi/Faleapuna Community-Based Fish Reserve are also relevant here. Two reports mentioned this SUMA, including some information on the reserve; one peer-reviewed paper contained information about benthic cover.

Obligations (score = 1)

The Fisheries Management Act 2016 prescribes a precautionary approach for the management of fish stocks and the sustainable use of all aquatic resources. Establishing well-protected fish reserves is also a priority within the NAPA and NBSAP. The village fisheries by-laws provide for the conservation and management of the local environment, and for the management of community-based fish reserves.

Site SI 11: *Multiple Community-Based Fish Reserve*

Figure 41. Site SI 11: Multiple Community-Based Fish Reserves

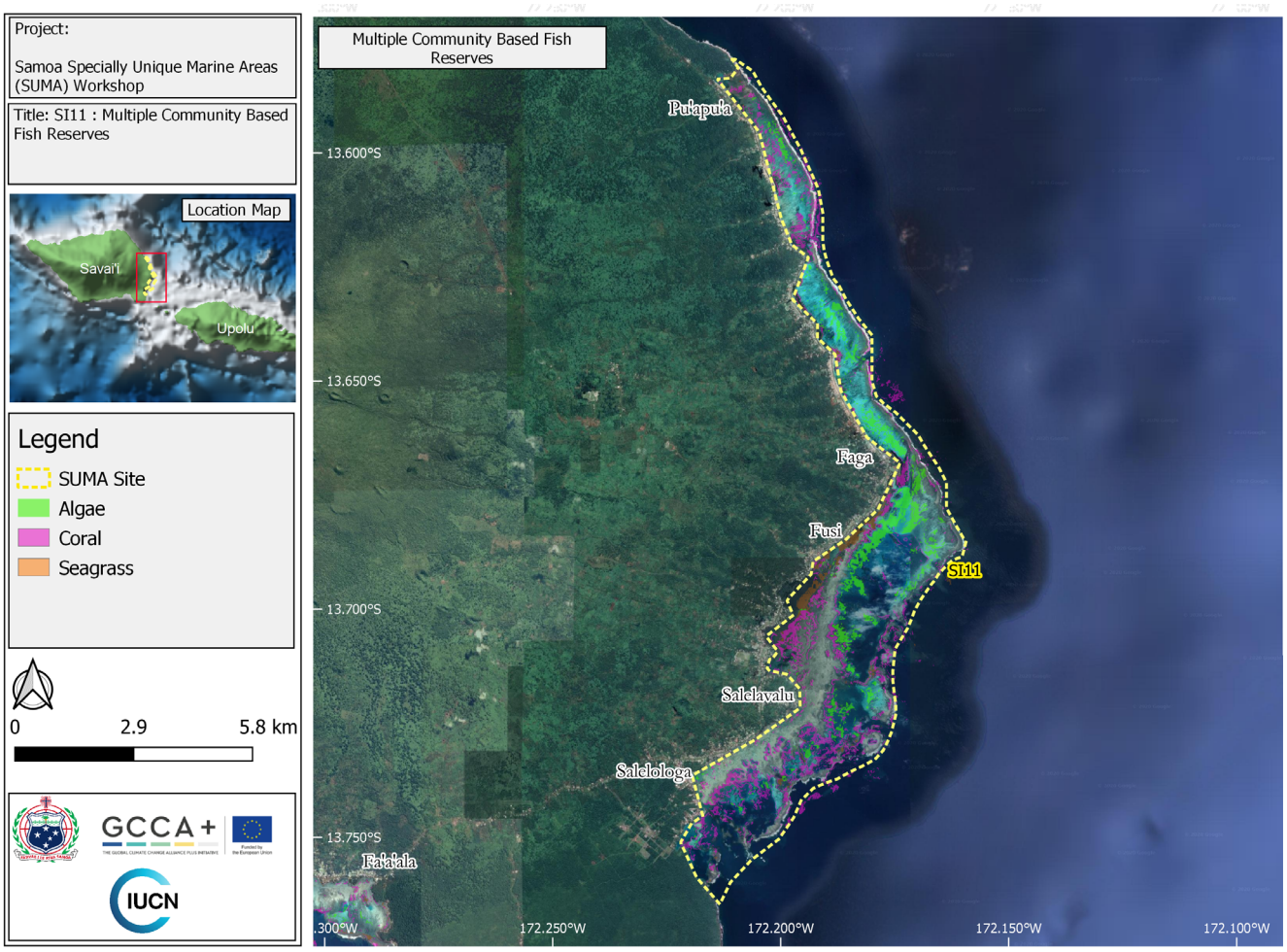


Table 41. Site SI 11: Multiple Community-Based Fish Reserves

Geographic Cluster	Site Name	Site Code	Overall Rating
Inshore sites – Savai'i	Multiple Community-Based Fish Reserves	SI11	5.5

Geographic boundaries

Reference points	Point labels	Latitude	Longitude
	SI11 B	-13.68534508	-172.159391
	SI11 C	-13.58380568	-172.2139192

Geographic description (score = 1)

This SUMA is a section of the northeastern Savai'i coastline that extends from Salelologa Village to Pu'apu'a Village. It includes the contiguous reef system that extends between 500 m and 1 km offshore in front of all the villages, and the various community-based fish reserves administered by the villages.

Justification (score = 1.5)

The northeastern coast of Savai'i hosts the largest area of coral reef development on Savai'i Island (Zann, 1999), and the entire reef system is included in this SUMA (35 km²). Unlike many of the fringing reefs in Samoa, this area has developed barrier reefs with lagoons up to 10 m deep (Zann, 1999). The ten community-based fish reserves in the SUMA essentially create a reserve network (Table 42).

A resource assessment in the area around Salelavalu concluded that finfish and invertebrate stocks were in poor condition (Vunisea *et al.*, 2005). Coral reef surveys reported that this area, especially the northern half, had a large proportion of sites with high coral cover and richness (Tauati, 2015), while coral community structure showed connectivity to the western end of Upolu Island (Kendall and Poti, 2011). This area also comprised several sites with medium to high fish abundance, whereas the southern half facing Apolima Strait had lower values for fish and coral richness (Kendall and Poti, 2011). It is likely this area experienced degradation since those assessments occurred as recent surveys of reef crest sites scattered throughout the area reported average coral cover of only 10% (Seinor *et al.*, 2020).

Shallow reef flats surveyed to assess the conditions of fish reserves found low coral cover of 4% at the southern end of the SUMA (Sapatu, 2013a). Macroalgal cover on the reef crest was low, and the benthic community was dominated by crustose coralline algae and low-lying turf (Seinor *et al.*, 2020). However, some reef flat surveys revealed high macroalgal cover, especially in turbid areas (Sapatu, 2013a). Repeated surveys for this area indicate a decline in reef flat coral cover (Aiafi, 2017e).

Table 42. Community-based fish reserves in the SUMA with descriptions where available (King and Faasili, 1999; MNRE, 2018d, 2018e, 2018f, 2018g; WCMC, 2020).

Name	Designated	Area (km²)	Goals and actions
Pu'apu'a	1997	1.23	No-take fish reserve, restocking (clams), collect cots, mesh size limits, ban destructive fishing and rubbish dumping, protect sustainable fisheries, biodiversity, local species diversity, ecosystem services and functions, mangrove conservation, climate change adaptation actions, and ban sand mining
Salelavalu			No-take fish reserve, collect crown-of-thorns, protect biodiversity, coral reefs and inshore fisheries
Fogapoa / Tuavisi	2014		No-take fish reserve, food security, fish stock sustainability, coral restoration, giant clam restocking, ban destructive fishing methods, ban dumping rubbish, ban fishing of sea cucumber for export purposes
Sapini/Lu'ua	2006	0.36	No-take fish reserve, restocking (clams and trochus), collect cots, ban destructive fishing and rubbish dumping, protect sustainable fisheries, biodiversity, local species diversity, ecosystem services and functions, mesh and fish size limits
Saipipi	2011		No-take fish reserve, collect COTS, ban destructive fishing and rubbish dumping, protect sustainable fisheries, biodiversity, local species diversity, ecosystem services and functions, fish and mesh size limit regulation

Table 42. Community-based fish reserves in the SUMA with descriptions where available (King and Faasili, 1999; MNRE, 2018d, 2018e, 2018f, 2018g; WCMC, 2020). (Cont.)

Siufaga, Faga	2002	0.26	No-take fish reserve, restocking, collect COTS, ban destructive fishing and rubbish dumping, protect sustainable fisheries, biodiversity, local species diversity, ecosystem services and functions
Salimu, Faga	2007	0.51	No-take fish reserve, restocking, collect COTS, ban destructive fishing and rubbish dumping, protect sustainable fisheries, biodiversity, local species diversity, ecosystem services and functions, deploying nearshore FADs to promote offshore fishing
Sapapali'i	1988	1.77	No-take fish reserve, restocking (clams), collect COTS, ban destructive fishing and rubbish dumping, protect sustainable fisheries, biodiversity, local species diversity, ecosystem services and functions, mangrove protected area, set up tilapia farming
Satalafai/Sapulu	1997	0.12	No-take fish reserve, restocking (clams and trochus), collect COTS, ban destructive fishing and rubbish dumping, protect sustainable fisheries, biodiversity, local species diversity, ecosystem services and functions, farming tilapia and mangrove reserve conservation
Asaga	1997	0.20	No take zone, restocking (clams), collect COTS, mesh size limits, ban destructive fishing and rubbish dumping, protect sustainable fisheries, biodiversity, local species diversity, ecosystem services and functions, ban sand mining

The northern end of the SUMA encompasses sites with high coral cover and fish diversity even close to shore (Tanielu, 2014b, 2013; Tauati, 2015), and a high abundance of mullet, which potentially use this area as a feeding or spawning aggregation site (Aiafi, 2014; Sapatu, 2013b). However, bleaching was noticed among branching corals on the inner reef flat, rubble patches were recorded as an indication of past destructive fishing, and the appearance of crown-of-thorns starfish was noted in 2015. Protection and active management of this area is expected to support recovery from such impacts (Sapatu, 2013b; Tauati, 2015).

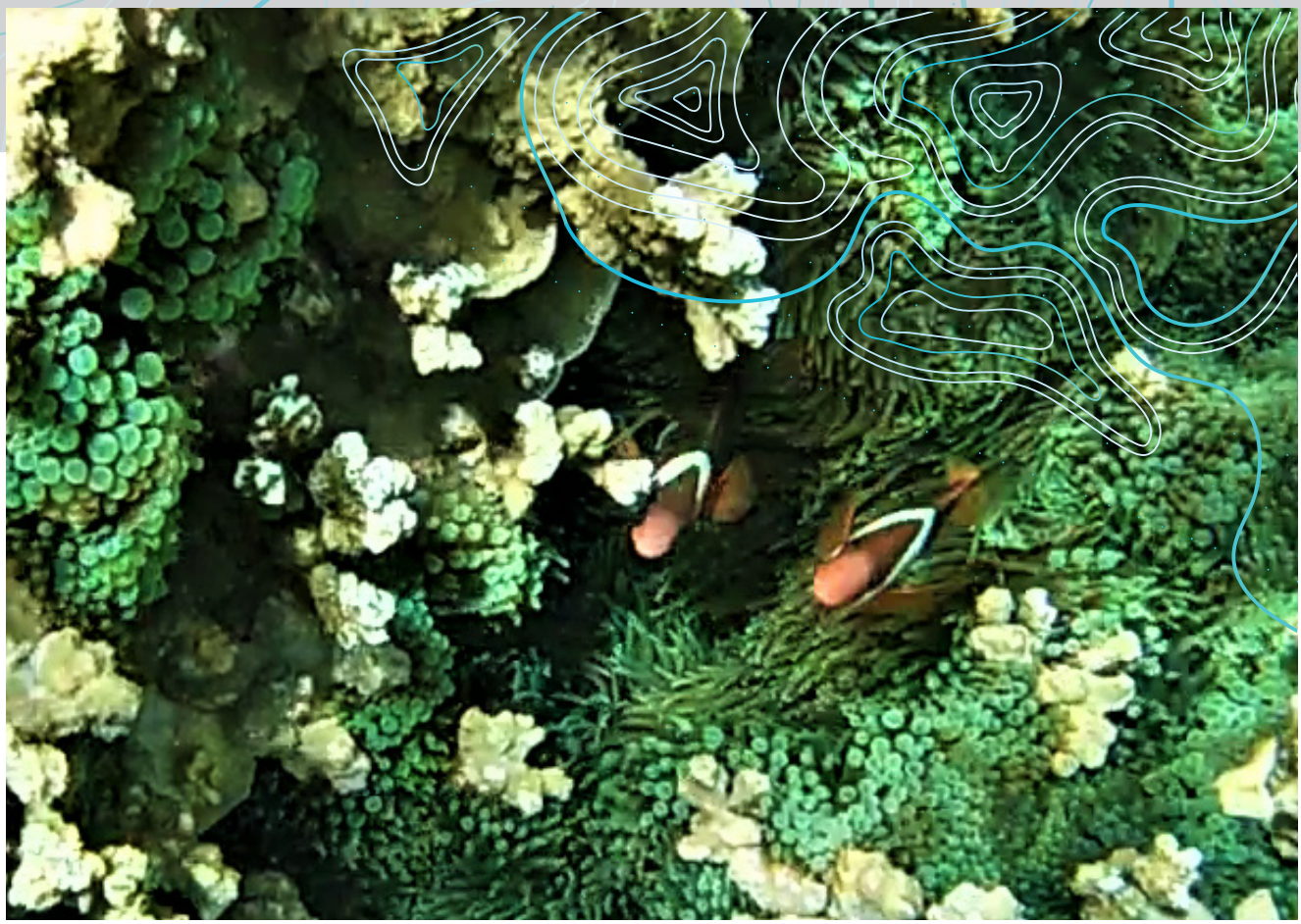
The benefits of fish reserves are presented in Site UI 3: Lufilufi/Faleapuna Community-Based Fish Reserve. The values relating to the importance of reserve networks mentioned in Site SI 6: Foailalo Community-Based Fish Reserve also apply here.

Type and number of sources (score = 2)

The sources used to discuss the values of local management of marine resources in general, and particularly in Samoa, in Site UI 3: Lufilufi/Faleapuna Community-Based Fish Reserve, are also relevant here. Thirteen reports mention this SUMA, including some information on the reserves, as well as three peer-reviewed papers and a number of protected area maps.

Obligations (score = 1)

The Fisheries Management Act 2016 prescribes a precautionary approach for management of fish stocks and the sustainable use of all aquatic resources. Establishing well-protected fish reserves is also a priority within the NAPA and NBSAP. The village fisheries by-laws provide for the conservation and management of the local environment, and for the management of community-based fish reserves.



7. Discussion

Workshop participants identified 44 special, unique marine areas (SUMAs), of which eleven were offshore and 32 were inshore sites. Through extensive background research and review of existing information, these sites were further refined into six offshore sites and 26 inshore sites (15 on Upolu Island and 11 on Savai'i). At the workshop consisting of experts, sites identified as SUMAs were given scores between 4 and 12. This scoring system was conducted systematically, albeit subjectively, and designed as a guide for future planning. A significant proportion of 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. Highest scoring sites, which have a more robust information base, can be prioritised with greater confidence. Furthermore, the scoring system is based upon information available at the time of writing and, as more information is gathered, the score of any site may change.

Samoa's offshore SUMAs received scores between 7 and 10.5 (see list of scores in Table 43). The absence of sites receiving the highest score of 12 reflected the general lack of information available for Samoa's offshore marine environments, rather than their intrinsic values. Additionally, the large-scale and remote nature of the sites prevented exact definition of geographic boundaries, except for discrete individual seamounts rising from the seabed. Clear site boundaries and robust background information are important for spatial planning, especially where the features requiring protection are located at great depths or determined by the movements or animals. The highest-scoring offshore site (Seamounts, ridges, guyots & escarpments, 10.5) was described in greater detail than most of the others. It was also morphologically highly complex, with a number of geomorphological features in close proximity. The lowest scoring site (Whale migration route, 7) presented almost no evidence to support its justification, as research on whale migration in Samoa has generally been conducted closer to the main islands.

The four highest-scoring inshore sites were Vaiusu Bay mangroves (10), Northwest Savai'i (10), Palolo Deep (11) and Five Mile Reef (12; see list of scores in Table 43). This resulted from a combination of site factors: clearly defined geography, availability of high-quality and directly relevant information, and patently special attributes. The Vaiusu Bay mangroves, despite all the pressures upon them, are still known as the largest mangrove stand in Polynesia. Northwest Savai'i included a mosaic of interconnected habitats in close proximity, which is well recognised as enhancing marine biodiversity, connectivity, productivity and resilience. Records of marine mammals frequenting the area also existed.

Palolo Deep is unique for its unusual lagoon system and well-documented macroalgal assemblages. Among Samoa's coral reefs, Five Mile Reef is distinctive for its offshore location, apart from the main fringing reef system around the island, and its isolation affords natural protection from some of the common pressures facing Samoa's coral reefs. Most of these high-scoring sites have already been recognised for their special attributes through various forms of protection, including restoration efforts (Vaiusu Bay mangroves), MPA status (Palolo Deep) and KBA status (Five Mile Reef, Palolo Deep).

Low-scoring sites (4-5) were those that had been selected for a single specific organism or attribute, or about which very little information was available. This indicates that both high and low scores are useful for management. For example, although no information about sharks in the "High shark area" (4.5) exists, this site should be prioritised for research to verify its high abundance of sharks. This would enable confident prioritisation of high-scoring sites for conservation and management, while highlighting lower-scoring sites for future research. These sites may also require protection for the purposes of ecosystem recovery or even restoration actions.

Some of the sites were given a special and/or unique status according to 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 leaves ecosystems relatively intact. For example, "Nu'utele and Nu'ulua bird nesting and foraging area" is relatively difficult to access, affording the nesting seabirds natural protection. Samoa has abundant coral reefs, but most are in poor condition due to heavy exploitation, pollution, natural impacts, and/or crown-of-thorns starfish outbreaks. A few are pristine due to their distance from human settlements. The reefs further offshore are more highly considered because the minimising of exploitation and pollution renders greater diversity and resilience, generating more abundant flora and fauna and intact food webs. Spatial planning can take this into account directly and 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.

Future scoring systems could take into account levels of human use or impact as this affects the intrinsic ecological value of a habitat, assemblage, population or ecosystem. The area's ecological value is embedded within its system's ability 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 whether 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 is one of the key steps in marine spatial planning (Ceccarelli *et al.*, 2018). This also provides a baseline of information for other management measures, in permitting or licencing or in Environmental Impact Assessments, from which the SUMAs may benefit. Sites with higher scores can be seen as priority sites at a national level, while those with lower scores should be highlighted for further research.

Table 43. Summary of special and/or unique marine sites in order of decreasing score
Offshore and inshore sites are rated separately

Code	Name	Location	Island	Geographic description	Justification	Sources	Obligations	Total
O1	Southern trench	Offshore	Offshore	2	1.5	3	2	**8.5**
O2	Seamounts, ridges, guyots & escarpments	Offshore	Offshore	2	2.5	3	3	**10.5**
O3	Geomorphological cluster 2	Offshore	Offshore	2	2	2.5	2	**8.5**
O4	Geomorphological cluster 3	Offshore	Offshore	2	2	2	2	**8**
O5	Eastern seamounts	Offshore	Offshore	1	2	3	2	**8**
O6	Whale migration route	Offshore	Offshore	1	1.5	2.5	2	**7**
UI1	Vaiusu Bay mangroves	Inshore	Upolu	2.5	1.5	3	3	**10**
UI2	Toamua-Fale'ula mangrove area	Inshore	Upolu	1	1.5	2	3	**7.5**
UI3	Lufilufi / Faleapuna Fish Reserve	Inshore	Upolu	2	1.5	2.5	2	**8**
UI4	Falgaloa Bay	Inshore	Upolu	3	1.5	3	1	**8.5**
UI5	Tiavea deeper area	Inshore	Upolu	1.5	1	1	1	**4.5**
UI6	Manono Reef Flats	Inshore	Upolu	2.5	2	3	2	**9.5**
UI7	Five Mile Reef	Inshore	Upolu	3	3	3	3	**12**
UI8	Apolima	Inshore	Upolu	2.5	1.5	2	2	**8**
UI9	Palolo Deep	Inshore	Upolu	3	2	3	3	**11**
UI10	Tiavea mangrove area	Inshore	Upolu	1	1	1	1	**4**
UI11	Nu'utele and Nu'ulua bird nesting and foraging area	Inshore	Upolu	2	1.5	3	1	**7.5**
UI12	Mutiatele mangrove area	Inshore	Upolu	1	1	1	1	**4**
UI13	Tuialamu Palolo site	Inshore	Upolu	1	1.5	1.5	1	**5**
UI14	Salani-Poutasi Reefs	Inshore	Upolu	1	1.5	1.5	1	**5**
UI15	Safata MPA	Inshore	Upolu	3	1.5	1.5	1	**7**
SI1	Northwest Savai'i	Inshore	Savai'i	1	3	3	3	**10**
SI2	Faletagaloa mangroves	Inshore	Savai'i	2	1	1.5	1	**5.5**
SI3	Safotu, Sasina and Safune Palolo harvesting area	Inshore	Savai'i	2	1.5	1	1	**5.5**
SI4	High shark area	Inshore	Savai'i	1	1	1.5	1	**4.5**
SI5	Satupa'itea to Fa'a'ala	Inshore	Savai'i	2.5	1	2	2	**7.5**
SI6	Foailalo Community-Based Fish Reserve	Inshore	Savai'i	3	1.5	1.5	1	**7**
SI7	Foailuga Community-Based Fish Reserve	Inshore	Savai'i	2	1.5	1.5	1	**6**
SI8	Sala'ilua CommunityBased Fish Reserve	Inshore	Savai'i	2	1.5	1.5	1	**6**
SI9	Satuiatua Community-Based Fish Reserve	Inshore	Savai'i	2	1.5	1.5	1	**6**
SI10	Palauli Community-Based Fish Reserves	Inshore	Savai'i	3	1.5	1.5	1	**7**
SI11	Multiple Community-Based Fish Reserves	Inshore	Savai'i	1	1.5	2	1	**5.5**

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9. Appendices

Appendix 1

List of workshop participants

NAME	ORGANISATION	Group	Area
Dr. Peter Davies	SPREP	Black	Inshore/Offshore
Hans Wendt	IUCN	Black	Inshore/Offshore
Dr. Saifaleupolu/Elisas	Le Siosiomaga Society	Black	Inshore/Offshore
Junior Poasa	MNRE	Black	Inshore/Offshore
Junior Hakai	MNRE	Black	Inshore/Offshore
Fatutolo Iene	MNRE	Green	Inshore/Offshore
Ueta Jr. Faasili	Fisheries, MAF	Green	Inshore/Offshore
Lionel Polataivao	MNRE	Green	Inshore/Offshore
Safotoga Tausagafou	MWCSD	Green	Inshore/Offshore
Danita Strickland	Conservation International	Green	Inshore/Offshore
Lilian J. Areta	Fisheries, MAF	Purple	Inshore/Offshore
Puna Luatimu	Fagalili Community-Based Fisheries Management	Purple	Inshore/Offshore
Unity Roebeck	Fisheries, MAF	Purple	Inshore/Offshore
Leilua Tavas Leota	Fagaloa Community-Based Fisheries Management	Purple	Inshore/Offshore
Peni Sua	Commercial Fishermen Association	Purple	Inshore/Offshore
Leiataua Eteuati	Commercial Fishermen Association	Purple	Inshore/Offshore
Atonio P. Mulipola	IUCN/MNRE/SUNGO	Orange	Inshore/Offshore
Chinnamma Reddy	IUCN	Orange	Inshore only
Karen Baird	SPREP	Orange	Inshore only

Appendix 2

Agenda for the Workshop on Biophysically Special, Unique Marine Areas in Samoa

WORKSHOP AGENDA: 04th March 2020

Venue: Sheraton Samoa Aggie Grey's Hotel & Bungalows, Main Beach Road – Apia, Samoa

Overall Objective

To identify and map the special and/or unique marine areas of Samoa:

- Confirm previous inshore priority sites (KBAs)
- Review current information to identify potential new inshore special, unique marine areas
- Review current information to identify offshore special, unique marine areas
- Map the boundaries of inshore and offshore special, unique marine areas
- Update participants about MSP Project

TIME	#	ACTIVITIES	PRESENTERS
9:00am	0	Registration	Workshop facilitator: Mr. Mulipola Atonio (Project Coordinator, MSP Project)
9:30am	1	Welcome Remarks	Mr. Mr. Seumalo Afele Faiilagi, ACEO, MNRE
9:45am	2	Opening Prayer	Rev. Poasa Lofipo, EFKS Tanugamanono
10:00am	3	Background on Samoa Ocean Strategy and Marine Spatial Planning in Samoa and how this workshop outputs will contribute to both (15 min)	Mr. Seumalo Afele, ACEO, MNRE, Division of Environment and Conservation
10:15am	4	Introductions a) Overview of meeting (objectives) b) Introductions of participants	Mr. Seumalo Afele, ACEO, MNRE, DEC
10:30am	5	Presentation on existing data (coral reefs, mangroves, bathymetry, geomorphology, EBSA, species richness, productivity, important bird areas, MPAs) (30 min)	IUCN GIS Team Hans Wendt and John Kaitu'u
10:45am	6	Presentation on current Priority Sites for Conservation in Samoa: Key Biodiversity Areas	Taiatu Maria R Satoa Principal Marine Biodiversity Conservation

11:00am	MORING TEA		
11:30am	7	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	IUCN Marine Program & Consultant
11:50am	8	Workshop process for identification of biophysically special, unique marine areas	Hans Wendt, IUCN Marine Program
12:00	9	Review current Priority areas / KBAs and identify new biophysically special, unique marine areas INSHORE	Break-out groups
1:30pm	LUNCH		
2:30pm	10	Feedback from groups	ALL
3:00pm	11	Assessment of biophysically special, unique marine areas OFFSHORE	Break-out groups
4:00pm	12	Feedback from groups	ALL
4:30pm	13	Reflections upon meeting expectations	ALL
4:45pm	14	Next steps and closing	Mr. Seumalo Afele (ACEO-MNRE)
5:00pm	15	Close	

Appendix 3

Biophysical data available during the workshop

Note: All datasets are open access.

Theme	Dataset Name	Source
Bathymetry	General Bathymetric Chart of the Oceans (GEBCO)	British Oceanographic Data Centre (BODC)
Bathymetry	General Bathymetric Chart of the Oceans (GEBCO) Gazetteer of Undersea Feature Names	http://www.ngdc.noaa.gov/gazetteer
Biology	Aquamaps - pelagic/benthic species richness	www.aquamaps.org
Biology	Coral Reefs 2010	UNEP WCMC
Biology	IMARS Millenium Coral Reef Mapping - Output Products	http://imars.marine.usf.edu/MC/output_south_pacific.html
Biology	Mangroves	UNEP WCMC
Biology	Mangroves 2010	UNEP WCMC
Boundaries	Ecologically and Biologically Significant Areas (EBSAs)	CBD
Boundaries	IMO MARPOL Boundaries	international maritime organisation
Boundaries	Provisional Exclusive Economic Zones (EEZs)	MarineRegions.org
Boundaries	World Database on Protected Areas	https://protectedplanet.net/
Economics	Submarine Cables	http://www.cablemap.info/
Geography	World Countries	https://www.arcgis.com/home/item.html?id=3864c63872d84ae-c91933618e3815dd2
Geomorphology	Global Seafloor Geomorphic Features Map	http://www.bluehabitats.org/
Oceanography	calcite concentration	http://www.oracle.ugent.be/
Oceanography	Chlorophyll Concentration	http://oceancolor.gsfc.nasa.gov/cms/
Oceanography	Cyclone Tracks [1842-2015]	https://www.ncdc.noaa.gov/ibtracs/index.php?name=ibtracs-data
Oceanography	dissolved oxygen	http://www.oracle.ugent.be/
Oceanography	Downwelling	Copernicus - Marine environment monitoring service
Oceanography	Mixed Layer Depth	http://www.marine.csiro.au/~dunn/cars2009/
Oceanography	nitrate concentration	http://www.oracle.ugent.be/
Oceanography	Particulate Inorganic Carbon	http://oceancolor.gsfc.nasa.gov/cms/
Oceanography	Particulate Organic Carbon	http://oceancolor.gsfc.nasa.gov/cms/
Oceanography	pH	http://www.oracle.ugent.be/
Oceanography	phosphate concentration	http://www.oracle.ugent.be/
Oceanography	photosynthetically available radiation	http://www.oracle.ugent.be/
Oceanography	salinity	http://www.oracle.ugent.be/
Oceanography	Sea Surface Temperature	http://oceancolor.gsfc.nasa.gov/cms/
Oceanography	silicate concentration	http://www.oracle.ugent.be/
Oceanography	Upwelling	Copernicus - Marine environment monitoring service
Risks	Centennial Earthquake Catalog	http://earthquake.usgs.gov/data/centennial/
Risks	Pollution Incident Intensity	SPREP

Appendix 4

Workshop Site Response Sheet

Samoa Biophysically Special, Unique Marine Areas Workshop - 04 March 2020

WORKSHEET

Group: Site number:

Site name:

Location geographic description:

Justification:

Sources:

Any legal obligations:

Follow-ups:

List of biophysical maps available in hardcopy

- Overview Map of the Samoa
- SM Bathymetry EEZ (including coastlines)
- SM Geomorphology EEZ
- SM Seamounts EEZ
- SM Seamounts Classification EEZ
- SM Hydrothermal Vents EEZ
- SM Mangroves, Seagrasses and Reefs
- SM Sea Surface Temperatures (SST) EEZ
- SM Chlorophyll-A concentration EEZ
- SM Ocean Productivity EEZ
- SM Upwelling EEZ
- SM Downwelling EEZ
- SM Particulate Organic Carbon flux EEZ
- SM Ocean Surface Currents EEZ
- SM Coral Species Richness EEZ
- SM Turtle Research and Monitoring Database System (TREDS) EEZ
- SM Marine Species Richness (Aquamaps) EEZ
- SM Benthic Marine Species Richness (Aquamaps) EEZ
- SM Pelagic Marine Species Richness (Aquamaps) EEZ
- SM Coldwater Coral Habitat Suitability EEZ
- SM Ecologically and Biologically significant Areas (EBSAs)
- SM Key Biodiversity Areas (KBAs) and Islandscapes EEZ
- SM Important Bird and Biodiversity Areas (IBAs)
- SM Marine Managed Areas

List of Biophysical Maps and Other Data available in GIS

- All of the above
- SM Mixed Layer Depth EEZ
- SM Photosynthetically Available Radiation EEZ
- SM Dissolved Oxygen Concentration EEZ
- SM Particulate Inorganic Carbon Flux EEZ
- SM Phosphate EEZ
- SM pH EEZ
- SM silicate EEZ
- SM Earthquakes EEZ
- SM Front Count EEZ
- SM Frontal Index EEZ
- SM Marine Pollution Incidents EEZ
- SM Nitrate EEZ
- SM Reefs At Risk EEZ
- SM Historic Tsunamis Location EEZ
- SM Historic Earthquakes Location EEZ
- Mean Annual Phytoplankton Concentration EEZ
- SM Diffuse Attenuation Coefficient (per meter of depth) EEZ

List of maps for participants to draw upon

Offshore maps

- Samoa Northern Region Map
- Samoa Southern Region Map

Inshore maps

Upolu Island

- Lauli'i-Sauago region map
- Leulumoega-Vailele region map
- Poutasi-Aufaga region map
- Salamumu-Sa'agafou region map
- Salimu-Tiavea region map
- Savaia-Faleolo region map
- Tiavea-Aufaga region map

Savai'i Island

- A'opo-Safotu region map
- Fagafau-Sagone region map
- Falealupo region map
- Foailalo-Sili region map
- Pu'apu'a-Salelologa map
- Safune-Patamea map
- Satupaitea-Tafua-tai region map

Appendix 5

List of species known to occur in Samoa with international and national obligations

The species list was generated through a country-specific and region-specific search of Species + (www.speciesplus.net) and the IUCN Red List of Threatened Species (www.iucnredlist.org). This table was used to verify the obligations for each site, where particular species were known to occur at the site. The distribution of each species is based on current IUCN listings and may be subject to change. 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; WCPFC CMM: Western and Central Pacific Fisheries Commission Conservation and Management Measures; DD: Data Deficient; LC: Least Concern; NT: Near Threatened; VU: Vulnerable; EN: Endangered.

Kingdom	Family	Scientific Name	Common Name	IUCN	CITES	CMS	EU Listing	Distribution
Animalia	Palinuridae	*Panulirus penicillatus*	Pronghorn spiny lobster	LC				Global
Animalia	Scyllaridae	*Parribacus antarcticus*	Sculptured mitten lobster	LC				Global
Animalia	Scyllaridae	*Parribacus caledonicus*	Caledonian mitten lobster	LC				Pacific
Animalia	Anguillidae	*Anguilla marmorata*	Marbled eel	LC				Indo-Pacific
Animalia	Anguillidae	*Anguilla megastoma*	Pacific long-finned eel	DD				Pacific
Animalia	Anguillidae	*Anguilla obscura*	Pacific shortfin eel	DD				Pacific
Animalia	Chlopsidae	*Kaupichthys brachychirus*	Shortfin false moray	LC				Indo-Pacific
Animalia	Congridae	*Ariosoma fasciatum*	Barred sand conger	LC				Global
Animalia	Congridae	*Ariosoma mauritianum*	Blunt-tooth conger	LC				Indo-Pacific
Animalia	Congridae	*Ariosoma scheelei*	Tropical conger	LC				Global
Animalia	Congridae	*Bathycongrus odontostomus*	Toothy conger	LC				Indo-Pacific
Animalia	Congridae	*Conger cinereus*	Ashen conger eel	LC				Global
Animalia	Congridae	*Congriscus maldivensis*	Conger eel	LC				Indo-Pacific
Animalia	Congridae	*Gorgasia galzini*	Speckled garden-eel	LC				Pacific
Animalia	Congridae	*Heteroconger hassi*	Spotted garden-eel	LC				Indo-Pacific
Animalia	Muraenidae	*Anarchias allardicei*	Allardice's moray	LC				Indo-Pacific
Animalia	Muraenidae	*Anarchias seychellensis*	Seychelles moray	LC				Indo-Pacific
Animalia	Muraenidae	*Echidna leucotaenia*	White-banded moray eel	LC				Global
Animalia	Muraenidae	*Echidna nebulosa*	Snowflake eel	LC				Global
Animalia	Muraenidae	*Echidna polyzona*	Barred moray	LC				Global
Animalia	Muraenidae	*Echidna unicolor*	Pale moray	LC				Indo-Pacific
Animalia	Muraenidae	*Enchelycore bayeri*	Bowmouth moray	LC				Global
Animalia	Muraenidae	*Enchelycore bikiniensis*	Bikini moray	LC				Pacific
Animalia	Muraenidae	*Enchelycore schismatorhynchus*	White-margined moray	LC				Indo-Pacific
Animalia	Muraenidae	*Gymnomuraena zebra*	Zebra moray	LC				Global
Animalia	Muraenidae	*Gymnothorax albimarginatus*	White-edged moray	LC				Indo-Pacific
Animalia	Muraenidae	*Gymnothorax buroensis*	Buro moray	LC				Global
Animalia	Muraenidae	*Gymnothorax chilospilus*	Lipspot moray	LC				Global

Animalia	Muraenidae	*Gymnothorax elegans*	Goldsborough's moray eel	LC				Global
Animalia	Muraenidae	*Gymnothorax enigmaticus*	Enigmatic moray eel	LC				Indo-Pacific
Animalia	Muraenidae	*Gymnothorax fimbriatus*	Fimbriated moray	LC				Indo-Pacific
Animalia	Muraenidae	*Gymnothorax flavimarginatus*	Yellow edged moray	LC				Global
Animalia	Muraenidae	*Gymnothorax fuscomaculatus*	Freckled moray	LC				Indo-Pacific
Animalia	Muraenidae	*Gymnothorax gracilicauda*	Slendertail moray	LC				Indo-Pacific
Animalia	Muraenidae	*Gymnothorax javanicus*	Giant moray	LC				Global
Animalia	Muraenidae	*Gymnothorax margaritophorus*	Blackpearl moray	LC				Indo-Pacific
Animalia	Muraenidae	*Gymnothorax melatremus*	Golden moray	LC				Indo-Pacific
Animalia	Muraenidae	*Gymnothorax meleagris*	Painted moray	LC				Indo-Pacific
Animalia	Muraenidae	*Gymnothorax monostigma*	One-spot moray	LC				Indo-Pacific
Animalia	Muraenidae	*Gymnothorax pictus*	Bar-cheeked eel	LC				Global
Animalia	Muraenidae	*Gymnothorax pindae*	Pinda moray	LC				Indo-Pacific
Animalia	Muraenidae	*Gymnothorax richardsonii*	Richnardson's moray	LC				Indo-Pacific
Animalia	Muraenidae	*Gymnothorax rueppelliae*	Rueppel's moray eel	LC				Global
Animalia	Muraenidae	*Gymnothorax thyrsoideus*	Greyface moray	LC				Indo-Pacific
Animalia	Muraenidae	*Gymnothorax undulatus*	Undulated moray	LC				Global
Animalia	Muraenidae	*Gymnothorax zonipectis*	Barred-fin moray	LC				Indo-Pacific
Animalia	Muraenidae	*Pseudechidna brummeri*	Brummer's moray	LC				Indo-Pacific
Animalia	Muraenidae	*Scuticaria tigrina*	Spotted snake moray	LC				Global
Animalia	Muraenidae	*Uropterygius concolor*	Brown moray eel	LC				Global
Animalia	Muraenidae	*Uropterygius fuscoguttatus*	Brown snake moray eel	LC				Indo-Pacific
Animalia	Muraenidae	*Uropterygius macrocephalus*	Largehead moray	LC				Global
Animalia	Muraenidae	*Uropterygius marmoratus*	Marbled moray	LC				Indo-Pacific
Animalia	Muraenidae	*Uropterygius micropterus*	Short-finned reef-eel	LC				Global
Animalia	Muraenidae	*Uropterygius polyspilus*	Large spotted snake moray	LC				Global
Animalia	Muraenidae	*Uropterygius supraforatus*	Many toothed snake moray	LC				Indo-Pacific
Animalia	Muraenidae	*Uropterygius xanthopterus*	Freckleface reef eel	LC				Indo-Pacific
Animalia	Muraenidae	*Uropterygius xenodontus*	Strange toothed snake moray	LC				Pacific
Animalia	Nemichthyidae	*Nemichthys scolopaceus*	Slender snipe eel	LC				Global

Animalia	Ophichthidae	*Lamnostoma polyophthalma*	Ocellated sand eel	LC				Possibly extinct in Samoa
Animalia	Serrivomeridae	*Stemonidium hypomelas*	Black serrivomerid eel	LC				Global
Animalia	Atherinidae	*Atherion elymus*	Bearded silverside	LC				Indo-Pacific
Animalia	Alepisauridae	*Alepisaurus brevirostris*	Short snouted lancetfish	LC				Uncertain
Animalia	Alepisauridae	*Alepisaurus ferox*	Long snouted lancetfish	LC				Uncertain
Animalia	Evermannellidae	*Coccorella atrata*	Black sabretooth	LC				Indo-Pacific
Animalia	Evermannellidae	*Evermannella indica*	Indian sabretooth	LC				Global
Animalia	Evermannellidae	*Evermannella megalops*	Sabretooth	LC				Pacific
Animalia	Evermannellidae	*Odontostomops normalops*	Undistinguished sabretooth	LC				Global
Animalia	Giganturidae	*Gigantura indica*	Telescopefish	LC				Global
Animalia	hlorophthalmidae	*Chlorophthalmus agassizi*	Agassiz's threadsail fish	LC				Global
Animalia	Ipnopidae	*Ipnops meadi*	Deep-sea tripod fish	LC				Global
Animalia	Notosudidae	*Ahliesaurus berryi*	Waryfish	LC				Global
Animalia	Notosudidae	*Ahliesaurus brevis*	Waryfish	LC				Global
Animalia	Notosudidae	*Scopelosaurus hoedti*	Hoedt's waryfish	LC				Indo-Pacific
Animalia	Notosudidae	*Scopelosaurus smithii*	Waryfish	LC				Global
Animalia	Omosudidae	*Omosudis lowii*	Hammerjaw	LC				Global
Animalia	Paralepididae	*Lestidiops mirabilis*	Strange pike smelt	LC				Global
Animalia	Paralepididae	*Lestrolepis intermedia*	Barracudina	LC				Global
Animalia	Paralepididae	*Macroparalepis danae*	Dana black barracudina	LC				Pacific
Animalia	Paralepididae	*Magnisudis atlantica*	Duckbill barracudina	LC				Global
Animalia	Paralepididae	*Paralepis elongata*	Barracudina	LC				Global
Animalia	Paralepididae	*Stemonosudis elegans*	Tailspot barracudina	LC				Global
Animalia	Paralepididae	*Stemonosudis elongata*	Elongate barracudina	LC				Indo-Pacific
Animalia	Paralepididae	*Stemonosudis macrura*	Big tail barracudina	LC				Global
Animalia	Paralepididae	*Sudis atrox*	Fierce pike smelt	LC				Global
Animalia	Scopelarchidae	*Benthalbella infans*	Zugmayer's pearleye	LC				Global
Animalia	Scopelarchidae	*Rosenblattichthys alatus*	Winged pearleye	LC				Indo-Pacific
Animalia	Scopelarchidae	*Scopelarchoides danae*	Dana pearleye	LC				Global
Animalia	Scopelarchidae	*Scopelarchoides signifer*	Pearleye	LC				Indo-Pacific

Animalia	Scopelarchidae	*Scopelarchus analis*	Blackbelly pearleye	LC				Global
Animalia	Scopelarchidae	*Scopelarchus guentheri*	Staring pearleye	LC				Global
Animalia	Snakefish	*Trachinocephalus myops*	Snakefish	LC				Global
Animalia	Synodontidae	*Saurida gracilis*	Gracile lizardfish	LC				Indo-Pacific
Animalia	Synodontidae	*Synodus binotatus*	Two-spot lizardfish	LC				Global
Animalia	Synodontidae	*Synodus dermatogenys*	Sand lizardfish	LC				Global
Animalia	Synodontidae	*Synodus jaculum*	Lighthouse lizardfish	LC				Uncertain (AS)
Animalia	Synodontidae	*Synodus variegatus*	Variegated lizardfish	LC				Global
Animalia	Belonidae	*Ablennes hians*	Flat needlefish	LC				Global
Animalia	Belonidae	*Platybelone argalus platyura*	Keeltail needlefish	LC				Uncertain
Animalia	Belonidae	*Tylosurus crocodilus*	Hound needlefish	LC				Global
Animalia	Exocoetidae	*Cheilopogon furcatus*	Spotfin flying fish	LC				Global
Animalia	Exocoetidae	*Cheilopogon heterurus*	Blotchwing flying fish	LC				Global
Animalia	Exocoetidae	*Exocoetus volitans*	Tropical two-wing flyingfish	LC				Global
Animalia	Exocoetidae	*Hirundichthys speculiger*	Mirrorwing flying fish	LC				Global
Animalia	Hemiramphidae	*Zenarchopterus dispar*	Feathered river-garfish	LC				Indo-Pacific
Animalia	Anomalopidae	*Anomalops katoptron*	Splitfin flashlight fish	LC				Indo-Pacific
Animalia	Anomalopidae	*Photoblepharon palpebratum*	Eyelight fish	LC				Indo-Pacific
Animalia	Anoplogastridae	*Anoplogaster cornuta*	Common fangtooth	LC				Global
Animalia	Berycidae	*Beryx decadactylus*	Alfonsino	LC				Global
Animalia	Berycidae	*Beryx splendens*	Splendid alfonsino	LC				Global
Animalia	Ditremidae	*Diretmus argenteus*	Silver spinyfish	LC				Global
Animalia	Holocentridae	*Myripristis adusta*	Shadowfin soldierfish	LC				Pacific
Animalia	Holocentridae	*Myripristis amaena*	Brick soldierfish	LC				Global
Animalia	Holocentridae	*Myripristis berndti*	Blotcheye soldierfish	LC				Global
Animalia	Holocentridae	*Myripristis chryseres*	Yellowfin soldierfish	LC				Indo-Pacific
Animalia	Holocentridae	*Myripristis hexagona*	Doubletooth soldierfish	LC				Indo-Pacific
Animalia	Holocentridae	*Myripristis kuntee*	Shoulderbar soldierfish	LC				Indo-Pacific
Animalia	Holocentridae	*Myripristis murdjan*	Pinecone soldierfish	LC				Global
Animalia	Holocentridae	*Myripristis pralinia*	Big eye soldierfish	LC				Indo-Pacific

Animalia	Holocentridae	*Myripristis randalli*	Soldierfish	LC				Pacific
Animalia	Holocentridae	*Myripristis violacea*	Lattice soldierfish	LC				Indo-Pacific
Animalia	Holocentridae	*Myripristis vittata*	Whitetip soldierfish	LC				Indo-Pacific
Animalia	Holocentridae	*Myripristis woodsi*	Whitespot soldierfish	LC				Pacific
Animalia	Holocentridae	*Neoniphon argenteus*	Clearfin squirrelfish	LC				Indo-Pacific
Animalia	Holocentridae	*Neoniphon opercularis*	Blackfin squirrelfish	LC				Indo-Pacific
Animalia	Holocentridae	*Neoniphon sammara*	Sammara squirrelfish	LC				Global
Animalia	Holocentridae	*Ostichthys delta*	Redcoat	DD				Indo-Pacific
Animalia	Holocentridae	*Ostichthys kaianus*	Kai soldierfish	LC				Indo-Pacific
Animalia	Holocentridae	*Plectrypops lima*	Shy soldier	LC				Global
Animalia	Holocentridae	*Sargocentron caudimaculatum*	Silverspot squirrelfish	LC				Global
Animalia	Holocentridae	*Sargocentron diadema*	Crown squirrelfish	LC				Global
Animalia	Holocentridae	*Sargocentron ensifer*	Yellow-striped squirrelfish	LC				Pacific
Animalia	Holocentridae	*Sargocentron ittodai*	Samurai squirrelfish	LC				Global
Animalia	Holocentridae	*Sargocentron lepros*	Spiny squirrelfish	LC				Pacific
Animalia	Holocentridae	*Sargocentron melanospilos*	Blackblotch squirrelfish	LC				Indo-Pacific
Animalia	Holocentridae	*Sargocentron microstoma*	Smallmouth squirrelfish	LC				Indo-Pacific
Animalia	Holocentridae	*Sargocentron praslin*	Dark-striped squirrelfish	LC				Indo-Pacific
Animalia	Holocentridae	*Sargocentron punctatissimum*	Speckled squirrelfish	LC				Global
Animalia	Holocentridae	*Sargocentron spiniferum*	Sabre squirrelfish	LC				Global
Animalia	Holocentridae	*Sargocentron tiere*	Blue lined squirrelfish	LC				Indo-Pacific
Animalia	Holocentridae	*Sargocentron tiereoides*	Pink squirrelfish	LC				Indo-Pacific
Animalia	Holocentridae	*Sargocentron violaceum*	Violet squirrelfish	LC				Indo-Pacific
Animalia	Barbourisiidae	*Barbourisia rufa*	Redvelvet whalefish	LC				Global
Animalia	Cetomimidae	*Cetostoma regani*	Pink flabby whalefish	DD				Global
Animalia	Cetomimidae	*Ditropichthys storeri*	Doublekeeled whalefish	DD				Global
Animalia	Cetomimidae	*Eutaeniophorus festivus*	Festive ribbonfish	LC				Global
Animalia	Rondeletiidae	*Rondeletia bicolor*	Redmouth whalefish	LC				Global
Animalia	Rondeletiidae	*Rondeletia loricata*	Redmouth whalefish	LC				Global
Animalia	Clupeidae	*Herklotsichthys quadrimaculatus*	Bluestripe herring	LC				Global

Animalia	Clupeidae	*Sardinella melanura*	Blacktip sardinella	LC				Indo-Pacific
Animalia	Clupeidae	*Spratelloides atrofasciatus*	Silver-stripe round herring	LC				Uncertain (AS)
Animalia	Clupeidae	*Spratelloides delicatulus*	Delicate round herring	LC				Global
Animalia	Engraulidae	*Encrasicholina heteroloba*	Shorthead anchovy	LC				Global
Animalia	Engraulidae	*Encrasicholina punctifer*	Buccaneer anchovy	LC				Indo-Pacific
Animalia	Engraulidae	*Stolephorus apiensis*	Samoan anchovy	LC				Restricted (Fiji; Samoa)
Animalia	Elopidae	*Elops hawaiensis*	Giant herring	DD				Indo-Pacific
Animalia	Megalopidae	*Megalops cyprinoides*	Indo-Pacific tarpon	DD				Global
Animalia	Macrouridae	*Hymenocephalus aterrimus*	Blackest whiptail	LC				Global
Animalia	Macrouridae	*Malacocephalus laevis*	Softhead grenadier	LC				Global
Animalia	Moridae	*Antimora rostrata*	Flatnose codling	LC				Global
Animalia	Fistulariidae	*Fistularia commersonii*	Bluespotted cornetfish	LC				Global
Animalia	Fistulariidae	*Fistularia petimba*	Red cornetfish	LC				Global
Animalia	Gobiesocidae	*Lepadichthys frenatus*	Clingfish	LC				Pacific
Animalia	Gobiesocidae	*Lepadichthys minor*	Dwarf clingfish	LC				Indo-Pacific
Animalia	Chanidae	*Chanos chanos*	Milkfish	LC				Global
Animalia	Lophotidae	*Lophotus capellei*	North Pacific crestfish	LC				Indo-Pacific
Animalia	Radiicephalidae	*Radiicephalus elongatus*	Tapertail	LC				Global
Animalia	Regalecidae	*Regalecus glesne*	Oarfish	LC				Global
Animalia	Stylephoridae	*Stylephorus chordatus*	Tube-eye	LC				Global
Animalia	Trachipteridae	*Desmodema polystictum*	Polka-dot ribbonfish	LC				Global
Animalia	Trachipteridae	*Zu cristatus*	Scalloped ribbonfish	LC				Global
Animalia	Antennariidae	*Antennarius analis*	Dwarf frogfish	LC				Indo-Pacific
Animalia	Antennariidae	*Antennatus nummifer*	Bigspot angler	LC				Global
Animalia	Antennariidae	*Histrio histrio*	Sargassum fish	LC				Global
Animalia	Caulophrynidae	*Caulophryne jordani*	Fanfin angler	LC				Global
Animalia	Ceratiidae	*Ceratias holboelli*	Deep-sea angler	LC				Global
Animalia	Chaunacidae	*Chaunax penicillatus*	Fluffylure frogmouth	LC				Indo-Pacific
Animalia	Gigantactinidae	*Rhynchactis macrothrix*	Whipnose angler	DD				Global
Animalia	Linophrynidae	*Linophryne densiramus*	Bearded angler	LC				Global

Animalia	Melanocetidae	*Melanocetus johnsonii*	Humpback anglerfish	LC				Global
Animalia	Melanocetidae	*Melanocetus murrayi*	Murray's abyssal anglerfish	LC				Global
Animalia	Neoceratiidae	*Neoceratias spinifer*	Spiny seadevil	LC				Global
Animalia	Ogcocephalidae	*Halieutaea stellata*	Starry seabat	LC				Indo-Pacific
Animalia	Oneirodidae	*Chaenophryne draco*	Smooth dreamer	LC				Global
Animalia	Oneirodidae	*Chaenophryne longiceps*	Can-opener smoothdream	LC				Uncertain
Animalia	Oneirodidae	*Chaenophryne ramifera*	Dreamer	LC				Global
Animalia	Oneirodidae	*Danaphryne nigrifilis*	Blackthread dreamer	LC				Global
Animalia	Oneirodidae	*Lophodolos indicus*	Dreamer	LC				Uncertain
Animalia	Oneirodidae	*Microlophichthys microlophus*	Short-rod anglerfish	LC				Global
Animalia	Oneirodidae	*Oneirodes eschrichtii*	Bulbous dreamer	LC				Global
Animalia	Mugilidae	*Crenimugil crenilabis*	Fringelip mullet	LC				Global
Animalia	Mugilidae	*Osteomugil engeli*	Kanda	LC				Indo-Pacific
Animalia	Myctophidae	*Benthosema fibulatum*	Spinycheek lanternfish	LC				Global
Animalia	Myctophidae	*Bolinichthys distofax*	Lanternfish	LC				Global
Animalia	Myctophidae	*Bolinichthys longipes*	Popeye lanternfish	LC				Global
Animalia	Myctophidae	*Bolinichthys nikolayi*	Nikolay's lanternfish	LC				Pacific
Animalia	Myctophidae	*Bolinichthys photothorax*	Spurcheek lanternfish	LC				Global
Animalia	Myctophidae	*Centrobranchus andreae*	Andre's lanternfish	LC				Indo-Pacific
Animalia	Myctophidae	*Centrobranchus choerocephalus*	Lanternfish	LC				Indo-Pacific
Animalia	Myctophidae	*Centrobranchus nigroocellatus*	Roundnose lanternfish	LC				Global
Animalia	Myctophidae	*Ceratoscopelus townsendi*	Dogtooth lampfish	LC				Global
Animalia	Myctophidae	*Ceratoscopelus warmingii*	Warming's lanternfish	LC				Global
Animalia	Myctophidae	*Dasyscopelus brachygnathos*	Lanternfish	LC				Indo-Pacific
Animalia	Myctophidae	*Diaphus aliciae*	Alice's lanternfish	LC				Global
Animalia	Myctophidae	*Diaphus anderseni*	Andersen's lanternfish	LC				Global
Animalia	Myctophidae	*Diaphus brachycephalus*	Short-headed lanternfish	LC				Global
Animalia	Myctophidae	*Diaphus effulgens*	Headlight fish	LC				Global
Animalia	Myctophidae	*Diaphus fragilis*	Fragile lanternfish	LC				Global
Animalia	Myctophidae	*Diaphus fulgens*	Lanternfish	LC				Global

Animalia	Myctophidae	*Diaphus jenseni*	Jensen's lanternfish	LC				Indo-Pacific
Animalia	Myctophidae	*Diaphus luetkeni*	Luetken's lanternfish	LC				Global
Animalia	Myctophidae	*Diaphus malayanus*	Malayan lanternfish	LC				Indo-Pacific
Animalia	Myctophidae	*Diaphus metopoclampus*	Spothead lanternfish	LC				Global
Animalia	Myctophidae	*Diaphus mollis*	Soft lanternfish	LC				Global
Animalia	Myctophidae	*Diaphus nielseni*	Lanternfish	LC				Indo-Pacific
Animalia	Myctophidae	*Diaphus parri*	Parr's lanternfish	LC				Indo-Pacific
Animalia	Myctophidae	*Diaphus perspicillatus*	Transparent lanternfish	LC				Global
Animalia	Myctophidae	*Diaphus phillipsi*	Bolin's lanternfish	LC				Indo-Pacific
Animalia	Myctophidae	*Diaphus regani*	Regan's lanternfish	LC				Indo-Pacific
Animalia	Myctophidae	*Diaphus schmidti*	Lanternfish	LC				Indo-Pacific
Animalia	Myctophidae	*Diaphus signatus*	Lanternfish	LC				Indo-Pacific
Animalia	Myctophidae	*Diaphus splendidus*	Horned lanternfish	LC				Global
Animalia	Myctophidae	*Diaphus thiollierei*	Thiolliere's lanternfish	LC				Indo-Pacific
Animalia	Myctophidae	*Diogenichthys atlanticus*	Longfin lanternfish	LC				Global
Animalia	Myctophidae	*Gonichthys venetus*	Lanternfish	LC				Global
Animalia	Myctophidae	*Hygophum proximum*	Firefly lanternfish	LC				Indo-Pacific
Animalia	Myctophidae	*Lampadena luminosa*	Luminous lanternfish	LC				Global
Animalia	Myctophidae	*Lampanyctus crypticus*	Cryptic lanternfish	LC				Global
Animalia	Myctophidae	*Lampanyctus festivus*	Festive lanternfish	LC				Global
Animalia	Myctophidae	*Lampanyctus hubbsi*	Lanternfish	LC				Pacific
Animalia	Myctophidae	*Lampanyctus niger*	Black lanternfish	LC				Indo-Pacific
Animalia	Myctophidae	*Lampanyctus nobilis*	Noble lanternfish	LC				Global
Animalia	Myctophidae	*Lampanyctus steinbecki*	Longfin lampfish	LC				Global
Animalia	Myctophidae	*Lampanyctus tenuiformis*	Slender lanternfish	LC				Global
Animalia	Myctophidae	*Lobianchia gemellarii*	Cocco's lanternfish	LC				Global
Animalia	Myctophidae	*Myctophum asperum*	Prickly lanternfish	LC				Global
Animalia	Myctophidae	*Myctophum aurolaternatum*	Golden lanternfish	LC				Global
Animalia	Myctophidae	*Myctophum nitidulum*	Spotted lanternfish	LC				Global
Animalia	Myctophidae	*Myctophum obtusirostre*	Bluntsnout lanternfish	LC				Global

Animalia	Myctophidae	*Myctophum selenops*	Wisner's lanternfish	LC				Global
Animalia	Myctophidae	*Nannobrachium lineatum*	Lanternfish	LC				Global
Animalia	Myctophidae	*Notolychnus valdiviae*	Topside lampfish	LC				Global
Animalia	Myctophidae	*Symbolophorus evermanni*	Evermann's lanternfish	LC				Global
Animalia	Myctophidae	*Taaningichthys bathyphilus*	Deep-water lanternfish	LC				Global
Animalia	Myctophidae	*Triphoturus nigrescens*	High seas lampfish	LC				Global
Animalia	Neoscopelidae	*Neoscopelus macrolepidotus*	Largescaled neoscopelid	LC				Global
Animalia	Neoscopelidae	*Neoscopelus microchir*	Shortfin neoscopelid	LC				Global
Animalia	Halosauridae	*Aldrovandia affinis*	Allied halosaur	LC				Global
Animalia	Bythitidae	*Brosmophyciops pautzkei*	Slimy cusk-eel	LC				Global
Animalia	Bythitidae	*Ematops randalli*	Randall's viviparous brotula	LC				Indo-Pacific
Animalia	Bythitidae	*Saccogaster tuberculata*	Bagbelly cusk	LC				Indo-Pacific
Animalia	Carapidae	*Carapus mourlani*	Star pearlfish	LC				Global
Animalia	Carapidae	*Encheliophis boraborensis*	Pinhead pearlfish	LC				Indo-Pacific
Animalia	Carapidae	*Encheliophis gracilis*	Slender pearlfish	LC				Global
Animalia	Carapidae	*Encheliophis homei*	Silver pearlfish	LC				Global
Animalia	Carapidae	*Onuxodon fowleri*	Fowler's pearlfish	LC				Indo-Pacific
Animalia	Carapidae	*Onuxodon parvibrachium*	Oyster pearlfish	LC				Indo-Pacific
Animalia	Carapidae	*Pyramodon ventralis*	Pallid pearlfish	LC				Indo-Pacific
Animalia	Dinematichthyidae	*Alionematichthys crassiceps*	Bighead viviparous brotula	LC				Indo-Pacific
Animalia	Dinematichthyidae	*Alionematichthys piger*	Whiskered viviparous brotula	LC				Restricted
Animalia	Dinematichthyidae	*Alionematichthys samoaensis*	Samoa viviparous brotula	LC				Global
Animalia	Dinematichthyidae	*Diancistrus alleni*	Allen's coralbrotula	LC				Indo-Pacific
Animalia	Dinematichthyidae	*Diancistrus tongaensis*	Tonga coralbrotula	LC				Pacific
Animalia	Ophidiidae	*Abyssobrotula galatheae*	Cusk-eel	LC				Global
Animalia	Ophidiidae	*Brotula multibarbata*	Pacific bearded brotula	LC				Global
Animalia	Ophidiidae	*Brotula townsendi*	Townsend's cusk-eel	LC				Pacific
Animalia	Ophidiidae	*Xyelacyba myersi*	Gargoyle cusk-eel	LC				Global
Animalia	Alepocephalidae	*Photostylus pycnopterus*	Starry smoothhead	LC				Global
Animalia	Opisthoproctidae	*Opisthoproctus grimaldii*	Mirrorbelly	LC				Uncertain (AS)

Animalia	Acanthuridae	*Acanthurus achilles*	Achilles tang	LC				Indo-Pacific
Animalia	Acanthuridae	*Acanthurus albipectoralis*	Whitefin surgeonfish	LC				Pacific
Animalia	Acanthuridae	*Acanthurus auranticavus*	Orange-socket surgeonfish	LC				Uncertain (AS)
Animalia	Acanthuridae	*Acanthurus blochii*	Ringtail surgeonfish	LC				Global
Animalia	Acanthuridae	*Acanthurus guttatus*	Whitespotted surgeonfish	LC				Indo-Pacific
Animalia	Acanthuridae	*Acanthurus lineatus*	Lined surgeonfish	LC				Global
Animalia	Acanthuridae	*Acanthurus maculiceps*	Spotted-face surgeonfish	LC				Indo-Pacific
Animalia	Acanthuridae	*Acanthurus mata*	Elongate surgeonfish	LC				Global
Animalia	Acanthuridae	*Acanthurus nigricans*	Whitecheek surgeonfish	LC				Global
Animalia	Acanthuridae	*Acanthurus nigricauda*	Epaulette surgeonfish	LC				Indo-Pacific
Animalia	Acanthuridae	*Acanthurus nigrofuscus*	Brown surgeonfish	LC				Indo-Pacific
Animalia	Acanthuridae	*Acanthurus olivaceus*	Orangespot surgeonfish	LC				Indo-Pacific
Animalia	Acanthuridae	*Acanthurus pyroferus*	Mimic surgeonfish	LC				Indo-Pacific
Animalia	Acanthuridae	*Acanthurus thompsoni*	Thompson's surgeonfish	LC				Indo-Pacific
Animalia	Acanthuridae	*Acanthurus triostegus*	Convict tang	LC				Global
Animalia	Acanthuridae	*Acanthurus xanthopterus*	Yellowfin surgeonfish	LC				Global
Animalia	Acanthuridae	*Ctenochaetus binotatus*	Twospot bristletooth	LC				Indo-Pacific
Animalia	Acanthuridae	*Ctenochaetus cyanocheilus*	Short-tailed bristletooth	LC				Indo-Pacific
Animalia	Acanthuridae	*Ctenochaetus hawaiiensis*	Hawaiian bristletooth	LC				Indo-Pacific
Animalia	Acanthuridae	*Ctenochaetus striatus*	Striped bristletooth	LC				Global
Animalia	Acanthuridae	*Naso annulatus*	Whitemargin unicornfish	LC				Global
Animalia	Acanthuridae	*Naso brevirostris*	Palefin unicornfish	LC				Global
Animalia	Acanthuridae	*Naso caesius*	Gray unicornfish	LC				Indo-Pacific
Animalia	Acanthuridae	*Naso hexacanthus*	Sleek unicornfish	LC				Global
Animalia	Acanthuridae	*Naso lituratus*	Orange spine surgeonfish	LC				Indo-Pacific
Animalia	Acanthuridae	*Naso thynnoides*	Singlespine unicornfish	LC				Indo-Pacific
Animalia	Acanthuridae	*Naso tonganus*	Bulbnose unicornfish	LC				Indo-Pacific
Animalia	Acanthuridae	*Naso unicornis*	Bluespine unicornfish	LC				Global
Animalia	Acanthuridae	*Naso vlamingii*	Bignose unicornfish	LC				Global
Animalia	Acanthuridae	*Paracanthurus hepatus*	Palette surgeonfish	LC				Indo-Pacific

Animalia	Acanthuridae	*Zebrasoma scopas*	Brushtail tang	LC				Indo-Pacific
Animalia	Acanthuridae	*Zebrasoma veliferum*	Sailfin tang	LC				Indo-Pacific
Animalia	Apogonidae	*Apogon indicus*	Indian cardinalfish	LC				Indo-Pacific
Animalia	Apogonidae	*Apogonichthys ocellatus*	Ocellated cardinalfish	LC				Indo-Pacific
Animalia	Apogonidae	*Fibramia lateralis*	Humpback cardinal	LC				Indo-Pacific
Animalia	Apogonidae	*Nectamia fusca*	Ghost cardinalfish	LC				Global
Animalia	Apogonidae	*Ostorhinchus lateralis*	Humpback cardinal	LC				Indo-Pacific
Animalia	Blenniidae	*Alticus arnoldorum*	Pacific leaping blenny	LC				Global
Animalia	Blenniidae	*Aspidontus dussumieri*	Fangblenny	LC				Global
Animalia	Blenniidae	*Aspidontus taeniatus*	Cleaner mimic	LC				Indo-Pacific
Animalia	Blenniidae	*Atrosalarias holomelas*	Brown coral blenny	LC				Indo-Pacific
Animalia	Blenniidae	*Blenniella caudolineata*	Pacific blue-spotted blenny	LC				Indo-Pacific
Animalia	Blenniidae	*Blenniella chrysospilos*	Orange-spotted blenny	LC				Indo-Pacific
Animalia	Blenniidae	*Blenniella gibbifrons*	Picture rockskipper	LC				Indo-Pacific
Animalia	Blenniidae	*Blenniella paula*	Blue-dashed rockskipper	LC				Pacific
Animalia	Blenniidae	*Cirripectes auritus*	Blackflap blenny	LC				Uncertain (AS)
Animalia	Blenniidae	*Cirripectes castaneus*	Chestnut blenny	LC				Global
Animalia	Blenniidae	*Cirripectes fuscoguttatus*	Dusky spotted blenny	LC				Pacific
Animalia	Blenniidae	*Cirripectes jenningsi*	Combtooth blenny	LC				Pacific
Animalia	Blenniidae	*Cirripectes polyzona*	Barred blenny	LC				Indo-Pacific
Animalia	Blenniidae	*Cirripectes quagga*	Zebra blenny	LC				Indo-Pacific
Animalia	Blenniidae	*Cirripectes stigmaticus*	Red-streaked blenny	LC				Indo-Pacific
Animalia	Blenniidae	*Cirripectes variolosus*	Banded fringe blenny	LC				Pacific
Animalia	Blenniidae	*Cirrisalarias bunares*	Hairy blenny	LC				Indo-Pacific
Animalia	Blenniidae	*Ecsenius bicolor*	Bicolor blenny	LC				Indo-Pacific
Animalia	Blenniidae	*Ecsenius midas*	Midas blenny	LC				Global
Animalia	Blenniidae	*Ecsenius opsifrontalis*	Comical blenny	LC				Pacific
Animalia	Blenniidae	*Ecsenius portenoyi*	Blenny	LC				Pacific
Animalia	Blenniidae	*Enchelyurus ater*	Black blenny	LC				Pacific
Animalia	Blenniidae	*Entomacrodus caudofasciatus*	Blacktail blenny	LC				Indo-Pacific

Animalia	Blenniidae	*Entomacrodus cymatobiotus*	Pacific rockskipper	LC				Pacific
Animalia	Blenniidae	*Entomacrodus decussatus*	Wavyline rockskipper	LC				Indo-Pacific
Animalia	Blenniidae	*Entomacrodus epalzeocheilos*	Fringelip rockskipper	LC				Indo-Pacific
Animalia	Blenniidae	*Entomacrodus sealei*	Seale's blenny	LC				Pacific
Animalia	Blenniidae	*Entomacrodus striatus*	Blackspotted rockskipper	LC				Indo-Pacific
Animalia	Blenniidae	*Entomacrodus thalassinus*	Reef margin blenny	LC				Indo-Pacific
Animalia	Blenniidae	*Exallias brevis*	Leopard blenny	LC				Global
Animalia	Blenniidae	*Glyptoparus delicatulus*	Delicate blenny	LC				Indo-Pacific
Animalia	Blenniidae	*Istiblennius bellus*	Imspringer	LC				Indo-Pacific
Animalia	Blenniidae	*Istiblennius lineatus*	Blacklined blenny	LC				Indo-Pacific
Animalia	Blenniidae	*Meiacanthus atrodorsalis*	Eye-lash harptail blenny	LC				Indo-Pacific
Animalia	Blenniidae	*Meiacanthus ditrema*	One-striped poison-fang blenny	LC				Indo-Pacific
Animalia	Blenniidae	*Nannosalarias nativitatis*	Christmas blenny	LC				Indo-Pacific
Animalia	Blenniidae	*Omobranchus obliquus*	Mangrove blenny	LC				Indo-Pacific
Animalia	Blenniidae	*Parenchelyurus hepburni*	Hepburn's blenny	LC				Indo-Pacific
Animalia	Blenniidae	*Petroscirtes mitratus*	Highfinned blenny	LC				Global
Animalia	Blenniidae	*Petroscirtes xestus*	Bearded sabretooth blenny	LC				Indo-Pacific
Animalia	Blenniidae	*Plagiotremus laudandus*	Bicolor fangblenny	LC				Indo-Pacific
Animalia	Blenniidae	*Plagiotremus rhinorhynchos*	Bluestriped fangblenny	LC				Global
Animalia	Blenniidae	*Plagiotremus tapeinosoma*	Piano fangblenny	LC				Global
Animalia	Blenniidae	*Praealticus caesius*	Blackmargin rockskipper	LC				Pacific
Animalia	Blenniidae	*Praealticus margaritatus*	Pearly rockskipper	LC				Resstricted (American Samoa; Fiji; Samoa; Wallis and Futuna)
Animalia	Blenniidae	*Rhabdoblennius snowi*	Snow blenny	LC				Pacific
Animalia	Blenniidae	*Salarias alboguttatus*	White-spotted blenny	LC				Indo-Pacific
Animalia	Blenniidae	*Salarias fasciatus*	Banded jewel-blenny	LC				Global
Animalia	Blenniidae	*Salarias guttatus*	Blue-spot blenny	LC				Indo-Pacific
Animalia	Blenniidae	*Stanulus seychellensis*	Seychelles blenny	LC				Indo-Pacific
Animalia	Caesionidae	*Caesio caerulaurea*	Blue and gold fusilier	LC				Global
Animalia	Caesionidae	*Caesio teres*	Yellowback fusilier	LC				Indo-Pacific
Animalia	Caesionidae	*Pterocaesio marri*	Marr's fusilier	LC				Indo-Pacific

Animalia	Caesionidae	*Pterocaesio tile*	Dark-banded fusilier	LC				Indo-Pacific
Animalia	Caproidae	*Antigonia capros*	Deepbody boarfish	LC				Global
Animalia	Carangidae	*Alectis ciliaris*	African pompano	LC				Global
Animalia	Carangidae	*Atule mate*	Yellowtail scad	LC				Global
Animalia	Carangidae	*Carangoides coeruleopinnatus*	Coastal trevally	LC				Global
Animalia	Carangidae	*Carangoides dinema*	Shadow trevally	LC				Indo-Pacific
Animalia	Carangidae	*Carangoides ferdau*	Blue trevally	LC				Indo-Pacific
Animalia	Carangidae	*Carangoides hedlandensis*	Bumpnose trevally	LC				Indo-Pacific
Animalia	Carangidae	*Carangoides orthogrammus*	Island trevally	LC				Indo-Pacific
Animalia	Carangidae	*Carangoides plagiotaenia*	Barcheek trevally	LC				Global
Animalia	Carangidae	*Caranx ignobilis*	Giant trevally	LC				Global
Animalia	Carangidae	*Caranx lugubris*	Black jack	LC				Global
Animalia	Carangidae	*Caranx melampygus*	Bluefin trevally	LC				Global
Animalia	Carangidae	*Caranx papuensis*	Brassy trevally	LC				Indo-Pacific
Animalia	Carangidae	*Caranx sexfasciatus*	Bigeye trevally	LC				Global
Animalia	Carangidae	*Decapterus macarellus*	Mackerel scad	LC				Global
Animalia	Carangidae	*Decapterus macrosoma*	Shortfin scad	LC				Global
Animalia	Carangidae	*Gnathanodon speciosus*	Golden trevally	LC				Global
Animalia	Carangidae	*Megalaspis cordyla*	Torpedo scad	LC				Global
Animalia	Carangidae	*Naucrates ductor*	Pilotfish	LC				Global
Animalia	Carangidae	*Scomberoides lysan*	Doublespotted queenfish	LC				Global
Animalia	Carangidae	*Selar crumenophthalmus*	Bigeye scad	LC				Global
Animalia	Carangidae	*Trachinotus baillonii*	Small spotted dart	LC				Global
Animalia	Carangidae	*Trachinotus blochii*	Snubnose pompano	LC				Global
Animalia	Carangidae	*Uraspis helvola*	Whitetongue jack	LC				Global
Animalia	Chaetodontidae	*Chaetodon auriga*	Threadfin butterflyfish	LC				Global
Animalia	Chaetodontidae	*Chaetodon bennetti*	Bluelashed butterflyfish	DD				Indo-Pacific
Animalia	Chaetodontidae	*Chaetodon citrinellus*	Speckled butterflyfish	LC				Indo-Pacific
Animalia	Chaetodontidae	*Chaetodon ephippium*	Saddle butterflyfish	LC				Indo-Pacific
Animalia	Chaetodontidae	*Chaetodon flavirostris*	Black butterflyfish	LC				Pacific

Animalia	Chaetodontidae	*Chaetodon kleinii*	Sunburst butteflyfish	LC				Indo-Pacific
Animalia	Chaetodontidae	*Chaetodon lineolatus*	Lined butterflyfish	LC				Global
Animalia	Chaetodontidae	*Chaetodon lunula*	Raccoon butterflyfish	LC				Indo-Pacific
Animalia	Chaetodontidae	*Chaetodon lunulatus*	Oval butterflyfish	LC				Indo-Pacific
Animalia	Chaetodontidae	*Chaetodon melannotus*	Blackback butterflyfish	LC				Indo-Pacific
Animalia	Chaetodontidae	*Chaetodon mertensii*	Atoll butterflyfish	LC				Indo-Pacific
Animalia	Chaetodontidae	*Chaetodon ornatissimus*	Ornate butterflyfish	LC				Indo-Pacific
Animalia	Chaetodontidae	*Chaetodon pelewensis*	Sunset butterflyfish	LC				Indo-Pacific
Animalia	Chaetodontidae	*Chaetodon quadrimaculatus*	Fourspot butterflyfish	LC				Pacific
Animalia	Chaetodontidae	*Chaetodon rafflesii*	Latticed butterflyfish	LC				Indo-Pacific
Animalia	Chaetodontidae	*Chaetodon reticulatus*	Mailed butterflyfish	DD				Indo-Pacific
Animalia	Chaetodontidae	*Chaetodon semeion*	Dotted butterflyfish	LC				Indo-Pacific
Animalia	Chaetodontidae	*Chaetodon trifascialis*	Chevron butterflyfish	NT				Global
Animalia	Chaetodontidae	*Chaetodon ulietensis*	Pacific double-saddle butterflyfish	LC				Indo-Pacific
Animalia	Chaetodontidae	*Chaetodon unimaculatus*	Teardrop butterflyfish	LC				Indo-Pacific
Animalia	Chaetodontidae	*Chaetodon vagabundus*	Vagabond butterflyfish	LC				Indo-Pacific
Animalia	Chaetodontidae	*Forcipiger flavissimus*	Longnose butterflyfish	LC				Global
Animalia	Chaetodontidae	*Forcipiger longirostris*	Longnose butterflyfish	LC				Indo-Pacific
Animalia	Chaetodontidae	*Hemitaurichthys polylepis*	Pyramid butterflyfish	LC				Indo-Pacific
Animalia	Chaetodontidae	*Hemitaurichthys thompsoni*	Thompson's butterflyfish	LC				Pacific
Animalia	Chaetodontidae	*Heniochus acuminatus*	Pennent butterflyfish	LC				Global
Animalia	Chaetodontidae	*Heniochus chrysostomus*	Threeband pennantfish	LC				Indo-Pacific
Animalia	Chaetodontidae	*Heniochus monoceros*	Masked bannerfish	LC				Indo-Pacific
Animalia	Chaetodontidae	*Heniochus singularius*	Singular bannerfish	LC				Indo-Pacific
Animalia	Chaetodontidae	*Heniochus varius*	Horned bannerfish	LC				Indo-Pacific
Animalia	Chiasmodontidae	*Chiasmodon niger*	Black swallower	LC				Global
Animalia	Chiasmodontidae	*Chiasmodon subniger*	Snaketooth	LC				Global
Animalia	Chiasmodontidae	*Dysalotus alcocki*	Snaketooth	LC				Global
Animalia	Chiasmodontidae	*Kali colubrina*	Fragile cagemouth	LC				Global
Animalia	Chiasmodontidae	*Kali indica*	Snaketooth	LC				Global

Animalia	Chiasmodontidae	*Kali kerberti*	Snaketooth	LC				Global
Animalia	Chiasmodontidae	*Pseudoscopelus altipinnis*	Snaketooth	LC				Global
Animalia	Chiasmodontidae	*Pseudoscopelus obtusifrons*	Snaketooth	LC				Global
Animalia	Chiasmodontidae	*Pseudoscopelus scriptus*	Snaketooth	LC				Global
Animalia	Chiasmodontidae	*Pseudoscopelus scutatus*	Snaketooth	LC				Global
Animalia	Cirrhitidae	*Amblycirrhitus bimacula*	Twospot hawkfish	LC				Indo-Pacific
Animalia	Cirrhitidae	*Amblycirrhitus unimacula*	Onespot hawkfish	LC				Indo-Pacific
Animalia	Cirrhitidae	*Cirrhitichthys falco*	Dwarf hawkfish	LC				Indo-Pacific
Animalia	Cirrhitidae	*Cirrhitichthys oxycephalus*	Coral hawkfish	LC				Global
Animalia	Cirrhitidae	*Cirrhitops hubbardi*	Hawkfish	LC				Pacific
Animalia	Cirrhitidae	*Cirrhitus pinnulatus*	Stocky hawkfish	LC				Indo-Pacific
Animalia	Cirrhitidae	*Neocirrhites armatus*	Flame hawkfish	LC				Pacific
Animalia	Cirrhitidae	*Oxycirrhites typus*	Longnose hawkfish	LC				Global
Animalia	Cirrhitidae	*Paracirrhites arcatus*	Arc-eye hawkfish	LC				Indo-Pacific
Animalia	Cirrhitidae	*Paracirrhites forsteri*	Blackside hawkfish	LC				Global
Animalia	Cirrhitidae	*Paracirrhites hemistictus*	Whitespot hawkfish	LC				Indo-Pacific
Animalia	Coryphaenidae	*Coryphaena equiselis*	Pompano dolphinfish	LC				Global
Animalia	Coryphaenidae	*Coryphaena hippurus*	Common dolphinfish	LC				Global
Animalia	Creediidae	*Chalixodytes tauensis*	Saddled sandburrower	LC				Indo-Pacific
Animalia	Creediidae	*Limnichthys nitidus*	Sand submarine	LC				Global
Animalia	Creeidae	*Crystallodytes enderburyensis*	Sandburrower	LC				Pacific
Animalia	Echeneidae	*Echeneis neucratoides*	Whitefin sharksucker	DD				Indo-Pacific
Animalia	Echeneidae	*Phtheirichthys lineatus*	Slender suckerfish	LC				Global
Animalia	Echeneidae	*Remora australis*	Whalesucker	LC				Global
Animalia	Echeneidae	*Remora osteochir*	Marlin sucker	LC				Global
Animalia	Echeneidae	*Remora remora*	Common remora	LC				Global
Animalia	Eleotridae	*Bostrychus sinensis*	Four-eyed sleeper	LC				Indo-Pacific
Animalia	Eleotridae	*Eleotris fusca*	Brown spinecheek gudgeon	LC				Uncertain (AS)
Animalia	Eleotridae	*Eleotris melanosoma*	Broadhead sleeper	LC				Indo-Pacific
Animalia	Eleotridae	*Ophiocara porocephala*	Spangled gudgeon	LC				Indo-Pacific

Animalia	Ephippidae	*Platax orbicularis*	Orbiculate batfish	LC				Global
Animalia	Epinephelidae	*Anyperodon leucogrammicus*	Slender grouper	LC				Global
Animalia	Epinephelidae	*Aporops bilinearis*	Blotched podge	LC				Indo-Pacific
Animalia	Epinephelidae	*Belonoperca chabanaudi*	Arrowhead soapfish	LC				Indo-Pacific
Animalia	Epinephelidae	*Cephalopholis argus*	Peacock grouper	LC				Global
Animalia	Epinephelidae	*Cephalopholis aurantia*	Golden hind	LC				Indo-Pacific
Animalia	Epinephelidae	*Cephalopholis igarashiensis*	Garish hind	LC				Pacific
Animalia	Epinephelidae	*Cephalopholis leopardus*	Leopard hind	LC				Indo-Pacific
Animalia	Epinephelidae	*Cephalopholis miniata*	Coral hind	LC				Global
Animalia	Epinephelidae	*Cephalopholis sexmaculata*	Sixblotch hind	LC				Global
Animalia	Epinephelidae	*Cephalopholis sonnerati*	Tomato hind	LC				Indo-Pacific
Animalia	Epinephelidae	*Cephalopholis spiloparaea*	Strawberry hind	LC				Indo-Pacific
Animalia	Epinephelidae	*Cephalopholis urodeta*	Darkfin hind	LC				Indo-Pacific
Animalia	Epinephelidae	*Epinephelus chlorostigma*	Brownspotted grouper	LC				Indo-Pacific
Animalia	Epinephelidae	*Epinephelus fasciatus*	Blacktip grouper	LC				Global
Animalia	Epinephelidae	*Epinephelus fuscoguttatus*	Brown-marbled grouper	VU				Global
Animalia	Epinephelidae	*Epinephelus hexagonatus*	Starspotted grouper	LC				Indo-Pacific
Animalia	Epinephelidae	*Epinephelus howlandi*	Blacksaddle grouper	LC				Pacific
Animalia	Epinephelidae	*Epinephelus lanceolatus*	Giant grouper	DD				Indo-Pacific
Animalia	Epinephelidae	*Epinephelus macrospilos*	Snubnose grouper	LC				Indo-Pacific
Animalia	Epinephelidae	*Epinephelus maculatus*	Highfin grouper	LC				Indo-Pacific
Animalia	Epinephelidae	*Epinephelus melanostigma*	One-blotch grouper	LC				Indo-Pacific
Animalia	Epinephelidae	*Epinephelus merra*	Honeycomb grouper	LC				Indo-Pacific
Animalia	Epinephelidae	*Epinephelus miliaris*	Netfin grouper	LC				Indo-Pacific
Animalia	Epinephelidae	*Epinephelus morrhua*	Comet grouper	LC				Global
Animalia	Epinephelidae	*Epinephelus polyphekadion*	Camouflage grouper	VU				Global
Animalia	Epinephelidae	*Epinephelus retouti*	Red-tipped grouper	LC				Indo-Pacific
Animalia	Epinephelidae	*Epinephelus socialis*	Surge grouper	LC				Pacific
Animalia	Epinephelidae	*Epinephelus spilotoceps*	Four-saddle grouper	LC				Indo-Pacific
Animalia	Epinephelidae	*Epinephelus tauvina*	Greasy grouper	DD				Global

Animalia	Epinephelidae	*Epinephelus timorensis*	Yellowspotted grouper	LC				Pacific
Animalia	Epinephelidae	*Gracila albomarginata*	Masked grouper	LC				Indo-Pacific
Animalia	Epinephelidae	*Plectropomus areolatus*	Squaretail coralgrouper	VU				Global
Animalia	Epinephelidae	*Plectropomus laevis*	Bluespot coral trout	LC				Indo-Pacific
Animalia	Epinephelidae	*Saloptia powelli*	Golden grouper	LC				Pacific
Animalia	Epinephelidae	*Variola albimarginata*	White-edged lyretail	LC				Indo-Pacific
Animalia	Epinephelidae	*Variola louti*	Yellow-edge lyretail	LC				Indo-Pacific
Animalia	Gempylidae	*Diplospinus multistriatus*	Striped escolar	LC				Global
Animalia	Gempylidae	*Gempylus serpens*	Snake mackerel	LC				Global
Animalia	Gempylidae	*Lepidocybium flavobrunneum*	Escolar	LC				Global
Animalia	Gempylidae	*Nealotus tripes*	Black snake mackerel	LC				Global
Animalia	Gempylidae	*Promethichthys prometheus*	Roudi escolar	LC				Global
Animalia	Gerreidae	*Gerres oblongus*	Slender silver-biddy	LC				Global
Animalia	Gerreidae	*Gerres oyena*	Common silverbiddy	LC				Global
Animalia	Gobiidae	*Amblyeleotris periophthalma*	Periophthalma shrimpgoby	LC				Global
Animalia	Gobiidae	*Amblyeleotris steinitzi*	Steinitz's shrimpgoby	LC				Global
Animalia	Gobiidae	*Amblygobius nocturnus*	Nocturn goby	LC				Global
Animalia	Gobiidae	*Asterropteryx semipunctata*	Starry goby	LC				Global
Animalia	Gobiidae	*Bathygobius coalitus*	Whitespotted frillgoby	LC				Indo-Pacific
Animalia	Gobiidae	*Bathygobius cocosensis*	Cocos frillgoby	LC				Indo-Pacific
Animalia	Gobiidae	*Bathygobius cotticeps*	Cheekscaled frillgoby	LC				Indo-Pacific
Animalia	Gobiidae	*Bathygobius cyclopterus*	Spotted frillgoby	LC				Indo-Pacific
Animalia	Gobiidae	*Bryaninops erythrops*	Erythrops goby	LC				Indo-Pacific
Animalia	Gobiidae	*Bryaninops loki*	Loki whip-goby	LC				Indo-Pacific
Animalia	Gobiidae	*Cabillus tongarevae*	Tongareva goby	LC				Indo-Pacific
Animalia	Gobiidae	*Callogobius flavobrunneus*	Slimy goby	LC				Global
Animalia	Gobiidae	*Callogobius maculipinnis*	Ostrich goby	LC				Global
Animalia	Gobiidae	*Callogobius sclateri*	Pacific goby	LC				Global
Animalia	Gobiidae	*Cryptocentrus strigilliceps*	Target shrimpgoby	LC				Indo-Pacific
Animalia	Gobiidae	*Ctenogobiops aurocingulus*	Gold-streaked shrimpgoby	LC				Indo-Pacific

Animalia	Gobiidae	*Eviota afelei*	Afele's fringefin goby	LC				Indo-Pacific
Animalia	Gobiidae	*Eviota disrupta*	Brokenbar pygmygoby	LC				Pacific
Animalia	Gobiidae	*Eviota distigma*	Twospot pygmygoby	LC				Global
Animalia	Gobiidae	*Eviota herrei*	Herre's eviota	DD				Samoan Archipelago
Animalia	Gobiidae	*Eviota prasites*	Hairfin eviota	LC				Indo-Pacific
Animalia	Gobiidae	*Eviota sebreei*	Sebree's dwarfgoby	LC				Global
Animalia	Gobiidae	*Eviota smaragdus*	Earspot pygmygoby	LC				Indo-Pacific
Animalia	Gobiidae	*Eviota sparsa*	Speckled dwarfgoby	LC				Indo-Pacific
Animalia	Gobiidae	*Eviota zebrina*	Zebra dwarfgoby	LC				Global
Animalia	Gobiidae	*Eviota zonura*	Zoned pygmygoby	LC				Indo-Pacific
Animalia	Gobiidae	*Exyrias belissimus*	Musd reef-goby	LC				Indo-Pacific
Animalia	Gobiidae	*Feia nympha*	Nymph goby	LC				Indo-Pacific
Animalia	Gobiidae	*Fusigobius duospilus*	Barenape goby	LC				Indo-Pacific
Animalia	Gobiidae	*Fusigobius neophytus*	Common fusegoby	LC				Indo-Pacific
Animalia	Gobiidae	*Gnatholepis anjerensis*	Eye-bar goby	LC				Global
Animalia	Gobiidae	*Gobiodon citrinus*	Poison goby	LC				Global
Animalia	Gobiidae	*Gobiopsis exigua*	Goby	LC				Uncertain (AS)
Animalia	Gobiidae	*Istigobius decoratus*	Decorated sand-goby	LC				Global
Animalia	Gobiidae	*Macrodontogobius wilburi*	Largetooth goby	LC				Indo-Pacific
Animalia	Gobiidae	*Mahidolia mystacina*	Flagfin shrimpgoby	LC				Indo-Pacific
Animalia	Gobiidae	*Mugilogobius notospilus*	Pacific mangrove goby	LC				Pacific
Animalia	Gobiidae	*Oligolepis stomias*	Plain teardrop goby	DD				Pacific
Animalia	Gobiidae	*Oplopomus oplopomus*	Spinecheek goby	LC				Global
Animalia	Gobiidae	*Palutrus pruinosa*	Pruinosa goby	LC				Indo-Pacific
Animalia	Gobiidae	*Paragobiodon echinocephalus*	Redhead goby	LC				Global
Animalia	Gobiidae	*Paragobiodon lacunicolus*	Blackfin coral goby	LC				Indo-Pacific
Animalia	Gobiidae	*Paragobiodon melanosomus*	Dark coral goby	LC				Indo-Pacific
Animalia	Gobiidae	*Paragobiodon xanthosomus*	Emerald coral goby	LC				Global
Animalia	Gobiidae	*Periophthalmus argentilineatus*	Barred mudskipper	LC				Indo-Pacific
Animalia	Gobiidae	*Periophthalmus kalolo*	Kalolo mudskipper	LC				Global

Animalia	Gobiidae	*Pleurosicya fringilla*	Staghorn ghostgoby	LC				Indo-Pacific
Animalia	Gobiidae	*Pleurosicya muscarum*	Ghost goby	LC				Indo-Pacific
Animalia	Gobiidae	*Priolepis semidoliata*	Half-barred goby	LC				Global
Animalia	Gobiidae	*Psammogobius biocellatus*	Sleepy goby	LC				Indo-Pacific
Animalia	Gobiidae	*Redigobius bikolanus*	Speckled goby	LC				Indo-Pacific
Animalia	Gobiidae	*Sicyopterus pugnans*	Goby	LC				Restricted (French Polynesia; Samoa)
Animalia	Gobiidae	*Stiphodon hydroreibatus*	Goby	DD				Restricted (American Samoa; Samoa; Wallis and Futuna)
Animalia	Gobiidae	*Trimma benjamini*	Ring-eye pygmy goby	LC				Indo-Pacific
Animalia	Gobiidae	*Trimma emeryi*	Emery's goby	LC				Indo-Pacific
Animalia	Gobiidae	*Trimma flavatrum*	Wasp pygmy goby	LC				Indo-Pacific
Animalia	Gobiidae	*Trimma maiandros*	Meander dwarfgoby	LC				Indo-Pacific
Animalia	Gobiidae	*Trimma okinawae*	Okinawa rubble goby	LC				Indo-Pacific
Animalia	Gobiidae	*Trimma tevegae*	Blue-striped cave goby	LC				Global
Animalia	Gobiidae	*Valenciennea parva*	Parva goby	LC				Indo-Pacific
Animalia	Gobiidae	*Valenciennea puellaris*	Maiden goby	LC				Indo-Pacific
Animalia	Gobiidae	*Valenciennea sexguttata*	Sixspot goby	LC				Indo-Pacific
Animalia	Gobiidae	*Valenciennea strigata*	Blueband goby	LC				Indo-Pacific
Animalia	Gobiidae	*Vanderhorstia ambanoro*	Ambanoro shrimpgoby	LC				Global
Animalia	Gobiidae	*Vanderhorstia ornatissima*	Ornate shrimpgoby	LC				Global
Animalia	Haemulidae	*Plectorhinchus gibbosus*	Brown sweetlips	LC				Indo-Pacific
Animalia	Haemulidae	*Plectorhinchus vittatus*	Indian Ocean oriental sweetlips	LC				Indo-Pacific
Animalia	Howellidae	*Howella simplex*	Cosmopolitan ocean basslet	LC				Global
Animalia	Istiophoridae	*Istiompax indica*	Black marlin	DD				Global
Animalia	Istiophoridae	*Istiophorus platypterus*	Sailfish	LC				Global
Animalia	Istiophoridae	*Kajikia audax*	Striped marlin	NT				Global
Animalia	Istiophoridae	*Makaira nigricans*	Blue marlin	VU				Global
Animalia	Istiophoridae	*Tetrapturus angustirostris*	Shortbill spearfish	DD				Global
Animalia	Kraemeriidae	*Kraemeria samoensis*	Samoan sand dart	LC				Indo-Pacific
Animalia	Kuhliidae	*Kuhlia mugil*	Barred flagtail	LC				Global
Animalia	Kuhliidae	*Kuhlia rupestris*	Jungle perch	LC				Indo-Pacific

Animalia	Kyphosidae	*Kyphosus cinerascens*	Blue sea chub	LC				Global
Animalia	Labridae	*Anampses caeruleopunctatus*	Bluespotted wrasse	LC				Global
Animalia	Labridae	*Anampses melanurus*	Lined wrasse	LC				Indo-Pacific
Animalia	Labridae	*Anampses meleagrides*	Spotted wrasse	LC				Global
Animalia	Labridae	*Anampses twistii*	Yellowbreasted wrasse	LC				Global
Animalia	Labridae	*Bodianus anthioides*	Lyretail hogfish	LC				Global
Animalia	Labridae	*Bodianus axillaris*	Axilspot hogfish	LC				Global
Animalia	Labridae	*Bodianus dictynna*	Redfin hogfish	LC				Indo-Pacific
Animalia	Labridae	*Bodianus loxozonus*	Blackfin hogfish	LC				Indo-Pacific
Animalia	Labridae	*Bolbometopon muricatum*	Bumphead parrotfish	VU				Global
Animalia	Labridae	*Calotomus carolinus*	Carolines parrotfish	LC				Indo-Pacific
Animalia	Labridae	*Calotomus spinidens*	Spinytooth parrotfish	LC				Indo-Pacific
Animalia	Labridae	*Cetoscarus ocellatus*	Bicolor parrotfish	LC				Indo-Pacific
Animalia	Labridae	*Cheilinus chlorourus*	Floral wrasse	LC				Indo-Pacific
Animalia	Labridae	*Cheilinus fasciatus*	Redbreasted wrasse	LC				Indo-Pacific
Animalia	Labridae	*Cheilinus oxycephalus*	Snooty wrasse	LC				Indo-Pacific
Animalia	Labridae	*Cheilinus trilobatus*	Tripletail wrasse	LC				Indo-Pacific
Animalia	Labridae	*Cheilinus undulatus*	Humphead wrasse	EN	II		B	Global
Animalia	Labridae	*Cheilio inermis*	Cigar wrasse	LC				Global
Animalia	Labridae	*Chlorurus bleekeri*	Bleeker's parrotfish	LC				Indo-Pacific
Animalia	Labridae	*Chlorurus frontalis*	Tan-faced parrotfish	LC				Indo-Pacific
Animalia	Labridae	*Chlorurus japanensis*	Palecheek parrotfish	LC				Indo-Pacific
Animalia	Labridae	*Chlorurus microrhinos*	Steephead parrotfish	LC				Indo-Pacific
Animalia	Labridae	*Chlorurus spilurus*	Bullethead parrotfish	LC				Indo-Pacific
Animalia	Labridae	*Choerodon jordani*	Jordan's tuskfish	LC				Indo-Pacific
Animalia	Labridae	*Cirrhilabrus exquisitus*	Exquisite wrasse	DD				Indo-Pacific
Animalia	Labridae	*Cirrhilabrus punctatus*	Dotted wrasse	LC				Pacific
Animalia	Labridae	*Cirrhilabrus roseafascia*	Pink-banded fairy-wrasse	LC				Restricted
Animalia	Labridae	*Cirrhilabrus scottorum*	Scott's wrasse	LC				Pacific
Animalia	Labridae	*Cirrhilabrus walshi*	Walsh's wrasse	LC				Restricted (American Samoa, Samoa, Tonga)

Animalia	Labridae	*Coris aygula*	Clown coris	LC				Global
Animalia	Labridae	*Coris gaimard*	African coris	LC				Indo-Pacific
Animalia	Labridae	*Cymolutes praetextatus*	Knife razorfish	LC				Indo-Pacific
Animalia	Labridae	*Epibulus insidiator*	Slingjaw wrasse	LC				Global
Animalia	Labridae	*Gomphosus varius*	Bird wrasse	LC				Indo-Pacific
Animalia	Labridae	*Halichoeres biocellatus*	Red-lined wrasse	LC				Indo-Pacific
Animalia	Labridae	*Halichoeres claudia*	Claudia's wrasse	LC				Indo-Pacific
Animalia	Labridae	*Halichoeres hartzfeldii*	Hartzfel's wrasse	LC				Indo-Pacific
Animalia	Labridae	*Halichoeres hortulanus*	Checkerboard wrasse	LC				Global
Animalia	Labridae	*Halichoeres margaritaceus*	Pink-belly wrasse	LC				Indo-Pacific
Animalia	Labridae	*Halichoeres marginatus*	Dusky wrasse	LC				Global
Animalia	Labridae	*Halichoeres melanurus*	Tail-spot wrasse	LC				Indo-Pacific
Animalia	Labridae	*Halichoeres melasmapomus*	Cheekspot wrasse	LC				Indo-Pacific
Animalia	Labridae	*Halichoeres prosopeion*	Twotone wrasse	LC				Indo-Pacific
Animalia	Labridae	*Halichoeres trimaculatus*	Threespot wrasse	LC				Indo-Pacific
Animalia	Labridae	*Hemigymnus fasciatus*	Barred thicklip	LC				Indo-Pacific
Animalia	Labridae	*Hemigymnus melapterus*	Blackeye thicklip	LC				Global
Animalia	Labridae	*Hipposcarus longiceps*	Pacific longnose parrotfish	LC				Indo-Pacific
Animalia	Labridae	*Hologymnosus annulatus*	Ring wrasse	LC				Uncertain (AS)
Animalia	Labridae	*Hologymnosus doliatus*	Pastel ring wrasse	LC				indo-Pacific
Animalia	Labridae	*Iniistius aneitensis*	Yellowblotch razorfish	LC				Indo-Pacific
Animalia	Labridae	*Iniistius baldwini*	Baldwin's razorfish	LC				Indo-Pacific
Animalia	Labridae	*Iniistius pavo*	Peacock wrasse	LC				Global
Animalia	Labridae	*Labrichthys unilineatus*	Tubelip wrasse	LC				Indo-Pacific
Animalia	Labridae	*Labroides bicolor*	Bicolor cleaner wrasse	LC				Indo-Pacific
Animalia	Labridae	*Labroides dimidiatus*	Bluestreak cleaner wrasse	LC				Global
Animalia	Labridae	*Labroides rubrolabiatus*	Redlip cleaner wrasse	LC				Pacific
Animalia	Labridae	*Labropsis australis*	Southern tubelip	LC				Pacific
Animalia	Labridae	*Labropsis xanthonota*	Yellowback tubelip	LC				Indo-Pacific
Animalia	Labridae	*Macropharyngodon meleagris*	Blackspotted wrasse	LC				Indo-Pacific

Animalia	Labridae	*Macropharyngodon negrosensis*	Yellowspotted wrasse	LC				Indo-Pacific
Animalia	Labridae	*Oxycheilinus arenatus*	Speckled maori wrasse	LC				Global
Animalia	Labridae	*Oxycheilinus digramma*	Cheeklined wrasse	LC				Global
Animalia	Labridae	*Oxycheilinus orientalis*	Oriental maori wrasse	LC				Global
Animalia	Labridae	*Oxycheilinus unifasciatus*	Ringtail maori wrasse	LC				Indo-Pacific
Animalia	Labridae	*Polylepion russelli*	Wrasse	LC				Pacific
Animalia	Labridae	*Pseudocheilinus evanidus*	Striated wrasse	LC				Global
Animalia	Labridae	*Pseudocheilinus hexataenia*	Sixline wrasse	LC				Global
Animalia	Labridae	*Pseudocheilinus octotaenia*	Eight-lined wrasse	LC				Indo-Pacific
Animalia	Labridae	*Pseudocheilinus tetrataenia*	Fourlined wrasse	LC				Pacific
Animalia	Labridae	*Pseudocoris yamashiroi*	Redspot wrasse	LC				Indo-Pacific
Animalia	Labridae	*Pseudodax moluccanus*	Chiseltooth wrasse	LC				Global
Animalia	Labridae	*Pseudojuloides cerasinus*	Smalltail wrasse	DD				Indo-Pacific
Animalia	Labridae	*Pteragogus cryptus*	Cryptic wrasse	LC				Global
Animalia	Labridae	*Scarus altipinnis*	Filament-finned parrotfish	LC				Pacific
Animalia	Labridae	*Scarus dimidiatus*	Yellowbarred parrotfish	LC				Indo-Pacific
Animalia	Labridae	*Scarus festivus*	Festive parrotfish	LC				Indo-Pacific
Animalia	Labridae	*Scarus forsteni*	Forsten's parrotfish	LC				Indo-Pacific
Animalia	Labridae	*Scarus frenatus*	Bridled parrotfish	LC				Global
Animalia	Labridae	*Scarus globiceps*	Globehead parrotfish	LC				Indo-Pacific
Animalia	Labridae	*Scarus niger*	Dusky parrotfish	LC				Global
Animalia	Labridae	*Scarus oviceps*	Blue parrotfish	LC				Indo-Pacific
Animalia	Labridae	*Scarus psittacus*	Common parrotfish	LC				Global
Animalia	Labridae	*Scarus pyrrostethus*	Blue banded parrotfish	LC				Global
Animalia	Labridae	*Scarus rubroviolaceus*	Ember parrotfish	LC				Global
Animalia	Labridae	*Scarus spinus*	Greensnout parrotfish	LC				Indo-Pacific
Animalia	Labridae	*Scarus tricolor*	Tricolour parrotfish	LC				Indo-Pacific
Animalia	Labridae	*Stethojulis bandanensis*	Red shoulder wrasse	LC				Global
Animalia	Labridae	*Stethojulis strigiventer*	Three-ribbon wrasse	LC				Indo-Pacific
Animalia	Labridae	*Stethojulis trilineata*	Three-lined rainbowfish	LC				Indo-Pacific

Animalia	Labridae	*Thalassoma amblycephalum*	Bluntheaded wrasse	LC				Indo-Pacific
Animalia	Labridae	*Thalassoma hardwicke*	Sixbar wrasse	LC				Indo-Pacific
Animalia	Labridae	*Thalassoma lunare*	Moon wrasse	LC				Global
Animalia	Labridae	*Thalassoma lutescens*	Yellow-brown wrasse	LC				Indo-Pacific
Animalia	Labridae	*Thalassoma purpureum*	Surge wrasse	LC				Global
Animalia	Labridae	*Thalassoma quinquevittatum*	Fivestripe wrasse	LC				Indo-Pacific
Animalia	Labridae	*Thalassoma trilobatum*	Christmas wrasse	LC				Indo-Pacific
Animalia	Labridae	*Wetmorella albofasciata*	Whitebanded sharpnose wrasse	LC				Indo-Pacific
Animalia	Labridae	*Wetmorella nigropinnata*	Sharpnose wrasse	LC				Global
Animalia	Labrodae	*Novaculichthys taeniourus*	Rockmover wrasse	LC				Global
Animalia	Leiognathidae	*Leiognathus equulus*	Common ponyfish	LC				Global
Animalia	Lethrinidae	*Gnathodentex aureolineatus*	Striped large-eye bream	LC				Indo-Pacific
Animalia	Lethrinidae	*Gymnocranius grandoculis*	Blue-lined bigeye bream	LC				Global
Animalia	Lethrinidae	*Lethrinus amboinensis*	Ambon emperor	LC				Indo-Pacific
Animalia	Lethrinidae	*Lethrinus atkinsoni*	Pacific yellowtail emperor	LC				Indo-Pacific
Animalia	Lethrinidae	*Lethrinus erythracanthus*	Orange-spotted emperor	LC				Indo-Pacific
Animalia	Lethrinidae	*Lethrinus harak*	Thumbprint emperor	LC				Global
Animalia	Lethrinidae	*Lethrinus nebulosus*	Spangled emperor	LC				Global
Animalia	Lethrinidae	*Lethrinus obsoletus*	Orange-striped emperor	LC				Global
Animalia	Lethrinidae	*Lethrinus olivaceus*	Longnose emperor	LC				Global
Animalia	Lethrinidae	*Lethrinus rubrioperculatus*	Spotcheek emperor	LC				Global
Animalia	Lethrinidae	*Lethrinus xanthochilus*	Yellowlip emperor	LC				Global
Animalia	Lethrinidae	*Monotaxis grandoculis*	Humpnose big-eye bream	LC				Global
Animalia	Lethrinidae	*Wattsia mossambica*	Mozambique large-eye bream	LC				Indo-Pacific
Animalia	Louvaridae	*Luvarus imperialis*	Louvar	LC				Indo-Pacific
Animalia	Lutjanidae	*Aphareus furca*	Small-toothed jobfish	LC				Global
Animalia	Lutjanidae	*Aphareus rutilans*	Rusty jobfish	LC				Global
Animalia	Lutjanidae	*Aprion virescens*	Green jobfish	LC				Global
Animalia	Lutjanidae	*Etelis carbunculus*	Ruby snapper	LC				Global
Animalia	Lutjanidae	*Etelis coruscans*	Deep-water longtail red snapper	LC				Indo-Pacific

Animalia	Lutjanidae	*Etelis radiosus*	Pale snapper	LC				Indo-Pacific
Animalia	Lutjanidae	*Lipocheilus carnolabrum*	Tang's snapper	LC				Indo-Pacific
Animalia	Lutjanidae	*Lutjanus argentimaculatus*	Mangrove red snapper	LC				Global
Animalia	Lutjanidae	*Lutjanus biguttatus*	Two-spot banded snapper	LC				Indo-Pacific
Animalia	Lutjanidae	*Lutjanus bohar*	Red snapper	LC				Global
Animalia	Lutjanidae	*Lutjanus boutton*	Moluccan snapper	LC				Indo-Pacific
Animalia	Lutjanidae	*Lutjanus fulviflamma*	Dory snapper	LC				Global
Animalia	Lutjanidae	*Lutjanus fulvus*	Blacktail snapper	LC				Global
Animalia	Lutjanidae	*Lutjanus gibbus*	Humpback red snapper	LC				Global
Animalia	Lutjanidae	*Lutjanus kasmira*	Common bluestripe snapper	LC				Global
Animalia	Lutjanidae	*Lutjanus lutjanus*	Bigeye snapper	LC				Global
Animalia	Lutjanidae	*Lutjanus mizenkoi*	Samoan snapper	LC				Indo-Pacific
Animalia	Lutjanidae	*Lutjanus monostigma*	One-spot snapper	LC				Global
Animalia	Lutjanidae	*Lutjanus rivulatus*	Blubberlip snapper	LC				Global
Animalia	Lutjanidae	*Lutjanus rufolineatus*	Yellowlined snapper	LC				Indo-Pacific
Animalia	Lutjanidae	*Lutjanus timoriensis*	Timor snapper	LC				Indo-Pacific
Animalia	Lutjanidae	*Macolor macularis*	Midnight snapper	LC				Indo-Pacific
Animalia	Lutjanidae	*Macolor niger*	Black and white snapper	LC				Indo-Pacific
Animalia	Lutjanidae	*Paracaesio kusakarii*	Saddle-back snapper	LC				Indo-Pacific
Animalia	Lutjanidae	*Paracaesio sordida*	Dirty ordure snapper	LC				Global
Animalia	Lutjanidae	*Paracaesio stonei*	Cocoa snapper	LC				Indo-Pacific
Animalia	Lutjanidae	*Paracaesio xanthura*	Yellowtail blue snapper	LC				Indo-Pacific
Animalia	Lutjanidae	*Pristipomoides argyrogrammicus*	Ornate jobfish	LC				Indo-Pacific
Animalia	Lutjanidae	*Pristipomoides auricilla*	Goldflag jobfish	LC				Indo-Pacific
Animalia	Lutjanidae	*Pristipomoides filamentosus*	Crimson jobfish	LC				Global
Animalia	Lutjanidae	*Pristipomoides flavipinnis*	Golden eye jobfish	LC				Indo-Pacific
Animalia	Lutjanidae	*Pristipomoides multidens*	Goldbanded jobfish	LC				Global
Animalia	Lutjanidae	*Pristipomoides sieboldii*	Lavender jobfish	LC				Global
Animalia	Lutjanidae	*Pristipomoides zonatus*	Oblique-banded snapper	LC				Global
Animalia	Microdesmidae	*Gunnellichthys curiosus*	Curious wormfish	LC				Indo-Pacific

Animalia	Microdesmidae	*Gunnellichthys monostigma*	Onespot wormfish	LC				Global
Animalia	Microdesmidae	*Gunnellichthys pleurotaenia*	Onestripe wormfish	LC				Indo-Pacific
Animalia	Microdesmidae	*Gunnellichthys viridescens*	Yellowstripe wormfish	LC				Indo-Pacific
Animalia	Microdesmidae	*Nemateleotris decora*	Elegant firefish	LC				Indo-Pacific
Animalia	Microdesmidae	*Nemateleotris helfrichi*	Helfrich's dartfish	LC				Pacific
Animalia	Microdesmidae	*Nemateleotris magnifica*	Fire dartfish	LC				Indo-Pacific
Animalia	Microdesmidae	*Ptereleotris evides*	Blackfin dartfish	LC				Global
Animalia	Microdesmidae	*Ptereleotris hanae*	Blue hana goby	LC				Indo-Pacific
Animalia	Microdesmidae	*Ptereleotris heteroptera*	Blacktail goby	LC				Global
Animalia	Microdesmidae	*Ptereleotris monoptera*	Monofin dartfish	LC				Uncertain (AS)
Animalia	Microdesmidae	*Ptereleotris zebra*	Chinese zebra goby	LC				Global
Animalia	Monodactylidae	*Monodactylus argenteus*	Silver moony	LC				Global
Animalia	Mullidae	*Mulloidichthys flavolineatus*	Yellowstripe goatfish	LC				Global
Animalia	Mullidae	*Mulloidichthys vanicolensis*	Yellowfin goatfish	LC				Global
Animalia	Mullidae	*Parupeneus barberinoides*	Bicolor goatfish	LC				Indo-Pacific
Animalia	Mullidae	*Parupeneus barberinus*	Dash-and-dot goatfish	LC				Indo-Pacific
Animalia	Mullidae	*Parupeneus ciliatus*	Whitesaddle goatfish	LC				Indo-Pacific
Animalia	Mullidae	*Parupeneus cyclostomus*	Gold-saddle goatfish	LC				Global
Animalia	Mullidae	*Parupeneus heptacanthus*	Cinnabar goatfish	LC				Global
Animalia	Mullidae	*Parupeneus indicus*	Indian goatfish	LC				Indo-Pacific
Animalia	Mullidae	*Parupeneus insularis*	Twosaddle goatfish	LC				Indo-Pacific
Animalia	Mullidae	*Parupeneus multifasciatus*	Banded goatfish	LC				Indo-Pacific
Animalia	Mullidae	*Parupeneus pleurostigma*	Sidespot goatfish	LC				Indo-Pacific
Animalia	Mullidae	*Upeneus taeniopterus*	Finstripe goatfish	LC				Indo-Pacific
Animalia	Mullidae	*Upeneus vittatus*	Yellowstriped goatfish	LC				Indo-Pacific
Animalia	Nemipteridae	*Pentapodus aureofasciatus*	Yellowstripe threadfin bream	LC				Indo-Pacific
Animalia	Nemipteridae	*Scolopsis trilineata*	Three-lined monocle bream	LC				Indo-Pacific
Animalia	Nomeidae	*Cubiceps capensis*	Cape fathead	LC				Global
Animalia	Nomeidae	*Cubiceps pauciradiatus*	Bigeye cigarfish	LC				Global
Animalia	Nomeidae	*Nomeus gronovii*	Man-of-war fish	LC				Global

Animalia	Nomeidae	*Psenes cyanophrys*	Freckled driftfish	LC				Global
Animalia	Nomeidae	*Psenes pellucidus*	Bluefin driftfish	LC				Global
Animalia	Pomacanthidae	*Centropyge aurantia*	Golden angelfish	LC				Pacific
Animalia	Pomacanthidae	*Centropyge bicolor*	Bicolor angelfish	LC				Indo-Pacific
Animalia	Pomacanthidae	*Centropyge bispinosa*	Twospined angelfish	LC				Indo-Pacific
Animalia	Pomacanthidae	*Centropyge fisheri*	Orange angelfish	LC				Indo-Pacific
Animalia	Pomacanthidae	*Centropyge flavissima*	Lemonpeel angelfish	LC				Indo-Pacific
Animalia	Pomacanthidae	*Centropyge heraldi*	Yellow angelfish	LC				Indo-Pacific
Animalia	Pomacanthidae	*Centropyge loricula*	Flame angel	LC				Indo-Pacific
Animalia	Pomacanthidae	*Centropyge multicolor*	Multicolor angelfish	LC				Pacific
Animalia	Pomacanthidae	*Centropyge nigriocellus*	Blackspot angelfish	LC				Global
Animalia	Pomacanthidae	*Paracentropyge multifasciata*	Barred angelfish	LC				Indo-Pacific
Animalia	Pomacanthidae	*Pomacanthus imperator*	Emperor angelfish	LC				Global
Animalia	Pomacanthidae	*Pygoplites diacanthus*	Royal angelfish	LC				Global
Animalia	Pomacanthiudae	*Apolemichthys trimaculatus*	Threespot angelfish	LC				Indo-Pacific
Animalia	Pomacentridae	*Abudefduf septemfasciatus*	Banded sergeant	LC				Indo-Pacific
Animalia	Pomacentridae	*Abudefduf sexfasciatus*	Scissortail sergeant	LC				Global
Animalia	Pomacentridae	*Abudefduf sordidus*	Blackspot sergeant	LC				Global
Animalia	Pomacentridae	*Abudefduf vaigiensis*	Indo-Pacific sergeant	LC				Global
Animalia	Pomacentridae	*Amblyglyphidodon curacao*	Staghorn damselfish	LC				Indo-Pacific
Animalia	Pomacentridae	*Amphiprion perideraion*	Pink anemonefish	LC				Indo-Pacific
Animalia	Pomacentridae	*Chromis alpha*	Yellow-speckled chromis	LC				Indo-Pacific
Animalia	Pomacentridae	*Chromis amboinensis*	Ambon chromis	LC				Indo-Pacific
Animalia	Priacanthidae	*Heteropriacanthus cruentatus*	Glasseye snapper	LC				Global
Animalia	Priacanthidae	*Priacanthus blochii*	Paeony bulleye	LC				Indo-Pacific
Animalia	Priacanthidae	*Priacanthus hamrur*	Moontail bullseye	LC				Global
Animalia	Priacanthidae	*Priacanthus sagittarius*	Arrow bulleye	LC				Global
Animalia	Priacanthidae	*Pristigenys meyeri*	Bigeye	LC				Indo-Pacific
Animalia	Priacanthidae	*Pristigenys niphonia*	Japanese bigeye	LC				Indo-Pacific
Animalia	Proacanthidae	*Cookeolus japonicus*	Longfinned bullseye	LC				Global

Animalia	Pseudochromidae	*Lubbockichthys multisquamatus*	Manyscaled dottyback	LC				Indo-Pacific
Animalia	Pseudochromidae	*Pictichromis porphyrea*	Magneta dottyback	LC				Indo-Pacific
Animalia	Pseudochromidae	*Pseudochromis jamesi*	Spot-tail dottyback	LC				Pacific
Animalia	Pseudochromidae	*Pseudoplesiops rosae*	Rose island dottyback	LC				Indo-Pacific
Animalia	Pseudochromidae	*Pseudoplesiops wassi*	Fleckfin dottyback	LC				Indo-Pacific
Animalia	Scatophagidae	*Scatophagus argus*	Spotted scad	LC				Indo-Pacific
Animalia	Scombridae	*Auxis rochei*	Bullet tuna	LC				Global
Animalia	Scombridae	*Auxis thazard*	Frigate tuna	LC				Global
Animalia	Scombridae	*Katsuwonus pelamis*	Skipjack tuna	LC				Global
Animalia	Scombridae	*Rastrelliger kanagurta*	Indian mackerel	DD				Global
Animalia	Scombridae	*Thunnus alalunga*	Albacore tuna	NT				Global
Animalia	Scombridae	*Thunnus albacares*	Yellowfin tuna	NT				Global
Animalia	Scombridae	*Thunnus obesus*	Bigeye tuna	VU				Global
Animalia	Serranidae	*Grammistes sexlineatus*	Goldenstriped soapfish	LC				Global
Animalia	Serranidae	*Grammistops ocellatus*	Ocellate soapfish	LC				Indo-Pacific
Animalia	Serranidae	*Liopropoma mitratum*	Pinstriped basslet	LC				Indo-Pacific
Animalia	Serranidae	*Liopropoma susumi*	Meteor perch	LC				Global
Animalia	Serranidae	*Liopropoma tonstrinum*	Redstriped basslet	LC				Indo-Pacific
Animalia	Serranidae	*Plectranthias kamii*	Fairy basslet	LC				Pacific
Animalia	Serranidae	*Plectranthias nanus*	Brownband perchlet	LC				Global
Animalia	Serranidae	*Plectranthias yamakawai*	Fairy basslet	LC				Pacific
Animalia	Serranidae	*Pogonoperca punctata*	Bearded soapfish	LC				Indo-Pacific
Animalia	Serranidae	*Pseudanthias cooperi*	Red-bar anthias	LC				Indo-Pacific
Animalia	Serranidae	*Pseudanthias dispar*	Peach fairy basslet	LC				Indo-Pacific
Animalia	Serranidae	*Pseudanthias hypselosoma*	Stocky anthias	LC				Indo-Pacific
Animalia	Serranidae	*Pseudanthias lori*	Lori's anthias	LC				Indo-Pacific
Animalia	Serranidae	*Pseudanthias olivaceus*	Fairy basslet	LC				Pacific
Animalia	Serranidae	*Pseudanthias pascalus*	Amethyst anthias	LC				Indo-Pacific
Animalia	Serranidae	*Pseudogramma astigma*	Spotless podge	LC				Indo-Pacific
Animalia	Serranidae	*Pseudogramma polyacantha*	Honeycomb podge	LC				Indo-Pacific

Animalia	Serranidae	*Suttonia lineata*	Freckleface podge	LC				Uncertain (AS)
Animalia	Shyraenidae	*Sphyraena barracuda*	Great barracuda	LC				Global
Animalia	Siganidae	*Siganus argenteus*	Forktail rabbitfish	LC				Global
Animalia	Siganidae	*Siganus fuscescens*	Mottled spinefoot	LC				Indo-Pacific
Animalia	Siganidae	*Siganus punctatus*	Goldspotted rabbitfish	LC				Indo-Pacific
Animalia	Siganidae	*Siganus spinus*	Scribbled rabbitfish	LC				Indo-Pacific
Animalia	Tripterygiidae	*Ceratobregma helenae*	Striped spiny-eye triplefin	LC				Uncertain (AS)
Animalia	Tripterygiidae	*Enneapterygius elegans*	Hourglass triplefin	LC				Indo-Pacific
Animalia	Tripterygiidae	*Enneapterygius fuscoventer*	Blackbelly triplefin	LC				Pacific
Animalia	Tripterygiidae	*Enneapterygius hemimelas*	Halfblack triplefin	LC				Indo-Pacific
Animalia	Tripterygiidae	*Enneapterygius minutus*	Minute triplefin	LC				Indo-Pacific
Animalia	Tripterygiidae	*Enneapterygius nigricauda*	Blacktail triplefin	LC				Pacific
Animalia	Tripterygiidae	*Enneapterygius philippinus*	Minute triplefin	LC				Indo-Pacific
Animalia	Tripterygiidae	*Enneapterygius pyramis*	Pyramid triplefin	LC				Pacific
Animalia	Tripterygiidae	*Enneapterygius signicauda*	Flagtail triplefin	LC				Pacific
Animalia	Tripterygiidae	*Enneapterygius triserialis*	White-spotted triplefin	LC				Pacific
Animalia	Tripterygiidae	*Enneapterygius tutuilae*	High hat triplefin	LC				Indo-Pacific
Animalia	Tripterygiidae	*Helcogramma capidata*	Hooded triplefin	LC				Pacific
Animalia	Tripterygiidae	*Helcogramma chica*	Little hooded triplefin	LC				Pacific
Animalia	Tripterygiidae	*Helcogramma hudsoni*	Hudson's triplefin	LC				Indo-Pacific
Animalia	Tripterygiidae	*Helcogramma striata*	Tropical striped triplefin	LC				Uncertain
Animalia	Tripterygiidae	*Norfolkia thomasi*	Thomas' triplefin	LC				Pacific
Animalia	Tripterygiidae	*Springerichthys kulbickii*	Kulbicki's triplefin	LC				Pacific
Animalia	Tripterygiidae	*Ucla xenogrammus*	Largemouth triplefish	LC				Indo-Pacific
Animalia	Xenisthmidae	*Xenisthmus clarus*	Clear wriggler	LC				Indo-Pacific
Animalia	Xenisthmidae	*Xenisthmus eirospilus*	Spotted wriggler	LC				Pacific
Animalia	Xenisthmidae	*Xenisthmus polyzonatus*	Bullseye wriggler	LC				Global
Animalia	Xiphiidae	*Xiphias gladius*	Swordfish	LC				Global
Animalia	Zanclidae	*Zanclus cornutus*	Moorish idol	LC				Global
Animalia	Bothidae	*Bothus mancus*	Flowery flounder	LC				Global

Animalia	Samaridae	*Samariscus triocellatus*	Three-spot righteye flounder	LC				Indo-Pacific
Animalia	Soleidae	*Aseraggodes whitakeri*	Whitaker's sole	LC				Pacific
Animalia	Soleidae	*Brachirus sorsogonensis*	One-eyed sole	DD				Restricted (Philippines, Samoa)
Animalia	Soleidae	*Dexillus muelleri*	Tufted sole	LC				Indo-Pacific
Animalia	Soleidae	*Pardachirus pavoninus*	Peacock sole	LC				Indo-Pacific
Animalia	Soleidae	*Soleichthys heterorhinos*	Black-tip sole	LC				Indo-Pacific
Animalia	Eupharyngidae	*Eurypharynx pelecanoides*	Pelican eel	LC				Global
Animalia	Dactylopteridae	*Dactyloptena orientalis*	Oriental flying gurnard	LC				Global
Animalia	Platycephalidae	*Onigocia bimaculata*	Two-spotted flathead	LC				Global
Animalia	Platycephalidae	*Onigocia oligolepis*	Large-scaled flathead	LC				Indo-Pacific
Animalia	Platycephalidae	*Rogadius welanderi*	Welander's flathead	LC				Indo-Pacific
Animalia	Platycephalidae	*Sunagocia otaitensis*	Fringelip flathead	LC				Indo-Pacific
Animalia	Platycephalidae	*Thysanophrys chiltonae*	Longsnout flathead	LC				Indo-Pacific
Animalia	Scorpaenidae	*Caracanthus maculatus*	Spotted coral croucher	LC				Indo-Pacific
Animalia	Scorpaenidae	*Caracanthus unipinna*	Pygmy coral croucher	LC				Indo-Pacific
Animalia	Scorpaenidae	*Dendrochirus biocellatus*	Twospot turkeyfish	LC				Indo-Pacific
Animalia	Scorpaenidae	*Dendrochirus brachypterus*	Shortfin turkeyfish	LC				Global
Animalia	Scorpaenidae	*Dendrochirus zebra*	Zebra lionfish	LC				Global
Animalia	Scorpaenidae	*Parascorpaena moultoni*	Coral perch	LC				Indo-Pacific
Animalia	Scorpaenidae	*Pontinus macrocephalus*	Large-headed scorpionfish	LC				Indo-Pacific
Animalia	Scorpaenidae	*Pterois antennata*	Broadbarred lionfish	LC				Indo-Pacific
Animalia	Scorpaenidae	*Pterois radiata*	Radial firefish	LC				Indo-Pacific
Animalia	Scorpaenidae	*Pterois volitans*	Red lionfish	LC				Indo-Pacific
Animalia	Scorpaenidae	*Scorpaenodes albaiensis*	Longfingered scorpionfish	LC				Global
Animalia	Scorpaenidae	*Scorpaenodes guamensis*	Guam scorpionfish	LC				Global
Animalia	Scorpaenidae	*Scorpaenodes hirsutus*	Hairy scorpionfish	LC				Global
Animalia	Scorpaenidae	*Scorpaenodes kelloggi*	Dwarf scorpionfish	LC				Indo-Pacific
Animalia	Scorpaenidae	*Scorpaenodes minor*	Minor scorpionfish	LC				Pacific
Animalia	Scorpaenidae	*Scorpaenodes parvipinnis*	Lowfin scorpionfish	LC				Global
Animalia	Scorpaenidae	*Scorpaenopsis diabolus*	False stonefish	LC				Global

Animalia	Scorpaenidae	*Scorpaenopsis macrochir*	Flasher scorpionfish	LC				Indo-Pacific
Animalia	Scorpaenidae	*Scorpaenopsis papuensis*	Papuan scorpionfish	LC				Indo-Pacific
Animalia	Scorpaenidae	*Scorpaenopsis possi*	Poss's scorpionfish	LC				Global
Animalia	Scorpaenidae	*Scorpaenopsis vittapinna*	Bandfin scorpionfish	LC				Global
Animalia	Scorpaenidae	*Sebastapistes cyanostigma*	Yellowspotted scorpionfish	LC				Global
Animalia	Scorpaenidae	*Sebastapistes fowleri*	Pygmy scorpionfish	LC				Global
Animalia	Scorpaenidae	*Sebastapistes mauritiana*	Spineblotch scorpionfish	LC				Global
Animalia	Scorpaenidae	*Sebastapistes strongia*	Barchin scoprionfish	LC				Global
Animalia	Scorpaenidae	*Taenianotus triacanthus*	Leaf scorpionfish	LC				Global
Animalia	Setarchidae	*Setarches guentheri*	Deepwater scorpionfish	LC				Global
Animalia	Synanceiidae	*Synanceia verrucosa*	Stonefish	LC				Global
Animalia	Gibberichthyidae	*Gibberichthys latifrons*	Broadmouth gibberfish	LC				Indo-Pacific
Animalia	Melamphaidae	*Melamphaes danae*	Bigscale	LC				Indo-Pacific
Animalia	Melamphaidae	*Melamphaes indicus*	Indian bigscale	LC				Indo-Pacific
Animalia	Melamphaidae	*Melamphaes longivelis*	Eyebrow bigscale	DD				Global
Animalia	Melamphaidae	*Melamphaes polylepis*	Melánfido	DD				Global
Animalia	Melamphaidae	*Poromitra gibbsi*	Gibbs' bigscale	LC				Pacific
Animalia	Melamphaidae	*Poromitra macrophthalma*	Bigscale	LC				Indo-Pacific
Animalia	Melamphaidae	*Poromitra megalops*	Ridgehead	DD				Global
Animalia	Melamphaidae	*Poromitra oscitans*	Tiny-eye bigscale	LC				Global
Animalia	Melamphaidae	*Scopeloberyx malayanus*	Bigscale	LC				Indo-Pacific
Animalia	Melamphaidae	*Scopeloberyx opisthopterus*	Ridgehead	LC				Uncertain
Animalia	Melamphaidae	*Scopeloberyx robustus*	Longjaw bigscale	DD				Global
Animalia	Melamphaidae	*Scopelogadus mizolepis*	Bigscale	LC				Global
Animalia	Melamphaidae	*Sio nordenskjoldii*	Nordenskjold's bigscale	LC				Global
Animalia	Gonostomatidae	*Cyclothone acclinidens*	Bent-tooth bristlemouth	LC				Global
Animalia	Gonostomatidae	*Cyclothone alba*	Bristlemouth	LC				Global
Animalia	Gonostomatidae	*Cyclothone braueri*	Garrick	LC				Global
Animalia	Gonostomatidae	*Cyclothone microdon*	Veiled angelmouth	LC				Global
Animalia	Gonostomatidae	*Cyclothone obscura*	Hidden bristlemouth	LC				Global

Animalia	Gonostomatidae	*Cyclothone pallida*	Bicolored bristlemouth	LC				Global
Animalia	Gonostomatidae	*Cyclothone pseudopallida*	Slender bristlemouth	LC				Global
Animalia	Gonostomatidae	*Cyclothone signata*	Showy bristletooth	LC				Uncertain (AS)
Animalia	Gonostomatidae	*Diplophos taenia*	Pacific portholefish	LC				Global
Animalia	Gonostomatidae	*Gonostoma atlanticum*	Atlantic fangjaw	LC				Global
Animalia	Gonostomatidae	*Gonostoma elongatum*	Elongated bristlemouth fish	LC				Global
Animalia	Gonostomatidae	*Manducus greyae*	Bristlemouth	LC				Indo-Pacific
Animalia	Gonostomatidae	*Manducus maderensis*	Bristlemouth	DD				Global
Animalia	Gonostomatidae	*Sigmops ebelingi*	Ebeling's fangjaw	LC				Indo-Pacific
Animalia	Gonostomatidae	*Sigmops longipinnis*	Dragonfish	LC				Pacific
Animalia	Phosichthydae	*Ichthyococcus intermedius*	Intermediate lightfish	LC				Pacific
Animalia	Phosichthydae	*Vinciguerria lucetia*	Panama lightfish	LC				Global
Animalia	Phosichthydae	*Vinciguerria nimbaria*	Frilled lighthousefish	LC				Global
Animalia	Phosichthydae	*Woodsia meyerwaardeni*	Austral lightfish	LC				Global
Animalia	Sternoptychidae	*Argyropelecus aculeatus*	Lovely hatchetfish	LC				Global
Animalia	Sternoptychidae	*Argyropelecus gigas*	Giant hatchetfish	LC				Global
Animalia	Sternoptychidae	*Argyropelecus olfersii*	Silver hatchetfish	LC				Global
Animalia	Sternoptychidae	*Argyropelecus sladeni*	Sladen's hatchetfish	LC				Indo-Pacific
Animalia	Sternoptychidae	*Polyipnus meteori*	Hatchetfish	LC				Indo-Pacific
Animalia	Sternoptychidae	*Polyipnus omphus*	Omphus hatchetfish	LC				Indo-Pacific
Animalia	Sternoptychidae	*Sternoptyx diaphana*	Diaphanous hatchetfish	LC				Global
Animalia	Sternoptychidae	*Sternoptyx pseudobscura*	Highlight hatchetfish	LC				Global
Animalia	Sternoptychidae	*Valenciennellus carlsbergi*	Hatchetfish	LC				Indo-Pacific
Animalia	Sternoptychidae	*Valenciennellus tripunctulatus*	Constellation fish	LC				Global
Animalia	Stomiidae	*Aristostomias lunifer*	Barbeled dragonfish	LC				Global
Animalia	Stomiidae	*Astronesthes bilobatus*	Twinlobe snaggletooth	LC				Indo-Pacific
Animalia	Stomiidae	*Astronesthes cyaneus*	Blue snaggletooth	LC				Indo-Pacific
Animalia	Stomiidae	*Astronesthes indicus*	Indian snaggletooth	LC				Global
Animalia	Stomiidae	*Astronesthes luetkeni*	Barbeled dragonfish	LC				Indo-Pacific
Animalia	Stomiidae	*Astronesthes splendidus*	Splendid snaggletooth	LC				Indo-Pacific

Animalia	Stomiidae	*Astronesthes trifibulatus*	Triplethread snaggletooth	LC				Indo-Pacific
Animalia	Stomiidae	*Bathophilus abarbatus*	Barbless dragonfish	LC				Pacific
Animalia	Stomiidae	*Bathophilus irregularis*	Barbeled dragonfish	LC				Pacific
Animalia	Stomiidae	*Chauliodus sloani*	Sloan's viperfish	LC				Global
Animalia	Stomiidae	*Echiostoma barbatum*	Threadfin dragonfish	LC				Global
Animalia	Stomiidae	*Eustomias bifilis*	Twinthread dragonfish	LC				Indo-Pacific
Animalia	Stomiidae	*Eustomias braueri*	Barbeled dragonfish	DD				Global
Animalia	Stomiidae	*Eustomias bulbornatus*	Grapevine dragonfish	LC				Indo-Pacific
Animalia	Stomiidae	*Eustomias cryptobulbus*	Hiddenbulb dragonfish	LC				Global
Animalia	Stomiidae	*Eustomias enbarbatus*	Barbate dragonfish	LC				Global
Animalia	Stomiidae	*Eustomias furcifer*	Barbeled dragonfish	LC				Global
Animalia	Stomiidae	*Eustomias macronema*	Bigbarb dragonfish	LC				Global
Animalia	Stomiidae	*Eustomias macrurus*	Scaleless dragonfish	LC				Global
Animalia	Stomiidae	*Eustomias perplexus*	Barbeled dragonfish	LC				Global
Animalia	Stomiidae	*Eustomias satterleei*	Twinray dragonfish	LC				Global
Animalia	Stomiidae	*Eustomias schmidti*	Schmidt's dragonfish	LC				Global
Animalia	Stomiidae	*Eustomias simplex*	Barbeled dragonfish	LC				Global
Animalia	Stomiidae	*Eustomias vitiazi*	Vitiaz dragonfish	LC				Pacific
Animalia	Stomiidae	*Idiacanthus fasciola*	Ribbon sawtail fish	LC				Global
Animalia	Stomiidae	*Malacosteus australis*	Southern stoplight loosejaw	LC				Indo-Pacific
Animalia	Stomiidae	*Malacosteus niger*	Stoplight loosejaw	LC				Global
Animalia	Stomiidae	*Melanostomias valdiviae*	Valdivia black dragonfish	LC				Global
Animalia	Stomiidae	*Photonectes albipennis*	Whitepen dragonfish	LC				Indo-Pacific
Animalia	Stomiidae	*Photonectes margarita*	Barbeled dragonfish	LC				Global
Animalia	Stomiidae	*Photonectes parvimanus*	Fleshyfin dragonfish	LC				Global
Animalia	Stomiidae	*Photostomias liemi*	Barbeled dragonfish	LC				Indo-Pacific
Animalia	Stomiidae	*Photostomias tantillux*	Barbeled dragonfish	LC				Indo-Pacific
Animalia	Stomiidae	*Stomias affinis*	Guenther's boafish	LC				Global
Animalia	Stomiidae	*Stomias danae*	Barbeled dragonfish	LC				Global
Animalia	Stomiidae	*Stomias nebulosus*	Slcock's boafish	LC				Indo-Pacific

Animalia	Stomiidae	*Thysanactis dentex*	Broomfin dragonfish	LC				Global
Animalia	Aulostomidae	*Aulostomus chinensis*	Chinese trumpetfish	LC				Global
Animalia	Centriscidae	*Macroramphosus scolopax*	Longspine snipefish	LC				Global
Animalia	Syngnagthidae	*Hippichthys spicifer*	Bellybarred pipefish	LC				Indo-Pacific
Animalia	Syngnathidae	*Choeroichthys cinctus*	Barred shortbody pipefish	LC				Indo-Pacific
Animalia	Syngnathidae	*Choeroichthys sculptus*	Sculptured pipefish	LC				Indo-Pacific
Animalia	Syngnathidae	*Corythoichthys amplexus*	Brown-banded pipefish	LC				Indo-Pacific
Animalia	Syngnathidae	*Corythoichthys flavofasciatus*	Network pipefish	LC				Global
Animalia	Syngnathidae	*Corythoichthys intestinalis*	Banded pipefish	LC				Indo-Pacific
Animalia	Syngnathidae	*Corythoichthys schultzi*	Schultz's pipefish	LC				Global
Animalia	Syngnathidae	*Cosmocampus maxweberi*	Maxweber's pipefish	LC				Indo-Pacific
Animalia	Syngnathidae	*Doryrhamphus excisus*	Bluestriped pipefish	LC				Global
Animalia	Syngnathidae	*Dunckerocampus dactyliophorus*	Banded pipefish	DD				Indo-Pacific
Animalia	Syngnathidae	*Festucalex wassi*	Wass's pipefish	DD				Pacific
Animalia	Syngnathidae	*Halicampus mataafae*	Samoan pipefish	LC				Global
Animalia	Syngnathidae	*Halicampus spinirostris*	Spinysnout pipefish	LC				Uncertain (AS)
Animalia	Syngnathidae	*Hippocampus histrix*	Thorny seahorse	VU	II		B	Indo-Pacific
Animalia	Syngnathidae	*Hippocampus kuda*	Spotted seahorse	VU	II		B	Global
Animalia	Syngnathidae	*Micrognathus andersonii*	Anderson's pipefish	LC				Global
Animalia	Syngnathidae	*Microphis argulus*	Flat-nosed pipefish	LC				Indo-Pacific
Animalia	Syngnathidae	*Microphis brachyurus*	Opossum pipefish	LC				Global
Animalia	Syngnathidae	*Phoxocampus diacanthus*	Obscure pipefish	LC				Indo-Pacific
Animalia	Syngnathidae	*Syngnathoides biaculeatus*	Alligator pipefish	LC				Global
Animalia	Balistidae	*Canthidermis maculata*	Rough triggerfish	LC				Global
Animalia	Balistidae	*Melichthys niger*	Black triggerfish	LC				Global
Animalia	Balistidae	*Sufflamen fraenatum*	Masked triggerfish	LC				Indo-Pacific
Animalia	Diodontidae	*Chilomycterus reticulatus*	Spotfin burrfish	LC				Global
Animalia	Diodontidae	*Diodon eydouxii*	Pelagic porcupinefish	LC				Global
Animalia	Diodontidae	*Diodon holocanthus*	Longspine porcupinefish	LC				Global
Animalia	Diodontidae	*Diodon hystrix*	Spot-fin porcupinefish	LC				Global

Animalia	Molidae	*Masturus lanceolatus*	Sharptail mola	LC				Global
Animalia	Molidae	*Mola mola*	Ocean sunfish	VU				Global
Animalia	Molidae	*Ranzania laevis*	Slender sunfish	LC				Global
Animalia	Monacanthidae	*Aluterus monoceros*	Unicorn leatherjacket filefish	LC				Global
Animalia	Monacanthidae	*Aluterus scriptus*	Scribbled leatherjacket filefish	LC				Global
Animalia	Monacanthidae	*Amanses scopas*	Broom filefish	LC				Global
Animalia	Monacanthidae	*Cantherhines dumerilii*	Whitespotted filefish	LC				Global
Animalia	Monacanthidae	*Cantherhines pardalis*	Honeycomb filefish	LC				Global
Animalia	Monacanthidae	*Monacanthus chinensis*	Fan-bellied leatherjacket	LC				Indo-Pacific
Animalia	Monacanthidae	*Oxymonacanthus longirostris*	Harlequin filefish	VU				Indo-Pacific
Animalia	Monacanthidae	*Pervagor melanocephalus*	Redtail filefish	LC				Indo-Pacific
Animalia	Tetraodontidae	*Arothron hispidus*	White-spotted puffer	LC				Global
Animalia	Tetraodontidae	*Arothron manilensis*	Narrow-lined puffer	LC				Indo-Pacific
Animalia	Tetraodontidae	*Arothron mappa*	Map puffer	LC				Indo-Pacific
Animalia	Tetraodontidae	*Arothron meleagris*	Guineafowl puffer	LC				Global
Animalia	Tetraodontidae	*Arothron nigropunctatus*	Blackspotted puffer	LC				Indo-Pacific
Animalia	Tetraodontidae	*Arothron stellatus*	Star puffer	LC				Global
Animalia	Tetraodontidae	*Canthigaster amboinensis*	Spider-eye puffer	LC				Global
Animalia	Tetraodontidae	*Canthigaster bennetti*	Bennett's sharpnose puffer	LC				Global
Animalia	Tetraodontidae	*Canthigaster epilampra*	Lantern toby	LC				Indo-Pacific
Animalia	Tetraodontidae	*Canthigaster janthinoptera*	Honeycomb toby	LC				Indo-Pacific
Animalia	Tetraodontidae	*Canthigaster solandri*	Spotted sharpnose	LC				Indo-Pacific
Animalia	Tetraodontidae	*Canthigaster valentini*	Blacksaddle toby	LC				Indo-Pacific
Animalia	Tetraodontidae	*Lagocephalus lagocephalus*	Oceanic puffer	LC				Global
Animalia	Tetraodontidae	*Lagocephalus sceleratus*	Silver-cheeked toadfish	LC				Global
Animalia	Tetraodontidae	*Sphoeroides pachygaster*	Blunthead puffer	LC				Global
Animalia	Tetraodontidae	*Torquigener hypselogeneion*	Orange-spotted toadfish	LC				Indo-Pacific
Animalia	Grammicolepididae	*Xenolepidichthys dalgleishi*	Spotted tinselfish	LC				Global
Animalia	Anatidae	*Anas superciliosa*	Pacific black duck	LC				Indo-Pacific
Animalia	Charadriidae	*Pluvialis fulva*	Pacific golden plover	LC		II		Global

Animalia	Laridae	*Anous ceruleus*	Blue noddy	LC				Pacific
Animalia	Laridae	*Anous minutus*	Black noddy	LC				Global
Animalia	Laridae	*Anous stolidus*	Brown noddy	LC				Uncertain
Animalia	Laridae	*Gygis alba*	White tern	LC				Indo-Pacific
Animalia	Laridae	*Larus atricilla*	Laughing gull	LC				Global
Animalia	Laridae	*Onychoprion fuscatus*	Sooty tern	LC				Global
Animalia	Laridae	*Onychoprion lunatus*	Grey-backed tern	LC				Restricted (Japan, Samoa, Tuvalu)
Animalia	Laridae	*Sterna sumatrana*	Black-naped tern	LC				Indo-Pacific
Animalia	Laridae	*Sternula albifrons*	Little tern	LC		II		Global
Animalia	Scolopacidae	*Actitis hypoleucos*	Common sandpiper	LC		II		Global
Animalia	Scolopacidae	*Arenaria interpres*	Ruddy ternstone	LC		II		Global
Animalia	Scolopacidae	*Numenius phaeopus*	Whimbrel	LC				Global
Animalia	Scolopacidae	*Numenius tahitiensis*	Bristle-thighed curlew	VU				Pacific
Animalia	Scolopacidae	*Tringa incana*	Wandering tattler	LC				Global
Animalia	Alcedinidae	*Todiramphus chloris*	Collared kingfisher	LC				Uncertain (AS)
Animalia	Alcedinidae	*Todiramphus recurvirostris*	Flat-billed kingfisher	LC				Restricted (Samoa)
Animalia	Rallidae	*Amaurornis cinerea*	White-browed crake	LC				Indo-Pacific
Animalia	Rallidae	*Hypotaenidia philippensis*	Buff-banded rail	LC				Indo-Pacific
Animalia	Rallidae	*Porphyrio porphyrio*	Purple swamphen	LC				Global
Animalia	Rallidae	*Zapornia tabuensis*	Spotless crake	LC				Indo-Pacific
Animalia	Phaethontidae	*Phaethon lepturus*	White-tailed tropicbird	LC				Uncertain (AS)
Animalia	Phaethontidae	*Phaethon rubricauda*	Red-tailed tropicbird	LC				Uncertain
Animalia	Diomedeidae	*Thalassarche eremita*	Chatham albatross	VU				Uncertain (AS)
Animalia	Oceanitidae	*Fregetta grallaria*	White-bellied storm-petrel	LC				Uncertain
Animalia	Oceanitidae	*Fregetta tropica*	Black-bellied storm-petrel	LC				Uncertain
Animalia	Oceanitidae	*Nesofregetta fuliginosa*	Polynesian storm-petrel	EN				Uncertain
Animalia	Oceanitidae	*Oceanites oceanicus*	Wilson's storm-petrel	LC				Uncertain
Animalia	Oceanitidae	*Pelagodroma marina*	White-faced storm-petrel	LC				Uncertain
Animalia	Procellariidae	*Ardenna bulleri*	Buller's shearwater	VU				Uncertain
Animalia	Procellariidae	*Ardenna grisea*	Sooty shearwater	NT				Uncertain (AS)

Animalia	Procellariidae	*Ardenna pacifica*	Wedge-tailed shearwater	LC				Indo-Pacific
Animalia	Procellariidae	*Ardenna tenuirostris*	Short-tailed shearwater	LC				Uncertain
Animalia	Procellariidae	*Pseudobulweria rostrata*	Tahiti petrel	NT				Uncertain
Animalia	Procellariidae	*Pterodroma alba*	Phoenix petrel	EN				Uncertain
Animalia	Procellariidae	*Pterodroma brevipes*	Collared petrel	VU				Uncertain
Animalia	Procellariidae	*Pterodroma cervicalis*	White-necked petrel	VU				Uncertain
Animalia	Procellariidae	*Pterodroma cookii*	Cook's petrel	VU				Uncertain
Animalia	Procellariidae	*Pterodroma heraldica*	Herald petrel	LC				Uncertain
Animalia	Procellariidae	*Pterodroma inexpectata*	Mottled petrel	NT				Uncertain
Animalia	Procellariidae	*Pterodroma leucoptera*	White-winged petrel	VU				Uncertain
Animalia	Procellariidae	*Pterodroma neglecta*	Kermadec petrel	LC				Uncertain
Animalia	Procellariidae	*Pterodroma nigripennis*	Black-winged petrel	LC				Uncertain
Animalia	Procellariidae	*Pterodroma solandri*	Providence petrel	VU				Uncertain
Animalia	Procellariidae	*Puffinus bailloni*	Tropical shearwater	LC				Pacific
Animalia	Fregatidae	*Fregata minor*	Great frigatebird	LC				Uncertain
Animalia	Sulidae	*Sula dactylatra*	Masked booby	LC				Global
Animalia	Sulidae	*Sula leucogaster*	Brown booby	LC				Global
Animalia	Sulidae	*Sula sula*	Red-footed booby	LC				Global
Animalia	Carcharhinidae	*Carcharhinus amblyrhynchos*	Grey reef shark	NT				Indo-Pacific
Animalia	Carcharhinidae	*Carcharhinus falciformis*	Silky shark	VU		II		Global
Animalia	Carcharhinidae	*Carcharhinus limbatus*	Blacktip shark	NT				Global
Animalia	Carcharhinidae	*Carcharhinus longimanus*	Oceanic whitetip shark	CR	II		B	Global
Animalia	Carcharhinidae	*Carcharodon carcharias*	Great white shark	VU				Global
Animalia	Carcharhinidae	*Galeocerdo cuvier*	Tiger shark	NT				Global
Animalia	Carcharhinidae	*Prionace glauca*	Blue shark	NT		II		Global
Animalia	Carcharhinidae	*Triaenodon obesus*	Whitetip reef shark	NT				Global
Animalia	Sphyrnidae	*Sphyrna lewini*	Scalloped hammerhead	CR	II	II	B	Global
Animalia	Alopiidae	*Alopias pelagicus*	Pelagic thresher	EN				Global
Animalia	Alopiidae	*Alopias superciliosus*	Bigeye thresher	VU				Global
Animalia	Alopiidae	*Alopias vulpinus*	Common thresher	VU				Restricted

Animalia	Cetorhinidae	*Cetorhinus maximus*	Basking shark	EN				Global
Animalia	Lamnidae	*Isurus oxyrinchus*	Shortfin mako	EN	II	II	B	Global
Animalia	Pseudocarchariidae	*Pseudocarcharias kamoharai*	Crocodile shark	LC				Global
Animalia	Mobulidae	*Mobula alfredi*	Reef manta ray	VU				Uncertain
Animalia	Mobulidae	*Mobula mobular*	Giant devilray	EN				Uncertain
Animalia	Mobulidae	*Mobula tarapacana*	Sicklefin devilray	EN				Uncertain
Animalia	Mobulidae	*Mobula thurstoni*	Bentfin devilray	EN				Uncertain
Animalia	Ginglymostomatidae	*Nebrius ferrugineus*	Tawny nurse shark	VU				Global
Animalia	Rhincodontidae	*Rhincodon typus*	Whale shark	EN	II	I/II	B	Global
Animalia	Balaenopteridae	*Balaenoptera edeni*	Bryde's whale	LC				Global
Animalia	Balaenopteridae	*Balaenoptera musculus ssp. intermedia*	Blue whale	CR				Global; heard in Samoa
Animalia	Balaenopteridae	*Megaptera novaeangliae*	Humpback whale	EN	I	I	A	Global
Animalia	Delphinidae	*Globicephala macrorhynchus*	Short-finned pilot whale	LC	II		A	Global
Animalia	Delphinidae	*Grampus griseus*	Risso's dolphin	LC				Global
Animalia	Delphinidae	*Lagenodelphis hosei*	Fraser's dolphin	LC				Global
Animalia	Delphinidae	*Orcinus orca*	Killer whale	DD				Global
Animalia	Delphinidae	*Peponocephala electra*	Melon-headed whale	LC				Global
Animalia	Delphinidae	*Pseudorca crassidens*	False killer whale	NT				Global
Animalia	Delphinidae	*Stenella attenuata*	Pantropical spotted dolphin	LC				Uncertain
Animalia	Delphinidae	*Stenella coeruleoalba*	Striped dolphin	LC				Global
Animalia	Delphinidae	*Stenella longirostris*	Spinner dolphin	LC				Global
Animalia	Delphinidae	*Steno bredanensis*	Rough-toothed dolphin	LC				Global
Animalia	Delphinidae	*Tursiops truncatus*	Common bottlenose dolphin	LC	II	II	A	Global
Animalia	Physeteridae	*Kogia breviceps*	Pygmy sperm whale	DD				Global
Animalia	Physeteridae	*Kogia sima*	Dwarf sperm whale	DD				Global
Animalia	Physeteridae	*Physeter macrocephalus*	Sperm whale	VU				Global
Animalia	Ziphiidae	*Mesoplodon densirostris*	Blainville's beaked whale	DD				Uncertain
Animalia	Ziphiidae	*Mesoplodon ginkgodens*	Gingko-toothed beaked whale	DD				Global
Animalia	Ziphiidae	*Ziphius cavirostris*	Cuvier's beaked whale	LC				Global
Animalia	Delphinidae	*Feresa attenuata*	Pygmy killer whale	LC				Global

Animalia	Elapidae	*Hydrophis platurus*	Yellow-bellied sea snake	LC				Global
Animalia	Elapidae	*Laticauda colubrina*	Yellow-lipped sea krait	LC				Indo-Pacific
Animalia	Cheloniidae	*Caretta caretta*	Loggerhead turtle	VU	I		A	Unlikely
Animalia	Cheloniidae	*Chelonia mydas*	Green turtle	EN	I	I/II	A	Global
Animalia	Cheloniidae	*Eretmochelys imbricata*	Hawksbill turtle	CR	I	I/II	A	Global
Animalia	Dermochelyidae	*Dermochelys coriacea*	Leatherback turtle	CR	I	I/II	A	Global
Animalia	Tubiporidae	*Tubipora musica*	Organ pipe coral	NT				Global
Animalia	Acroporidae	*Acropora abrotanoides*	Acropora coral	LC	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora aculeus*	Acropora coral	VU	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora acuminata*	Acropora coral	VU	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora aspera*	Acropora coral	VU	II		B	Global
Animalia	Acroporidae	*Acropora austera*	Acropora coral	NT	II		B	Global
Animalia	Acroporidae	*Acropora carduus*	Acropora coral	NT	II		B	Pacific
Animalia	Acroporidae	*Acropora cerealis*	Acropora coral	LC	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora chesterfieldensis*	Acropora coral	LC	II		B	Western Pacific
Animalia	Acroporidae	*Acropora clathrata*	Acropora coral	LC	II		B	Global
Animalia	Acroporidae	*Acropora cophodactyla*	Acropora coral	DD				Indo-Pacific
Animalia	Acroporidae	*Acropora cytherea*	Acropora coral	LC	II		B	Global
Animalia	Acroporidae	*Acropora dendrum*	Acropora coral	VU	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora digitifera*	Acropora coral	NT	II		B	Global
Animalia	Acroporidae	*Acropora divaricata*	Acropora coral	NT	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora donei*	Acropora coral	VU				Indo-Pacific
Animalia	Acroporidae	*Acropora elseyi*	Acropora coral	LC				Global
Animalia	Acroporidae	*Acropora florida*	Acropora coral	NT	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora formosa*	Acropora coral	NT	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora gemmifera*	Acropora coral	LC	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora glauca*	Acropora coral	NT	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora globiceps*	Acropora coral	VU	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora grandis*	Acropora coral	LC	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora granulosa*	Acropora coral	NT				Global

Animalia	Acroporidae	*Acropora horrida*	Acropora coral	VU				Global
Animalia	Acroporidae	*Acropora humilis*	Acropora coral	NT	II		B	Global
Animalia	Acroporidae	*Acropora hyacinthus*	Acropora coral	NT	II		B	Global
Animalia	Acroporidae	*Acropora inermis*	Acropora coral	DD				Indo-Pacific
Animalia	Acroporidae	*Acropora insignis*	Acropora coral	DD				Indo-Pacific
Animalia	Acroporidae	*Acropora jacquelineae*	Acropora coral	VU				Indo-Pacific
Animalia	Acroporidae	*Acropora latistella*	Acropora coral	LC	II		B	Global
Animalia	Acroporidae	*Acropora listeri*	Acropora coral	VU	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora lokani*	Acropora coral	VU				Indo-Pacific
Animalia	Acroporidae	*Acropora longicyathus*	Acropora coral	LC				Indo-Pacific
Animalia	Acroporidae	*Acropora loripes*	Acropora coral	NT				Global
Animalia	Acroporidae	*Acropora lutkeni*	Acropora coral	NT	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora microclados*	Acropora coral	VU	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora microphthalma*	Acropora coral	LC				Global
Animalia	Acroporidae	*Acropora monticulosa*	Acropora coral	NT	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora nana*	Acropora coral	NT	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora nasuta*	Acropora coral	NT	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora nobilis*	Acropora coral	LC				Global
Animalia	Acroporidae	*Acropora pagoensis*	Acropora coral	DD				Indo-Pacific
Animalia	Acroporidae	*Acropora palmerae*	Acropora coral	VU				Indo-Pacific
Animalia	Acroporidae	*Acropora paniculata*	Acropora coral	VU	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora pharaonis*	Acropora coral	VU				Indo-Pacific
Animalia	Acroporidae	*Acropora polystoma*	Acropora coral	VU	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora prostrata*	Acropora coral	DD				Indo-Pacific
Animalia	Acroporidae	*Acropora pulchra*	Acropora coral	LC	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora rambleri*	Acropora coral	DD				Indo-Pacific
Animalia	Acroporidae	*Acropora retusa*	Acropora coral	VU	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora robusta*	Acropora coral	LC	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora rudis*	Acropora coral	EN				Indo-Pacific
Animalia	Acroporidae	*Acropora samoensis*	Acropora coral	LC	II		B	Indo-Pacific

Animalia	Acroporidae	*Acropora sarmentosa*	Acropora coral	LC	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora schmitti*	Acropora coral	DD				Indo-Pacific
Animalia	Acroporidae	*Acropora secale*	Acropora coral	NT	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora selago*	Acropora coral	NT				Global
Animalia	Acroporidae	*Acropora speciosa*	Acropora coral	VU				Indo-Pacific
Animalia	Acroporidae	*Acropora striata*	Acropora coral	VU	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora subulata*	Acropora coral	LC	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora tenuis*	Acropora coral	NT	II		B	Indo-Pacific
Animalia	Acroporidae	*Acropora teres*	Acropora coral	DD				Indo-Pacific
Animalia	Acroporidae	*Acropora tortuosa*	Acropora coral	LC				Indo-Pacific
Animalia	Acroporidae	*Acropora tutuilensis*	Acropora coral	DD				Global
Animalia	Acroporidae	*Acropora valenciennesi*	Acropora coral	LC	II		B	Global
Animalia	Acroporidae	*Acropora valida*	Acropora coral	LC	II		B	Global
Animalia	Acroporidae	*Acropora vaughani*	Acropora coral	VU				Indo-Pacific
Animalia	Acroporidae	*Acropora verweyi*	Acropora coral	VU	II		B	Indo-Pacific
Animalia	Acroporidae	*Astreopora cucullata*	Astreopora coral	VU				Global
Animalia	Acroporidae	*Astreopora eliptica*	Astreopora coral	DD				Indo-Pacific
Animalia	Acroporidae	*Astreopora gracilis*	Astreopora coral	LC				Global
Animalia	Acroporidae	*Astreopora listeri*	Astreopora coral	LC	II		B	Global
Animalia	Acroporidae	*Astreopora myriophthalma*	Astreopora coral	LC	II		B	Global
Animalia	Acroporidae	*Astreopora randalli*	Astreopora coral	LC				Indo-Pacific
Animalia	Acroporidae	*Astreopora scabra*	Astreopora coral					Indo-Pacific
Animalia	Acroporidae	*Astreopora suggesta*	Astreopora coral	LC	II		B	Indo-Pacific
Animalia	Acroporidae	*Isopora crateriformis*	Isopora coral	LC	II		B	Pacific
Animalia	Acroporidae	*Isopora cuneata*	Isopora coral	LC	II		B	Indo-Pacific
Animalia	Acroporidae	*Isopora palifera*	Isopora coral	NT				Global
Animalia	Acroporidae	*Montipora aequituberculata*	Montipora coral	LC	II		B	Indo-Pacific
Animalia	Acroporidae	*Montipora angulata*	Montipora coral	VU				Indo-Pacific
Animalia	Acroporidae	*Montipora australiensis*	Montipora coral	VU				Indo-Pacific
Animalia	Acroporidae	*Montipora calcarea*	Montipora coral	VU				Global

Animalia	Acroporidae	*Montipora caliculata*	Montipora coral	VU				Indo-Pacific
Animalia	Acroporidae	*Montipora capitata*	Montipora coral	NT				Indo-Pacific
Animalia	Acroporidae	*Montipora corbettensis*	Montipora coral	VU	II		B	Indo-Pacific
Animalia	Acroporidae	*Montipora danae*	Montipora coral	LC	II		B	Global
Animalia	Acroporidae	*Montipora efflorescens*	Montipora coral	NT	II		B	Global
Animalia	Acroporidae	*Montipora effusa*	Montipora coral	NT				Indo-Pacific
Animalia	Acroporidae	*Montipora floweri*	Montipora coral	LC				Global
Animalia	Acroporidae	*Montipora foliosa*	Montipora coral	NT	II		B	Global
Animalia	Acroporidae	*Montipora foveolata*	Montipora coral	NT	II		B	Indo-Pacific
Animalia	Acroporidae	*Montipora grisea*	Montipora coral	LC	II		B	Indo-Pacific
Animalia	Acroporidae	*Montipora hispida*	Montipora coral	LC				indo-Pacific
Animalia	Acroporidae	*Montipora hoffmeisteri*	Montipora coral	LC				Indo-Pacific
Animalia	Acroporidae	*Montipora incrassata*	Montipora coral	NT				Indo-Pacific
Animalia	Acroporidae	*Montipora informis*	Montipora coral	LC				Global
Animalia	Acroporidae	*Montipora lobulata*	Montipora coral	VU				Indo-Pacific
Animalia	Acroporidae	*Montipora millepora*	Montipora coral	LC				Global
Animalia	Acroporidae	*Montipora nodosa*	Montipora coral	NT	II		B	Global
Animalia	Acroporidae	*Montipora spumosa*	Montipora coral					Global
Animalia	Acroporidae	*Montipora tuberculosa*	Montipora coral	LC	II		B	Global
Animalia	Acroporidae	*Montipora turgescens*	Montipora coral	LC	II		B	Indo-Pacific
Animalia	Acroporidae	*Montipora vaughani*	Montipora coral	DD				Restricted (American Samoa, Samoa)
Animalia	Acroporidae	*Montipora venosa*	Montipora coral	NT	II		B	Global
Animalia	Acroporidae	*Montipora verrucosa*	Montipora coral	LC	II		B	Global
Animalia	Agariciidae	*Gardineroseris planulata*	Agaricid coral	LC				Global
Animalia	Agariciidae	*Leptoseris explanata*	Leptoseris coral	LC	II		B	Indo-Pacific
Animalia	Agariciidae	*Leptoseris foliosa*	Leptoseris coral	LC				Global
Animalia	Agariciidae	*Leptoseris gardineri*	Leptoseris coral	LC				Indo-Pacific
Animalia	Agariciidae	*Leptoseris hawaiiensis*	Leptoseris coral	LC				Global
Animalia	Agariciidae	*Leptoseris incrustans*	Leptoseris coral	VU				Global
Animalia	Agariciidae	*Leptoseris mycetoseroides*	Leptoseris coral	LC	II		B	Global

Animalia	Agariciidae	*Leptoseris scabra*	Leptoseris coral	LC				Global
Animalia	Agariciidae	*Leptoseris solida*	Leptoseris coral	LC				Global
Animalia	Agariciidae	*Leptoseris yabei*	Leptoseris coral	VU				Global
Animalia	Agariciidae	*Pachyseris gemmae*	Pachyseris coral	NT				Indo-Pacific
Animalia	Agariciidae	*Pachyseris rugosa*	Pachyseris coral	VU	II		B	Global
Animalia	Agariciidae	*Pachyseris speciosa*	Pachyseris coral	LC	II		B	Global
Animalia	Agariciidae	*Pavona bipartita*	Pavona coral	VU				Global
Animalia	Agariciidae	*Pavona cactus*	Pavona coral	VU				Global
Animalia	Agariciidae	*Pavona clavus*	Pavona coral	LC				Global
Animalia	Agariciidae	*Pavona decussata*	Pavona coral	VU	II		B	Global
Animalia	Agariciidae	*Pavona duerdeni*	Pavona coral	LC	II		B	Indo-Pacific
Animalia	Agariciidae	*Pavona explanulata*	Pavona coral	LC				Global
Animalia	Agariciidae	*Pavona frondifera*	Pavona coral	LC	II		B	Global
Animalia	Agariciidae	*Pavona gigantea*	Pavona coral	LC				Global
Animalia	Agariciidae	*Pavona maldivensis*	Pavona coral	LC	II		B	Global
Animalia	Agariciidae	*Pavona minuta*	Pavona coral	NT				Indo-Pacific
Animalia	Agariciidae	*Pavona varians*	Pavona coral	LC	II		B	Global
Animalia	Agariciidae	*Pavona venosa*	Pavona coral	VU	II		B	Indo-Pacific
Animalia	Astrocoeniidae	*Madracis kirbyi*	Massive coral	LC				Global
Animalia	Astrocoeniidae	*Stylocoeniella armata*	Coral	LC				Global
Animalia	Astrocoeniidae	*Stylocoeniella guentheri*	Coral	LC				Global
Animalia	Caryophylliidae	*Caryophyllia scobinosa*	Cayophyllid coral		II		B	Global
Animalia	Caryophylliidae	*Euphyllia cristata*	Euphyllia coral	VU				Indo-Pacific
Animalia	Caryophylliidae	*Euphyllia glabrescens*	Euphyllia coral	NT	II		B	Indo-Pacific
Animalia	Caryophylliidae	*Euphyllia paradivisa*	Euphyllia coral	VU				Indo-Pacific
Animalia	Dendrophylliidae	*Turbinaria frondens*	Turbinaria coral	LC				Global
Animalia	Dendrophylliidae	*Turbinaria irregularis*	Turbinaria coral	LC				Global
Animalia	Dendrophylliidae	*Turbinaria mesenterina*	Turbinaria coral	VU	II		B	Global
Animalia	Dendrophylliidae	*Turbinaria peltata*	Turbinaria coral	VU				Indo-Pacific
Animalia	Dendrophylliidae	*Turbinaria reniformis*	Turbinaria coral	VU	II		B	Global

Animalia	Dendrophylliidae	*Turbinaria stellulata*	Turbinaria coral	VU				Global
Animalia	Euphyllidae	*Plerogyra simplex*	Euphyllid coral	NT				Indo-Pacific
Animalia	Euphyllidae	*Plerogyra sinuosa*	Euphyllid coral	NT				Global
Animalia	Faviidae	*Barabattoia amicorum*	Faviid coral	LC				Global
Animalia	Faviidae	*Caulastraea furcata*	Caulastrea coral	LC	II		B	Indo-Pacific
Animalia	Faviidae	*Caulastrea echinulata*	Caulastrea coral	VU				Indo-Pacific
Animalia	Faviidae	*Cyphastrea chalcidicum*	Cyphastrea coral	LC	II		B	Global
Animalia	Faviidae	*Cyphastrea microphthalma*	Cyphastrea coral	LC				Global
Animalia	Faviidae	*Cyphastrea serailia*	Cyphastrea coral	LC	II		B	Global
Animalia	Faviidae	*Diploastrea heliopora*	Diploastrea coral	NT	II		B	Global
Animalia	Faviidae	*Echinopora gemmacea*	Echinopora coral	LC	II		B	Global
Animalia	Faviidae	*Echinopora lamellosa*	Echinopora coral	LC	II		B	Global
Animalia	Faviidae	*Echinopora pacificus*	Echinopora coral	NT	II		B	Indo-Pacific
Animalia	Faviidae	*Favia favus*	Favia coral	LC	II		B	Global
Animalia	Faviidae	*Favia matthaii*	Favia coral	NT	II		B	Indo-Pacific
Animalia	Faviidae	*Favia pallida*	Favia coral	LC				Global
Animalia	Faviidae	*Favia rotumana*	Favia coral	LC				Global
Animalia	Faviidae	*Favia speciosa*	Favia coral	LC	II		B	Global
Animalia	Faviidae	*Favia stelligera*	Favia coral	NT	II		B	Global
Animalia	Faviidae	*Favites abdita*	Favites coral	NT	II		B	Global
Animalia	Faviidae	*Favites complanata*	Favites coral	NT				Global
Animalia	Faviidae	*Favites flexuosa*	Favites coral	NT	II		B	Global
Animalia	Faviidae	*Favites halicora*	Favites coral	NT	II		B	Global
Animalia	Faviidae	*Favites pentagona*	Favites coral	LC				Global
Animalia	Faviidae	*Favites russelli*	Favites coral	NT	II		B	Indo-Pacific
Animalia	Faviidae	*Goniastrea aspera*	Goniastrea coral	LC	II		B	Indo-Pacific
Animalia	Faviidae	*Goniastrea australensis*	Goniastrea coral	LC	II		B	Indo-Pacific
Animalia	Faviidae	*Goniastrea edwardsi*	Goniastrea coral	LC	II		B	Indo-Pacific
Animalia	Faviidae	*Goniastrea favulus*	Goniastrea coral	NT				Indo-Pacific
Animalia	Faviidae	*Goniastrea minuta*	Goniastrea coral	NT				Indo-Pacific

Animalia	Faviidae	*Goniastrea palauensis*	Goniastrea coral	NT				Indo-Pacific
Animalia	Faviidae	*Goniastrea pectinata*	Goniastrea coral	LC	II		B	Global
Animalia	Faviidae	*Goniastrea retiformis*	Goniastrea coral	LC	II		B	Global
Animalia	Faviidae	*Leptastrea bewickensis*	Leptastrea coral	NT	II		B	Indo-Pacific
Animalia	Faviidae	*Leptastrea bottae*	Leptastrea coral	NT				Global
Animalia	Faviidae	*Leptastrea pruinosa*	Leptastrea coral	LC				Global
Animalia	Faviidae	*Leptastrea purpurea*	Leptastrea coral	LC	II		B	Global
Animalia	Faviidae	*Leptastrea transversa*	Leptastrea coral	LC	II		B	Global
Animalia	Faviidae	*Leptoria phrygia*	Leptoria coral	NT	II		B	Global
Animalia	Faviidae	*Montastrea annuligera*	Montastrea coral	NT				Global
Animalia	Faviidae	*Montastrea colemani*	Montastrea coral	NT				Indo-Pacific
Animalia	Faviidae	*Montastrea curta*	Montastrea coral	LC	II		B	Global
Animalia	Faviidae	*Montastrea magnistellata*	Montastrea coral	NT				Global
Animalia	Faviidae	*Oulophyllia bennettae*	Oulophyllia coral	NT	II		B	Indo-Pacific
Animalia	Faviidae	*Oulophyllia crispa*	Oulophyllia coral	NT	II		B	Indo-Pacific
Animalia	Faviidae	*Platygyra daedalea*	Brain coral	LC	II		B	Global
Animalia	Faviidae	*Platygyra lamellina*	Brain coral	NT	II		B	Indo-Pacific
Animalia	Faviidae	*Platygyra pini*	Brain coral	LC	II		B	Global
Animalia	Faviidae	*Platygyra ryukyuensis*	Brain coral	NT				Indo-Pacific
Animalia	Faviidae	*Platygyra sinensis*	Brain coral	LC	II		B	Indo-Pacific
Animalia	Faviidae	*Plesiastrea versipora*	Plesiastrea coral	LC	II		B	Global
Animalia	Fungiidae	*Ctenactis crassa*	Mushroom coral	LC				Global
Animalia	Fungiidae	*Ctenactis echinata*	Mushroom coral	LC				Global
Animalia	Fungiidae	*Danafungia horrida*	Mushroom coral		II		B	Indo-Pacific
Animalia	Fungiidae	*Fungia concinna*	Mushroom coral	LC	II		B	Global
Animalia	Fungiidae	*Fungia costulata*	Mushroom coral	LC	II		B	Global
Animalia	Fungiidae	*Fungia fragilis*	Mushroom coral	LC	II		B	Indo-Pacific
Animalia	Fungiidae	*Fungia fungites*	Mushroom coral	NT	II		B	Global
Animalia	Fungiidae	*Fungia granulosa*	Mushroom coral	LC				Global
Animalia	Fungiidae	*Fungia horrida*	Mushroom coral	LC	II		B	Global

Animalia	Fungiidae	*Fungia moluccensis*	Mushroom coral	LC	II		B	Indo-Pacific
Animalia	Fungiidae	*Fungia paumotensis*	Mushroom coral	LC				Global
Animalia	Fungiidae	*Fungia repanda*	Mushroom coral	LC	II		B	Indo-Pacific
Animalia	Fungiidae	*Fungia scruposa*	Mushroom coral	LC	II		B	Global
Animalia	Fungiidae	*Fungia scutaria*	Mushroom coral	LC	II		B	Global
Animalia	Fungiidae	*Fungia sinensis*	Mushroom coral	LC				Indo-Pacific
Animalia	Fungiidae	*Fungia tenuis*	Mushroom coral	LC				Global
Animalia	Fungiidae	*Fungia vaughani*	Mushroom coral	LC	II		B	Indo-Pacific
Animalia	Fungiidae	*Halomitra pileus*	Mushroom coral	LC	II		B	Indo-Pacific
Animalia	Fungiidae	*Herpolitha limax*	Mushroom coral	LC	II		B	Global
Animalia	Fungiidae	*Lithophyllon undulatum*	Mushroom coral	NT	II		B	Indo-Pacific
Animalia	Fungiidae	*Podabacia crustacea*	Mushroom coral	LC				Global
Animalia	Fungiidae	*Polyphyllia novaehiberniae*	Mushroom coral	NT	II		B	Indo-Pacific
Animalia	Fungiidae	*Sandalolitha dentata*	Mushroom coral	LC	II		B	Indo-Pacific
Animalia	Merulinidae	*Hydnophora exesa*	Hydnophora coral	NT	II		B	Global
Animalia	Merulinidae	*Hydnophora microconos*	Hydnophora coral	NT				Global
Animalia	Merulinidae	*Hydnophora rigida*	Hydnophora coral	LC	II		B	Indo-Pacific
Animalia	Merulinidae	*Merulina ampliata*	Merulina coral	LC	II		B	Global
Animalia	Merulinidae	*Merulina scabricula*	Merulina coral	LC	II		B	Indo-Pacific
Animalia	Merulinidae	*Scapophyllia cylindrica*	Merulinid coral	LC				Indo-Pacific
Animalia	Mussidae	*Acanthastrea brevis*	Acanthastrea coral	VU				Indo-Pacific
Animalia	Mussidae	*Acanthastrea echinata*	Acanthastrea coral	LC	II		B	Global
Animalia	Mussidae	*Acanthastrea hemprichii*	Acanthastrea coral	VU	II		B	Indo-Pacific
Animalia	Mussidae	*Acanthastrea hillae*	Acanthastrea coral	NT	II		B	Global
Animalia	Mussidae	*Acanthastrea ishigakiensis*	Acanthastrea coral	VU				Indo-Pacific
Animalia	Mussidae	*Lobophyllia corymbosa*	Mussid coral	LC				Global
Animalia	Mussidae	*Lobophyllia hemprichii*	Mussid coral	LC				Global
Animalia	Mussidae	*Lobophyllia robusta*	Mussid coral	LC				Global
Animalia	Mussidae	*Scolymia vitiensis*	Mussid coral	NT				Indo-Pacific
Animalia	Mussidae	*Symphyllia radians*	Mussid coral	LC				Global

Animalia	Mussidae	*Symphyllia recta*	Mussid coral	LC	II		B	Indo-Pacific
Animalia	Mussidae	*Symphyllia valenciennesii*	Mussid coral	LC				Global
Animalia	Oculinidae	*Galaxea astreata*	Galaxea coral	VU				Global
Animalia	Oculinidae	*Galaxea fascicularis*	Galaxea coral	NT	II		B	Indo-Pacific
Animalia	Oculinidae	*Galaxea horrescens*	Galaxea coral	LC				Indo-Pacific
Animalia	Oculinidae	*Galaxea paucisepta*	Galaxea coral	NT	II		B	Indo-Pacific
Animalia	Pectiniidae	*Echinomorpha nishihirai*	Pectinid coral	NT				Indo-Pacific
Animalia	Pectiniidae	*Echinophyllia aspera*	Echinophyllia coral	LC	II		B	Global
Animalia	Pectiniidae	*Echinophyllia echinata*	Echinophyllia coral	LC				Global
Animalia	Pectiniidae	*Echinophyllia echinoporoides*	Echinophyllia coral	LC				Indo-Pacific
Animalia	Pectiniidae	*Mycedium elephantotus*	Mycedium coral	LC	II		B	Global
Animalia	Pectiniidae	*Mycedium robokaki*	Mycedium coral	LC	II		B	Indo-Pacific
Animalia	Pectiniidae	*Oxypora crassispinosa*	Oxypora coral	LC	II		B	Indo-Pacific
Animalia	Pectiniidae	*Oxypora lacera*	Oxypora coral	LC				Global
Animalia	Pocilloporidae	*Pocillopora capitata*	Pocillopora coral	LC				Global
Animalia	Pocilloporidae	*Pocillopora damicornis*	Cauliflower coral	LC	II		B	Global
Animalia	Pocilloporidae	*Pocillopora danae*	Pocillopora coral	VU	II		B	Pacific
Animalia	Pocilloporidae	*Pocillopora elegans*	Pocillopora coral	VU				Global
Animalia	Pocilloporidae	*Pocillopora eydouxi*	Pocillopora coral	NT	II		B	Global
Animalia	Pocilloporidae	*Pocillopora indiania*	Pocillopora coral	VU	II		B	Indo-Pacific
Animalia	Pocilloporidae	*Pocillopora ligulata*	Pocillopora coral	LC				Global
Animalia	Pocilloporidae	*Pocillopora meandrina*	Pocillopora coral	LC	II		B	Global
Animalia	Pocilloporidae	*Pocillopora setichelli*	Pocillopora coral	LC				Pacific
Animalia	Pocilloporidae	*Pocillopora verrucosa*	Rasp coral	LC	II		B	Global
Animalia	Pocilloporidae	*Pocillopora woodjonesi*	Pocillopora coral	LC	II		B	Global
Animalia	Pocilloporidae	*Seriatopora hystrix*	Seriatopora coral	LC	II		B	Global
Animalia	Pocilloporidae	*Stylophora pistillata*	Stylophora coral	NT	II		B	Global
Animalia	Poritidae	*Alveopora allingi*	Alveopora coral	VU	II		B	Indo-Pacific
Animalia	Poritidae	*Alveopora spongiosa*	Alveopora coral	NT				Global
Animalia	Poritidae	*Alveopora verrilliana*	Alveopora coral	VU	II		B	Indo-Pacific

Animalia	Poritidae	*Goniopora columna*	Goniopora coral	NT	II		B	Indo-Pacific
Animalia	Poritidae	*Goniopora fruticosa*	Goniopora coral	LC				Indo-Pacific
Animalia	Poritidae	*Goniopora lobata*	Goniopora coral	NT	II		B	Indo-Pacific
Animalia	Poritidae	*Goniopora minor*	Goniopora coral	NT				Global
Animalia	Poritidae	*Goniopora somaliensis*	Goniopora coral	LC				Global
Animalia	Poritidae	*Goniopora stutchburyi*	Goniopora coral	LC				Indo-Pacific
Animalia	Poritidae	*Porites annae*	Porites coral	NT	II		B	Indo-Pacific
Animalia	Poritidae	*Porites arnaudi*	Porites coral	LC				Pacific
Animalia	Poritidae	*Porites australiensis*	Porites coral	LC				Indo-Pacific
Animalia	Poritidae	*Porites cylindrica*	Porites coral	NT	II		B	Indo-Pacific
Animalia	Poritidae	*Porites horizontalata*	Porites coral	VU				Indo-Pacific
Animalia	Poritidae	*Porites latistella*	Porites coral	LC				Indo-Pacific
Animalia	Poritidae	*Porites lichen*	Porites coral	LC				Indo-Pacific
Animalia	Poritidae	*Porites lobata*	Porites coral	NT	II		B	Global
Animalia	Poritidae	*Porites lutea*	Porites coral	LC	II		B	Global
Animalia	Poritidae	*Porites monticulosa*	Porites coral	LC				Global
Animalia	Poritidae	*Porites murrayensis*	Porites coral	NT				Indo-Pacific
Animalia	Poritidae	*Porites nigrescens*	Porites coral	VU	II		B	Indo-Pacific
Animalia	Poritidae	*Porites rus*	Porites coral	LC	II		B	Global
Animalia	Poritidae	*Porites solida*	Porites coral	LC				Global
Animalia	Poritidae	*Porites vaughani*	Porites coral	LC				Indo-Pacific
Animalia	Poritidae	*Stylaraea punctata*	Porites coral	DD				Indo-Pacific
Animalia	Siderastreidae	*Coscinaraea columna*	Coscinaraea coral	LC	II		B	Indo-Pacific
Animalia	Siderastreidae	*Coscinaraea exesa*	Coscinaraea coral	LC				Indo-Pacific
Animalia	Siderastreidae	*Psammocora contigua*	Psammocora coral	NT	II		B	Global
Animalia	Siderastreidae	*Psammocora digitata*	Psammocora coral	NT				Indo-Pacific
Animalia	Siderastreidae	*Psammocora explanulata*	Psammocora coral	LC				Global
Animalia	Siderastreidae	*Psammocora haimeana*	Psammocora coral	LC	II		B	Global
Animalia	Siderastreidae	*Psammocora nierstraszi*	Psammocora coral	LC	II		B	Global
Animalia	Siderastreidae	*Psammocora profundacella*	Psammocora coral	LC	II		B	Global

Animalia	Siderastreidae	*Psammocora superficialis*	Psammocora coral	LC				Global
Animalia	Helioporidae	*Heliopora coerulea*	Blue coral	VU				Global
Animalia	Milleporidae	*Millepora dichotoma*	Fire coral	LC				Global
Animalia	Milleporidae	*Millepora exaesa*	Fire coral	LC	II		B	Global
Animalia	Milleporidae	*Millepora foveolata*	Fire coral	VU				Indo-Pacific
Animalia	Milleporidae	*Millepora intricata*	Fire coral	LC				Indo-Pacific
Animalia	Milleporidae	*Millepora murrayi*	Fire coral	NT				Indo-Pacific
Animalia	Milleporidae	*Millepora platyphylla*	Fire coral	LC	II		B	Global
Animalia	Milleporidae	*Millepora tenera*	Fire coral	LC				Global
Animalia	Stylasteridae	*Stylaster sanguineus*	Stylaster coral		II		B	Indo-Pacific
Animalia	Holothuriidae	*Actinopyga echinites*	Brownfish	VU				Global
Animalia	Holothuriidae	*Actinopyga lecanora*	White-bottomed sea cucumber	DD				Uncertain (AS)
Animalia	Holothuriidae	*Actinopyga mauritiana*	Surf redfish	VU				Global
Animalia	Holothuriidae	*Actinopyga miliaris*	Hairy blackfish	VU				Uncertain (AS)
Animalia	Holothuriidae	*Bohadschia argus*	Leopardfish	LC				Indo-Pacific
Animalia	Holothuriidae	*Bohadschia similis*	Brownspotted sandfish	DD				Indo-Pacific
Animalia	Holothuriidae	*Bohadschia vitiensis*	Brown sandfish	DD				Indo-Pacific
Animalia	Holothuriidae	*Labidodemas pertinax*	Sea cucumber	LC				Indo-Pacific
Animalia	Holothuriidae	*Labidodemas semperianum*	Sea cucumber	LC				Global
Animalia	Holothuriidae	*Pearsonothuria graeffei*	Graeffe's sea cucumber	LC				Global
Animalia	Stichopodidae	*Stichopus chloronotus*	Greenfish	LC				Global
Animalia	Stichopodidae	*Stichopus herrmanni*	Curryfish	VU				Indo-Pacific
Animalia	Stichopodidae	*Stichopus horrens*	Peanutfish	DD				Global
Animalia	Stichopodidae	*Stichopus monotuberculatus*	Sea cucumber	DD				Global
Animalia	Stichopodidae	*Thelenota anax*	Amberfish	DD				Indo-Pacific
Animalia	Holothuriidae	*Holothuria arenicola*	Sand sea cucumber	DD				Global
Animalia	Holothuriidae	*Holothuria atra*	Lollyfish	LC				Global
Animalia	Holothuriidae	*Holothuria cinerascens*	Tufted sea cucumber	LC				Global
Animalia	Holothuriidae	*Holothuria coluber*	Snakefish	LC				Indo-Pacific
Animalia	Holothuriidae	*Holothuria difficilis*	Difficult sea cucumber	LC				Global

Animalia	Holothuriidae	*Holothuria discrepans*	Sea cucumber	DD				Global
Animalia	Holothuriidae	*Holothuria edulis*	Pinkfish	LC				Global
Animalia	Holothuriidae	*Holothuria erinaceaus*	Sea cucumber	LC				Indo-Pacific
Animalia	Holothuriidae	*Holothuria excellens*	Sea cucumber	DD				Pacific
Animalia	Holothuriidae	*Holothuria flavomaculata*	Red snakefish	LC				Global
Animalia	Holothuriidae	*Holothuria fuscocinerea*	Ashy pink sea cucumber	LC				Global
Animalia	Holothuriidae	*Holothuria fuscogilva*	White teatfish	VU				Global
Animalia	Holothuriidae	*Holothuria fuscopunctata*	Elephant trunkfish	LC				Global
Animalia	Holothuriidae	*Holothuria hilla*	Tiger tail sea cucumber	LC				Global
Animalia	Holothuriidae	*Holothuria immobilis*	Sea cucumber	LC				Indo-Pacific
Animalia	Holothuriidae	*Holothuria impatiens*	Impatient sea cucumber	DD				Global
Animalia	Holothuriidae	*Holothuria inhabilis*	Sea cucumber	LC				Global
Animalia	Holothuriidae	*Holothuria kubaryi*	Sea cucumber	DD				Restricted (American Samoa, Samoa, Solomon Islands)
Animalia	Holothuriidae	*Holothuria lessoni*	Golden sandfish	EN				Indo-Pacific
Animalia	Holothuriidae	*Holothuria leucospilota*	White threadfish	LC				Global
Animalia	Holothuriidae	*Holothuria olivacea*	Sea cucumber	DD				Indo-Pacific
Animalia	Holothuriidae	*Holothuria pardalis*	Sea cucumber	LC				Global
Animalia	Holothuriidae	*Holothuria pervicax*	Stubborn sea cucumber	LC				Indo-Pacific
Animalia	Holothuriidae	*Holothuria rigida*	Rigid sea cucumber	LC				Global
Animalia	Holothuriidae	*Holothuria samoana*	Samoan sea cucumber	DD				Indo-Pacific
Animalia	Holothuriidae	*Holothuria scabra*	Sandfish	EN				Global
Animalia	Holothuriidae	*Holothuria verrucosa*	Sea cucumber	LC				Global
Animalia	Holothuriidae	*Holothuria whitmaei*	Black teatfish	EN	II		B	Indo-Pacific
Animalia	Ostreidae	*Saccostrea circumsuta*	Rock oyster	DD				Indo-Pacific
Animalia	Ostreidae	*Saccostrea scyphophilla*	Coral rock oyster	LC				Global
Animalia	Tridacnidae	*Hippopus hippopus*	Horseshoe clam	CD	II		B	Indo-Pacific
Animalia	Tridacnidae	*Tridacna derasa*	Southern giant clam	VU	II		B	Indo-Pacific
Animalia	Tridacnidae	*Tridacna gigas*	Giant clam	VU	II		B	Indo-Pacific
Animalia	Tridacnidae	*Tridacna maxima*	Small giant clam	CD	II		B	Global
Animalia	Tridacnidae	*Tridacna squamosa*	Fluted giant clam	CD	II		B	Global

Animalia	Neritidae	*Neripteron bensoni*	Gastropod	LC				Indo-Pacific
Animalia	Neritidae	*Neritilia vulgaris*	Gastropod	LC				Indo-Pacific
Animalia	Ellobiidae	*Melampus luteus*	Yellow melampus	LC				Indo-Pacific
Animalia	Ellobiidae	*Melampus striatus*	Striped melampus	LC				Pacific
Animalia	Conidae	*Conus acutangulus*	Sharp-angled cone	LC				Global
Animalia	Conidae	*Conus adamsonii*	Rhododendron cone	LC				Pacific
Animalia	Conidae	*Conus ammiralis*	Admiral cone	LC				Indo-Pacific
Animalia	Conidae	*Conus arenatus*	Sand-dusted cone	LC				Indo-Pacific
Animalia	Conidae	*Conus aulicus*	Princely cone	LC				Indo-Pacific
Animalia	Conidae	*Conus aureus*	Aureus cone	LC				Indo-Pacific
Animalia	Conidae	*Conus auricomus*	Gold-leaf cone	LC				Indo-Pacific
Animalia	Conidae	*Conus balteatus*	Mauritian cone	LC				Indo-Pacific
Animalia	Conidae	*Conus bandanus*	Banded marble cone	LC				Indo-Pacific
Animalia	Conidae	*Conus bullatus*	Bubble cone	LC				Indo-Pacific
Animalia	Conidae	*Conus canonicus*	Tiger cone	LC				Indo-Pacific
Animalia	Conidae	*Conus capitaneus*	Captain cone	LC				Global
Animalia	Conidae	*Conus catus*	Cat cone	LC				Global
Animalia	Conidae	*Conus chaldaeus*	Worm cone	LC				Global
Animalia	Conidae	*Conus circumactus*	Cone	LC				Indo-Pacific
Animalia	Conidae	*Conus coffeae*	Coffee cone	LC				Indo-Pacific
Animalia	Conidae	*Conus coronatus*	Crowned cone	LC				Global
Animalia	Conidae	*Conus crocatus*	Saffron cone	LC				Indo-Pacific
Animalia	Conidae	*Conus cylindraceus*	Cylindrical cone	LC				Indo-Pacific
Animalia	Conidae	*Conus distans*	Distant cone	LC				Global
Animalia	Conidae	*Conus ebraeus*	Black-and-white cone	LC				Global
Animalia	Conidae	*Conus eburneus*	Ivory cone	LC				Indo-Pacific
Animalia	Conidae	*Conus emaciatus*	False virgin cone	LC				Global
Animalia	Conidae	*Conus episcopatus*	Dignified cone	LC				Indo-Pacific
Animalia	Conidae	*Conus exiguus*	Cabrit's cone	LC				Restricted (American Samoa, Samoa, New Caledonia)
Animalia	Conidae	*Conus ferrugineus*	Cone	LC				Indo-Pacific

Animalia	Conidae	*Conus flavidus*	Yellow Pacific cone	LC				Uncertain (AS)
Animalia	Conidae	*Conus floccatus*	Snow-flaked cone	LC				Pacific
Animalia	Conidae	*Conus frigidus*	Frigid cone	LC				Indo-Pacific
Animalia	Conidae	*Conus generalis*	General cone	LC				Indo-Pacific
Animalia	Conidae	*Conus geographus*	Geography cone	LC				Indo-Pacific
Animalia	Conidae	*Conus glans*	Acorn cone	LC				Indo-Pacific
Animalia	Conidae	*Conus gloriamaris*	Glory of the Sea cone	LC				Indo-Pacific
Animalia	Conidae	*Conus imperialis*	Imperial cone	LC				Indo-Pacific
Animalia	Conidae	*Conus legatus*	Ambassador cone	LC				Indo-Pacific
Animalia	Conidae	*Conus leopardus*	Leopard cone	LC				Indo-Pacific
Animalia	Conidae	*Conus litoglyphus*	Lithograph cone	LC				Indo-Pacific
Animalia	Conidae	*Conus litteratus*	Lettered cone	LC				Indo-Pacific
Animalia	Conidae	*Conus lividus*	Livid cone	LC				Indo-Pacific
Animalia	Conidae	*Conus magnificus*	Magnificent cone	LC				Pacific
Animalia	Conidae	*Conus miles*	Soldier cone	LC				Indo-Pacific
Animalia	Conidae	*Conus miliaris*	thousand-spot cone	LC				Global
Animalia	Conidae	*Conus mitratus*	Mitred cone	LC				Indo-Pacific
Animalia	Conidae	*Conus moreleti*	Cone	LC				Indo-Pacific
Animalia	Conidae	*Conus muriculatus*	Muricate cone	LC				Indo-Pacific
Animalia	Conidae	*Conus nimbosus*	Stormy cone	LC				Indo-Pacific
Animalia	Conidae	*Conus nussatella*	Nussatella cone	LC				Global
Animalia	Conidae	*Conus obscurus*	Obscure cone	LC				Indo-Pacific
Animalia	Conidae	*Conus pertusus*	Pertusus cone	LC				Indo-Pacific
Animalia	Conidae	*Conus planorbis*	Planorbis cone	LC				Indo-Pacific
Animalia	Conidae	*Conus pulicarius*	Flea cone	LC				Indo-Pacific
Animalia	Conidae	*Conus quercinus*	Oak cone	LC				Indo-Pacific
Animalia	Conidae	*Conus rattus*	Rat cone	LC				Indo-Pacific
Animalia	Conidae	*Conus retifer*	Netted cone	LC				Indo-Pacific
Animalia	Conidae	*Conus sanguinolentus*	Blood-stained cone	LC				Global
Animalia	Conidae	*Conus sponsalis*	Sponsal cone	LC				Global

Animalia	Conidae	*Conus striatus*	Striated cone	LC				Indo-Pacific
Animalia	Conidae	*Conus terebra*	Cone	LC				Global
Animalia	Conidae	*Conus tessulatus*	Tessellated cone	LC				Global
Animalia	Conidae	*Conus textile*	Textile cone	LC				Indo-Pacific
Animalia	Conidae	*Conus tulipa*	Tulip cone	LC				Indo-Pacific
Animalia	Conidae	*Conus varius*	Freckled cone	LC				Indo-Pacific
Animalia	Conidae	*Conus vexillum*	Vexillum cone	LC				Indo-Pacific
Animalia	Conidae	*Conus virgo*	Cone	LC				Global
Plantae	Cymodoceaceae	*Syringodium isoetifolium*	Seagrass	LC				Global
Plantae	Hydrocharitaceae	*Halophila ovalis*	Seagrass	LC				Global
Plantae	Hydrocharitaceae	*Halophila ovata*	Seagrass	LC				Global
Plantae	Pandanaceae	*Pandanus tectorius*	Beach pandanus	LC				Indo-Pacific
Plantae	Poaceae	*Paspalum conjugatum*	Buffalo grass	LC				Indo-Pacific
Plantae	Fabaceae	*Vigna marina*	Dune-bean	LC				Global
Plantae	Calophyllaceae	*Calophyllum inophyllum*	Tamanu	LC				Indo-Pacific
Plantae	Malvaceae	*Hibiscus tiliaceus*	Coast cottonwood	LC				Global
Plantae	Malvaceae	*Thespesia populnea*	Portia tree	LC				Uncertain (AS)
Plantae	Combretaceae	*Terminalia catappa*	Tavola	LC				Indo-Pacific
Plantae	Lythraceae	*Pemphis acidula*	Halophyte shrub	LC				Uncertain (AS)
Plantae	Rhizophoraceae	*Bruguiera gymnorhiza*	Large-leafed orange mangrove	LC				Indo-Pacific
Plantae	Rhizophoraceae	*Rhizophora samoensis*	Red mangrove	NT				Global