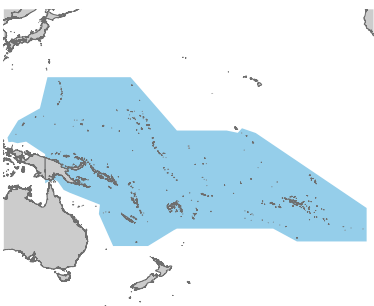
THE CONSERVATION STATUS OF MARINE BIODIVERSITY OF THE PACIFIC ISLANDS OF OCEANIA

H. Pippard, G.M. Ralph, M.S. Harvey, K.E. Carpenter, J.R. Buchanan, D.W. Greenfield, H.D. Harwell, H.K. Larson, A. Lawrence, C. Linardich, K. Matsuura, H. Motomura, T.A. Munroe, R.F. Myers, B.C. Russell, W.F. Smith-Vaniz, J.-C. Vié, R.R. Thaman, J.T. Williams

PACIFIC ISLANDS OF OCEANIA



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Published and prepared by IUCN (International Union for Conservation of Nature)

This publication has been made possible in part by funding from Agence Française de Développement (AFD).

Published by: IUCN, Gland, Switzerland

Citation: H. Pippard, G.M. Ralph, M.S. Harvey, K.E. Carpenter, J.R. Buchanan, D.W. Greenfield, H.D. Harwell, H.K. Larson, A. Lawrence, C. Linardich, K. Matsuura, H. Motomura, T.A. Munroe, R.F. Myers, B.C. Russell, W.F. Smith-Vaniz, J.-C. Vié, R.R. Thaman, J.T. Williams (2017). *The Conservation Status of Marine Biodiversity of the Pacific Islands of Oceania*. Gland, Switzerland: IUCN. viii + 59 pp.

ISBN: 978-2-8317-1844-6

DOI: 10.2305/IUCN.CH.2017.04.en

Cover photo: *Paracirrhites forsteri*, Fiji © H. Pippard.

Layout by: Emilie Stump and Gina Ralph

Available from: www.iucn.org/resources/publications

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Acknowledgements

This project represents a major expansion of the IUCN Red List process in the Pacific Islands of Oceania, and could not have been completed without numerous donors and hundreds of experts. The most recent assessments were completed with the generous support of the Agence Française de Développement. We also thank Roger McManus and Jean-Christophe Vié for their guidance and support of the Global Marine Species Assessment initiative of the Marine Biodiversity Unit of IUCN's Global Species Programme.

IUCN's Red Listing process relies on the willingness of scientists to contribute and pool their collective knowledge on species, in order to make the most reliable and up-to-date assessments. Without such commitment, this kind of regional overview would not be possible. We would therefore like to acknowledge and thank the following people who gave their time and valuable expertise during the most recent workshops: David Greenfield, Helen Larson, Alice Lawrence, Keiichi Matsuura, Hiroyuki Motomura, Tom Munroe, Robert Myers, Barry Russell, William Smith-Vaniz, Randolph R. Thaman, Jeff Williams and Ivor Williams.

Coordination of the workshops was carried out by Helen Pippard of IUCN Oceania with support from Kent Carpenter and Gina Ralph of the Marine Biodiversity Unit of IUCN's Global Species Programme.

Workshop facilitation and support were provided by Gina Ralph and Mike Harvey of the Marine Biodiversity Unit, Heather Harwell of Christopher Newport University and Helen Pippard of IUCN Oceania.

Data collection pre-workshop and editing of species accounts post-workshop was led by the Marine Biodiversity Unit and particular acknowledgement and thanks go to Gina Ralph for her involvement, support and guidance. We especially thank Jack Buchanan, Jessica Deal, Claire Gorman, Christi Linardich and Emilie Stump for their tireless efforts, as well as numerous undergraduate interns who contributed to the process. We greatly appreciate the efforts of Caroline Pollock and Max Fancourt to review the new bony fish assessments.

The species distribution maps were digitized through the combined efforts of all of the experts mentioned above, along with Mike Harvey, Christi Linardich, Jack Buchanan and Gina Ralph of the Marine Biodiversity Unit, who we are thankful to for preparing, editing and finalizing the species distribution maps. We also thank two peer-reviewers for their helpful comments.

Expert participants at the assessment workshops, March 2015, Fiji.

Executive Summary

The Pacific Islands of Oceania are small islands and atolls occurring over a vast expanse of ocean that are characterized by immense biodiversity and endemism. Home to at least 44,000 species, the Pacific Islands are poorly known, with innumerable species awaiting discovery.

This project represents a major expansion of the coverage of the Pacific Islands' marine biodiversity on the IUCN Red List of Threatened Species. In 2008, only about 200 Pacific Island marine species were assessed; now, extinction risk assessments have been undertaken for over 2,800 species. These include all known species in select plant and invertebrate taxa: seagrasses, mangroves, reef-building corals, cone snails and commercially exploited sea cucumbers. In addition, a number of marine vertebrate clades have been completed, including marine mammals, sea birds, sea turtles, chondrichthyans, and a subset of the bony fishes. However, the current representation of the Pacific Islands' marine biodiversity is less than half of the region's known marine vertebrates, and an even smaller fraction of the invertebrates.

Across these 2,800 marine species assessements, the best estimate for the proportion of threatened species is around 11%, with a range of 9.9-20.5%. These threatened species comprise reef-building corals, which are declining due to climate change and ocean acidification; sea birds, whose nesting colonies are threatened by invasive mammals; and fishes, which are impacted primarily by overexploitation and habitat destruction. A further 8% of all assessed species are listed as Near Threatened.

Spatial trends in assessed species richness generally show the highest numbers of species occurring along the coast of Papua New Guinea, the Solomon Islands, New Caledonia and Palau, with richness declining eastward to French Polynesia and the Pitcairn Islands. This follows previously documented trends in marine biodiversity, where diversity decreases with increasing distance from the Coral Triangle. However, the proportion of threatened species shows a different picture, with the highest proportions occurring in offshore waters. This is largely because of the high proportion of pelagic tunas and sharks that are listed as threatened and provides justification for large marine protected areas in the Pacific Ocean.

The threats to Pacific Island marine biodiversity are many. The effects of multiple stressors occurring in concert are likely to be stronger than any single stressor acting in isolation. Although many areas of the Pacific Islands are far from direct human impacts (e.g., exploitation, point-source pollution and habitat destruction), even the most remote islands are experiencing the negative effects of climate change, ocean acidification and airborne pollutants.

Of particular priority for future research are the species assessed as Data Deficient. About 11% of the Pacific Islands' assessed marine biota (304 species) is so limited in available data that the extinction risk could not be evaluated. These were generally species with few verified specimens, taxonomic uncertainties or major threats that could not be quantified.

Results from IUCN Red List initiatives such as this can guide decision-making and conservation prioritization of Pacific Island governments, non-governmental organizations (NGOs) and the private sector. By shaping regional and national policies with these data in mind, priority sites for maintaining marine biodiversity can be identified and conserved.

Commonly-used Abbreviations

Red List Categories

EX	Extinct
EW	Extinct in the Wild
CR	Critically Endangered
EN	Endangered
VU	Vulnerable
NT	Near Threatened
LC	Least Concern
DD	Data Deficient
NE	Not Evaluated

Country Codes

AS	American Samoa
CK	Cook Islands
FJ	Fiji
FM	Federated States of Micronesia
GU	Guam
KI	Kiribati
MH	Marshall Islands
MP	Northern Mariana Islands
NC	New Caledonia
NR	Nauru
NU	Niue
PG	Papua New Guinea
PN	Pitcairn Islands
PF	French Polynesia
PW	Palau
SB	Solomon Islands
TK	Tokelau
TO	Tonga
TV	Tuvalu
VU	Vanuatu
WF	Wallis and Futuna
WS	Samoa

International Organizations

IUCN	International Union for Conservation of Nature
SSC	Species Survival Commission
SSG	Species Specialist Group
RLA	Red List Authority
MBU	Marine Biodiversity Unit
FAO	Food and Agriculture Organization

1. Background

1.1 The Pacific Islands of Oceania

Oceania, defined geopolitically by International Union for Conservation of Nature (IUCN), is spread over 100 million km^2 of the Pacific Ocean. It includes Australia, New Zealand and the 22 countries and territories of the Pacific Islands of Melanesia, Micronesia and Polynesia. Oceania's ecosystems are diverse, ranging from the offshore marine realms, coral reefs, shoreline atolls, mangroves, coastal plains, lowland forests and wetlands of Pacific Island nations, to the mountains, fjords and glaciers of New Zealand and the grasslands and inland deserts of Australia. Oceania is characterized by areas of high species diversity and endemism in both the terrestrial and marine realms (e.g., Worm et al. 2003, Allen 2007, Kier et al. 2009, Pippard 2012).

Within the broad Oceania region, the Pacific Islands of Oceania (Figure 1) face socioeconomic and environmental challenges distinct from those encountered by the more continental Australia and New Zealand. The size and ecological diversity of the Pacific Islands generally decreases from southwest to northeast, tapering from the high, forested islands of Melanesia to scores of tiny, sparsely vegetated atolls scattered across the central and eastern Pacific. Due to the thousands of isolated islands, varying climates and a wide geographic range, these oceanic islands support a great diversity of terrestrial and aquatic habitats and associated species.

The Pacific Islands of Oceania straddle two major lithospheric plates: the Pacific Plate and the Indo-Australian Plate. Associated with these plates are distinct assemblages of many marine fauna, including shorefishes and various invertebrate taxa (Springer 1982, Mundy 2005). Marine taxonomic diversity is highest west of the Pacific Islands, in the Coral Triangle (Malaysia, Indonesia and the Philppines). Diversity declines eastward through the Pacific Islands (e.g., Springer 1982, Carpenter and Springer 2005, Mundy 2005, Allen 2007, Sanciangco et al.

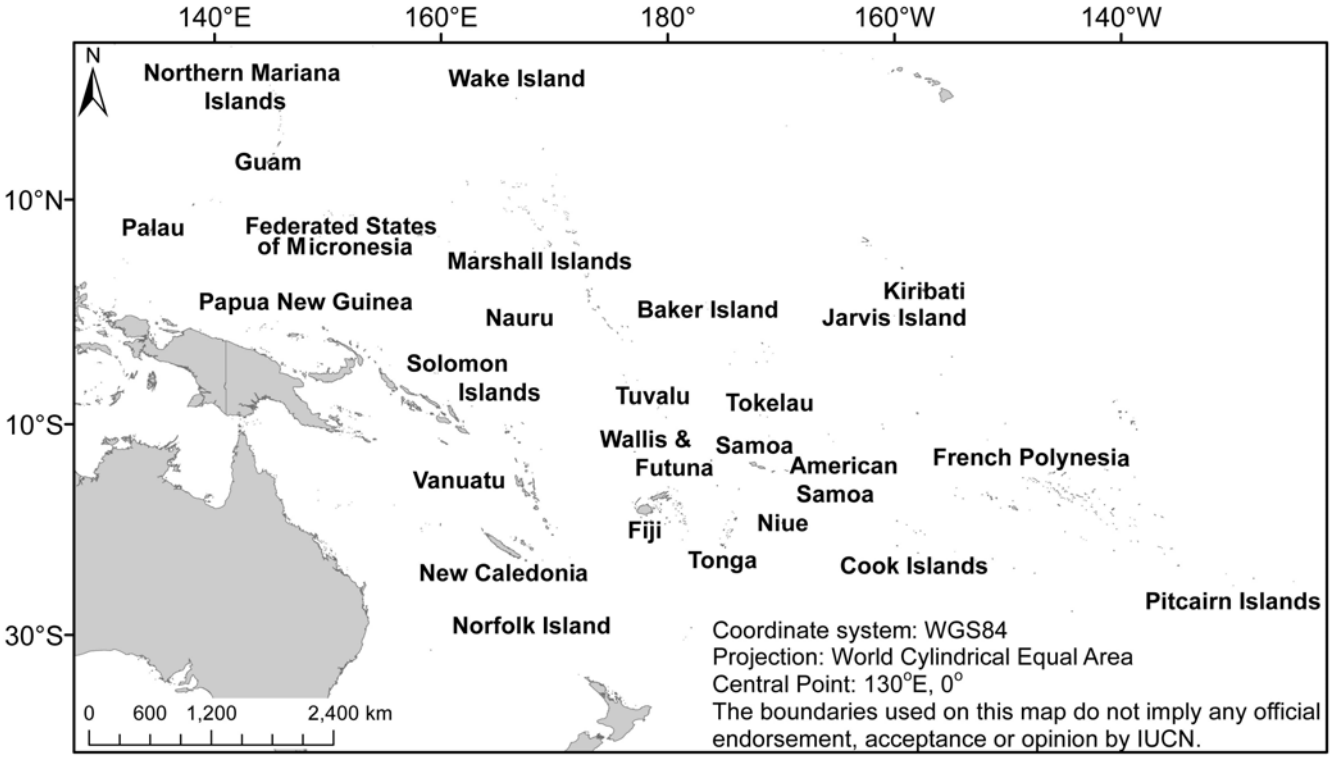


Figure 1: The Pacific Islands of Oceania, including the 22 countries and territories of the Pacific Islands of Melanesia, Micronesia and Polynesia.

2013), such that the western Micronesian islands tend to be more species rich than the isolated islands in the eastern parts of Polynesia.

The often expansive distances between islands increases the risk of local extinctions as migration between populations can be limited. This is especially concerning for restricted range species (Hawkins et al. 2000) and highly specialized species with widespread but clumped distributions (Hobbs et al. 2010). The Pacific Islands region is inherently susceptible to biotic and abiotic stressors, which have a disproportionate effect, relative to continental regions, on the local environment and biodiversity of the region (Blackburn et al. 2004). Situated in the tropical Pacific, strong typhoons that damage entire seascapes, including coral communities and mangrove stands, are common. Typhoon damage also displaces terrestrial resources, further exacerbating the demand island inhabitants place on marine resources.

Economic growth, human dependency on natural resources and an increasing human population of approximately 9 million people (Haberkorn 2008) are placing unsustainable demands on the ecosystems of the Pacific Islands. Terrestrial ecosystems are affected by deforestation, land conversion, and agricultural expansion. Marine ecosystems are affected by coastal modification and development, during which many habitats are degraded, fragmented or destroyed. For example, mangroves, which provide important nursery habitat for many marine species, are harvested for a variety of uses, including fuel and building materials, and are also cleared to make room for development and urban growth (Ellison 2009). Additional impacts of invasive species and climate change are serious threats to many species, especially those that are rare and/or endemic. This loss of biodiversity and ecosystem resiliency affects the people who rely on these species for their livelihoods (Pippard 2012).

The most significant threat to many marine species is over-exploitation. Many Pacific

Moontail bullseye (*Priacanthus hamrur*), assessed as Least Concern. © R. Myers.

Islanders rely heavily on marine resources for protein and income generation. In this region, fish consumption rates are high, about 50 kg annually per person, as compared to about 8 kg for people living in continental countries such as Australia (FAO 1997, Polidoro et al. 2011).

There is, therefore, an urgent need to implement effective conservation measures that safeguard the ecosystems of the Pacific Islands. However, the lack of basic data on species, the prevalence of outdated information and the limited sampling in many areas prevent a comprehensive understanding of the region's biodiversity. Without this baseline data, conservation plans cannot realize their full potential to effectively address species-specific threats (Margules and Pressey 2000, Pippard 2012).

1.2 Diversity and endemism

The Pacific Islands of Oceania are home to an extensive variety of species, many of which are found nowhere else. The total number of species is still unquantified, but likely exceeds 44,000 species (Pippard 2009). Due to the remoteness of many Pacific Islands, scientific sampling effort has been sparse. Thus, it is expected that new species remain to be discovered, particularly in difficult to reach habitats. Range expansions into the Pacific Islands of species known from infrequent records will also likely be documented in the future.

Marine biodiversity is especially poorly known for the majority of plants and invertebrates. Compared to other parts of the world, even data on vertebrates are limited. There are at least 4,155 species of marine vertebrates known from the Pacific Islands, representing 52 orders and 303 families (Table 1). These estimates are heavily driven by the diversity of marine fishes, of which at least 4,000 species in 44 orders and 282 families are known. Globally, 100-150 new species of marine fish are described each year (Eschmeyer et al. 2010), including many from the Pacific Islands. Thus, the total marine vertebrate diversity in the Pacific Islands is likely considerably higher than is currently known. For example, two cryptic species, Pseudogramma galzini and P. paucilepis, were recently described from French Polynesia (Williams and Viviavi 2016).

Table 1: Marine vertebrate diversity in the Pacific Islands, including the number of orders, families and species in each of the four major taxa. Estimates for reptiles, birds and mammals came from the IUCN Red List (IUCN 2016), and estimates for fishes came from FishBase (Froese and Pauly 2016).

Taxa	Orders	Families	Species
Fishes	44	282+	4000+
Reptiles	2	5	44
Birds	4	11	81
Mammals	2	5	30

The distribution of marine species in the Indo-Pacific follows a general trend of decreasing diversity with distance away from the Coral Triangle (e.g., Carpenter and Springer 2005, Allen 2007, Veron et al. 2009, Polidoro et al. 2011). Areas of particularly high national and regional endemism include New Caledonia, Vanuatu and Fiji, which are located where the Pacific and Indo-Australian plates collide.

1.3 Assessment of extinction risk: the IUCN Red List of Threatened Species

The IUCN Red List Categories and Criteria reflect the principles of extinction risk theory (Mace et al. 2008) and are the most widely used and objective system of quantifying extinction risk at the species level across all taxa except microbiota (e.g., Butchart et al. 2005, De Grammont and Cuarón 2006, Hoffman et al. 2008). The Red List method is a standardized protocol for application across the taxonomic spectrum that identifies and reduces uncertainty in the assessment process.

There are nine Red List categories for global assessments (Figure 2): Extinct (EX), Extinct in the Wild (EW), Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient (DD), and Not Evaluated (NE) (IUCN 2001).

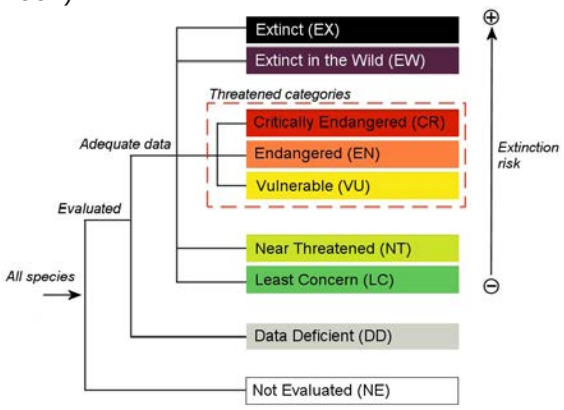


Figure 2: The IUCN Red List Categories.

Species that meet the quantitative thresholds under one or more of the five criteria for are assigned to one of the three threatened categories (CR, EN or VU), depending on the highest threat category for which it qualifies. For species that come very close to, but do not fully meet the thresholds for a threatened category, the Near Threatened category is applied. When there are no known major global-level threats, or the known threats to a species do not reach quantitative thresholds, it is assessed as Least Concern, which is meant to indicate a relatively low current risk for extinction. When assessment data indicate unquantified but known serious threats (i.e., fishing pressure) or that extent of distribution is poorly understood due to taxonomic uncertainty or lack of sampling effort, then the Red List Criteria cannot be applied until further research is conducted, and the species is assigned to the Data Deficient category. The Not

Whale Shark (*Rhincodon typus*), assessed as Endangered. © B. Stockwell

Evaluated category is used to describe a species that is recognized as valid, but that has not yet been assessed against the Red List Criteria (IUCN 2012); these species are not included on the Red List.

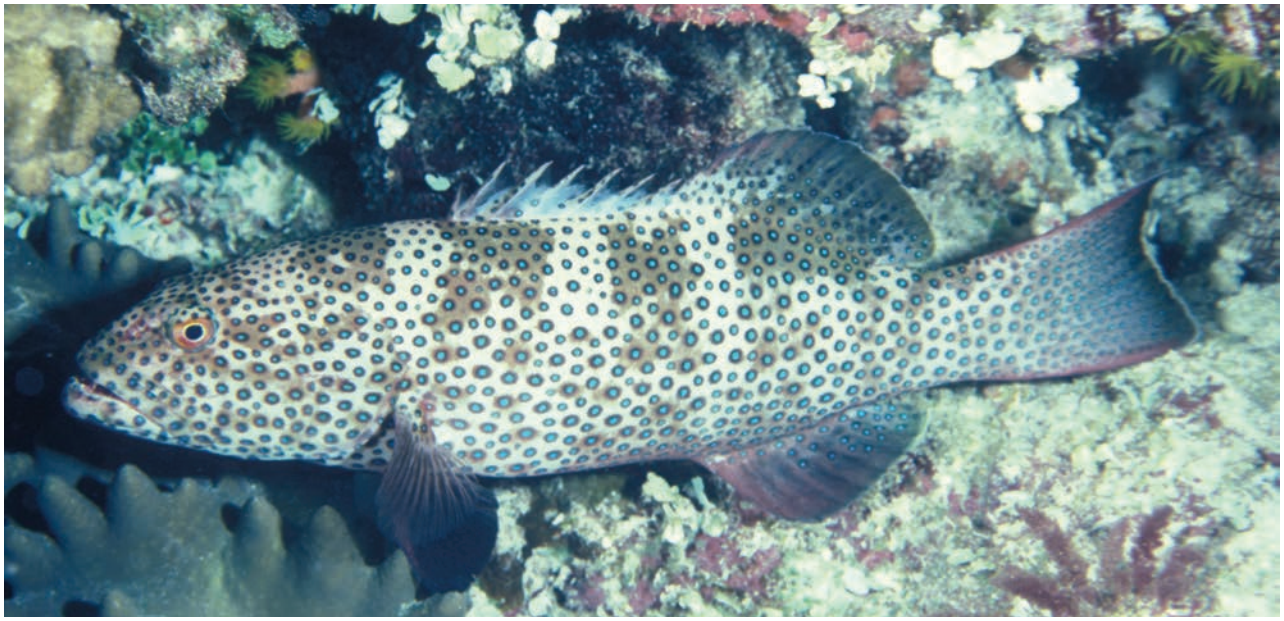
Each of the five Red List Criteria addresses one or both of the two premises of extinction risk theory: elevated risk of extinction occurs when (1) species' populations are small and/or (2) species have experienced, are experiencing or are likely to experience population declines at rates that are biologically unfeasible for the population to remain viable in the wild (Mace et al. 2008). Criterion A is commonly applied to wide-ranging species facing identifiable threat(s) that cause a population reduction beyond a species' ability to naturally sustain itself. The decline is scaled to the life history of the species by the generation length, which is defined as the average age of the parents of a cohort. Criterion B addresses restricted range species that are also characterized by fragmentation, fluctuations, or declines in range, habitat or individuals. Two characteristics can describe the spatial distribution of extinction risk. Extent of Occurrence (EOO) is measured the area of a minimum convex polygon that contains all known or inferred occurrences, and Area of Occupancy (AOO) is the area within the EOO that is actually inhabited by the species. Criterion C is applied to species with a naturally small population size and an observed, inferred or estimated continued decline of the number of mature individuals in a population. Criterion D addresses species with extremely small and/or restricted populations, and Criterion E relies on computer modelled extinction risk probabilities to estimate extinction risk.

1.4 Project Objectives

Coastal overfishing and the loss of inshore marine biodiversity are two of the most serious challenges to conservation in the Pacific Islands. Positive outcomes demonstrated by locally managed marine areas show that there is great scope for conservation to reverse the trend of overfishing and population decline (Govan et al. 2009, SPREP 2016). However, limited information on the distribution and conservation status of marine biodiversity in the Pacific Islands reduces the effectiveness of conservation planning, including resource management (Margules and Pressey 2000, Mikkelsen and Cracraft 2001, Gill and Kemp 2002, Agardy et al. 2011, Pressey et al. 2015).

The 2008 analysis of the IUCN Red List identified major taxonomic and geographical gaps in our knowledge of Pacific Island species, especially for the marine and freshwater environments (Pippard 2009). For example, only about 223 of the more than 4,000 fishes of the Pacific Islands were assessed by 2008 (Pippard 2009). Since then, additional clade-based global initiatives to assess 20,000 marine species has been occurring under the purview of the Marine Biodiversity Unit's (MBU) Global Marine Species Assessment project (Dulvy 2013). As a result, by 2013, the number of marine species of the Pacific Islands on the Red List increased to about 1,900, including habitat-forming plants (seagrasses and mangroves), reef-building corals, cone snails, sea cucumbers, and many higher vertebrates (including marine mammals, sea turtles, sea birds and chondrichthyans).

However, the most diverse group of vertebrates, the bony fishes (class Actinopterygii), still remain under-represented. During a 2011 review of the



Coral Grouper (*Epinephelus corallicola*), assessed as Data Deficient. © J. Randall

state of marine biodiversity in Oceania (Polidoro et al. 2011), only five perciform groups had been completed assessed: the angelfishes (Pomacanthidae), butterflyfishes (Chaetodontidae), groupers (Epinephelidae), parrotfishes (Scaridae and Odacidae) and wrasses (Labridae). Of these 420 species, eight were listed as threatened, primarily due to overfishing. Nearly 10% (42 species), mostly groupers, were listed as Data Deficient since the impact from fishing was likely significant but could not be quantified.

Since this 2011 review, additional clade-based initiatives were completed, adding over 1,000 marine species of the Pacific Islands to the IUCN Red List. However, bony fish species, especially those associated with coral reefs, remain of critical concern due to their high ecological and economic importance to local communities throughout the Pacific Islands.

Therefore, the overall aim of this project was to support conservation and sustainable management of marine biodiversity in the Pacific Islands of Oceania by filling baseline data gaps on distribution, habitat, population size and trends, use and trade and major threats by assessing marine species for inclusion on the IUCN Red List.

Thus, the objectives of this project were as follows:

- Compile and make freely available, comprehensive and peer-reviewed information on the distribution and conservation status of select groups of coral reef fishes in the Pacific Islands of Oceania.
- Record existing conservation actions through species assessments and develop recommendations of further actions that should be taken to assist with conservation planning and management.
- Ensure that the conservation outcomes of this project are maintained over the long-term and can be easily replicated.
- Collate information that will facilitate the biodiversity of the Oceania region being conserved and managed sustainably (e.g. mapping information).
- Provide the basis for safeguarding the food security and livelihoods of people who rely on biodiversity by compiling information on species and habitats.

2. Assessment Methodology

2.1 Geographic Scope

For this Red List initiative, the Pacific Islands of Oceania region was delineated geopolitically, following the definition used by IUCN's Oceania Regional Office. Therefore, it included all of Micronesia (Palau to Wake Island and Kiribati), Polynesia (except for New Zealand and Hawaii), the Melanesian island chain (Papua New Guinea to New Caledonia and Fiji), and Norfolk Island (Figure 1).

Global level assessments were conducted for species occurring in the following Pacific Island countries and territories: American Samoa, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, Niue, Northern Mariana Islands, New Caledonia, Norfolk Island, Palau, Papua New Guinea, Pitcairn Islands, Samoa, Solomon Islands, Tonga, Tokelau, Tuvalu, Vanuatu, Wallis and Futuna, and the outlying islands and territories of the United States (Wake Island, Baker Island and Jarvis Island).

A species was determined to occur in the Pacific Islands region if its range overlapped with any part of the described study area and there existed documented occurrences of the species' presence in the region. Regionally endemic species are those that are known only from the Pacific Islands. Nationally endemic species occur in only a single country.

2.2 Taxonomic scope

This project is a major expansion in the coverage of marine biodiversity of the Pacific Islands on the IUCN Red List after the 2009 and 2011 publications (Pippard 2009, Polidoro et al. 2011). Since then, an additional 1,050 marine species were assessed as part of previous clade-based assessment initiatives. The most recent Pacific Islands Red List initiative focused on coral reef associated bony fishes. These species play significant ecological roles and many provide key livelihoods to local fishers and island inhabitants. Red List assessments of these fishes are an important next step in documenting the threat status of biodiversity in the Pacific Islands. The results will help direct subsequent conservation actions to areas where they will be most effective and to the species facing the highest levels of threats and extinction risk.

Grey Reef Shark (*Carcharhinus amblyrhynchos*), assessed as Near Threatened. Photo by K. Pollock, U.S. Fish and Wildlife Service.

The analyses in this report reflect 2,856 valid marine species in the following taxonomic and functional groups:

- habitat-forming plants (seagrasses and mangroves)
- reef-building corals
- exploited invertebrates (cone snails and sea cucumbers)
- marine mammals
- sea turtles
- sea birds
- chondrichthyans (sharks, rays and chimaeras)
- hagfishes
- select bony fishes.

Within these taxonomic groups, only valid species that are primarily marine, native and present in the Pacific Islands (as defined herein), and published on the IUCN Red List as of December 2016 were included. Taxa below the species level (i.e., subspecies) were excluded.

Approximately 170 species incorrectly identified as occurring in the Pacific Islands or only occasionally found in the marine environment were excluded.

Taxonomy follows the standards adopted by the IUCN Species Survival Commission (SSC) Species Specialist Groups (SSGs) and Red List Authorities (RLAs) responsible for the specific taxonomic group. Higher taxonomic levels for the bony fishes primarily follow that set forth by Nelson (2006), and species-level taxonomy follows that set forth by Eschmeyer et al. (2016) in the California Academy of Science's online Catalog of Fishes. It is expected that the vast majority of Pacific Island species in these taxonomic and functional groups have been included in this analysis; however, species described or with range expansions into the Pacific Islands after the clade-based initiative was completed may have been omitted.

The selection of marine bony fishes for this analysis was based on the status of the on-going clade based initiative. Prior to 2015, 16 bony fish clades were fully assessed and published on the IUCN Red List website (Table 2). As few coral-reef associated species were included, the most recent assessments focused on 866 species in coral-associated families (Appendix I).

2.3 Preliminary assessments and pre-workshop data collection

The IUCN Red List methodology is an objective, data-driven process based on extinction risk theory. For each species, the respective IUCN species authority (e.g., Species Specialist Group, Red List Authority, Marine Biodiversity Unit) led the assessment process (Table 3). All species-specific information was complied into IUCN's Species Infomrmation Service (SIS) database, including data on the taxonomic classification, geographic distribution, population status and trends, habitats and ecology, threats and conservation measures.

Table 2: Higher taxonomy and number of Pacific Islands' species in the marine bony fish clades included as part of a global initiative to assess all marine bony fishes against the IUCN Red List Categories and Criteria.

Order	Family	Species
Albuliformes	Albulidae	2
Elopiformes	Elopidae	1
Elopiformes	Megalopidae	1
Perciformes	Acanthuridae	55
Perciformes	Blenniidae	140
Perciformes	Chaetodontidae	61
Perciformes	Clinidae	1
Perciformes	Epinephelidae	69
Perciformes	Istiophoridae	5
Perciformes	Labridae	249
Perciformes	Pomacanthidae	38
Perciformes	Sparidae	5
Perciformes	Tripterygiidae	49
Perciformes	Xiphiidae	1
Tetraodontiformes	Tetraodontidae	49
Myxiniformes	Myxinidae	3

The draft species accounts in SIS and the digital, generalized distribution maps were made available to the experts prior to the workshops in order to ensure that the most up-to-date and scientifically correct data are used in the species' assessments.

2.4 IUCN Red List assessment workshops

The species included in this analysis were assessed during approximately 26 global, clade-based Red List assessment workshops involving hundreds of taxonomic experts from around the world. Two additional workshops were held in Fiji in 2015 to assess specific coral-associated bony fish families. Eighteen regional and international experts in coral-associated fish taxonomy, biology and conservation (Appendix II) attended these two workshops with facilitation by MBU and IUCN-Oceania staff.

Table 3: IUCN groups responsible for the global initiatives to assess marine species included in this analysis. MBU – Marine Biodiversity Unit; SG – Specialist Group; RLA – Red List Authority.

Kingdom	Phylum	Class	Group	IUCN Lead
Plantae	Angiospermae	Monocotyledons	Seagrasses	MBU
Plantae	Magnoliophyta	Magnoliopsida	Mangroves	MBU
Animalia	Cnidaria	Anthozoa	Corals	MBU
Animalia	Mollusca	Gastropoda	Cone snails	MBU
Animalia	Echinodermata	Holothuroidea	Sea cucumbers	MBU
Animalia	Chordata	Chondrichthyes	Chimaeras	Shark SG
Animalia	Chordata	Chondrichthyes	Batoids	Shark SG
Animalia	Chordata	Chondrichthyes	Sharks	Shark SG
Animalia	Chordata	Actinopterygii	Bony fishes	MBU; Marine Fishes RLA
Animalia	Chordata	Actinopterygii	Groupers	Grouper and Wrasse SG
Animalia	Chordata	Myxini	Hagfishes	MBU; Marine Fishes RLA
Animalia	Chordata	Actinopterygii	Wrasses	Grouper and Wrasse SG
Animalia	Chordata	Reptilia	Sea snakes	MBU
Animalia	Chordata	Reptilia	Sea turtles	Marine Turtle SG
Animalia	Chordata	Aves	Sea birds	BirdLife (Bird Red List Authority)
Animalia	Chordata	Mammalia	Marine mammals	Cetacean SG; Sirenia SG

The first day of the workshop consisted of an overview of the project's aim and scope, as well as a short training in the use and application of IUCN Red List methodology and Criteria. During the remainder of the workshop, experts were separated into groups based on their taxonomic expertise. Guided by one of the facilitators, the experts reviewed the preliminary assessments generated during pre-workshop data collection efforts, and contributed additional species-specific information as available. These data were then used to determine if the thresholds and subcriteria were met for a threatened listing under at least one Red List criterion for each species.

2.5 Post-workshop editing

Following the workshops, each species' assessment was edited and outstanding questions resolved through further consultations with the workshop participants, as well as with members of the relevant Species Specialist Groups who did not attend the workshops. When necessary, distribution maps were also revised to more accurately reflect the known distribution of each species.

During this process, consistency in the application of the Red List categories and criteria was first checked by staff at the MBU. Each assessment was then evaluated by reviewers with Red List expertise who were not part of the assessment process. A final review and consistency check was completed by the IUCN Red List Unit, the division of the IUCN Global Species Programme responsible for maintaining the Red List website. The resulting final IUCN Red List assessments are a product of scientific consensus and exchange among numerous experts, and are backed by relevant literature and data sources. All species assessments were published on the IUCN Red List website (www.iucnredlist.org) by December 2016.

2.6 Methodology for spatial analyses

Following the documented Red List mapping protocols (IUCN 2012), expert-vetted and reliable point records, as well as scientific literature and data on depth and habitat preferences, were used to generate distribution maps in ArcGIS 10.1. For purposes of Red List assessments, coastal species are understood as species residing near the shore in depths shallower than

200 m. Maps for coastal species were clipped to a buffered bathymetric layer, based on two-minute spatial bathymetry data made available by the National Marine Fisheries Service of the U.S. National Oceanographic and Atmospheric Administration (Amante and Eakins 2009). The buffer was either 100 km from the coast or the 200 m depth contour, whichever was further from the coastline. This approach standardizes the way coastal fish species are mapped and produces uniform and comparable distribution maps. For pelagic and/or deep sea species, distribution maps were digitized by hand relative to known depth preferences and habitat requirements.

Species richness analyses were conducted to evaluate biodiversity patterns in the Pacific Islands region for: 1) all assessed marine species; 2) only habitat-forming species (reef-building corals, seagrasses and mangroves); and all assessed marine fishes (classes Myxini, Chondrichthyes and Actinopterygii). Additional spatial patterns in marine fish diversity were also evaluated, including: 1) marine fishes assessed as threatened (i.e., CR, EN or VU); 2) marine fishes assessed as Data Deficient; and 3) proportion of threatened marine fishes, calculated as: (CR+EN+VU)/(total assessed-DD). This represents the midpoint, or best estimate, for the proportion of threatened species in each cell.

For all richness analyses, each species' distribution map was transformed into the World Cylindrical Equal Area Coordinate system and converted into a square grid raster of 10 x 10 km cell size. Each cell which the species polygon overlapped was assigned a value of "1". For each richness analysis, the selected rasters were added together so that the cells of the final raster represented the number of species that occupy each grid cell within the region.

Fourspot butterflyfish (*Chaetodon quadrimaculatus*), assessed as Least Concern. Photo by A. Wegmann, U.S. Fish and Wildlife Service.

3. The Status and Distribution of Marine Biodiversity of the Pacific Islands

3.1 Geographic Scope

Approximately 10%, or 281, of the 2,856 assessed marine species of the Pacific Islands are listed as threatened. When accounting for the uncertainty surrounding the true status of the species listed as Data Deficient, the midpoint is estimated at 11%. The true percentage of threatened species may be 9.8%, if none of the Data Deficient species are threatened, to 20.5%, if all of the Data Deficient species are threatened (Table 4).

Table 4: Range of percentage of threatened marine species in the Pacific Islands of Oceania, using the estimators recommended in IUCN (2011).

Parameter	Equation	Estimate
Lower Bound	(CR+EN+VU)/ Assessed	9.8%
Midpoint	(CR+EN+VU)/ (Assessed-DD)	11.0%
Upper Bound	(CR+EN+VU+DD)/ Assessed	20.5%

About one-third of the threatened species are vertebrates, including 41 chondrichthyan fishes, 21 bony fishes, 24 sea birds, 7 marine reptiles and 5 marine mammals (Table 5). The remaining 183 species are plants and invertebrates, the vast majority of which (171 species) are reef-building corals (Appendix III).

The majority of species were listed as threatened under one criterion, with just six species listed under multiple criteria. About 86% of the threatened species (242 species) were listed as threatened on the basis of estimated population declines under criterion A. For example, the Harlequin filefish (*Oxymonacanthus longirostris*) is an obligate acroporid corallivore. It was assessed as Vulnerable, based on localized extinctions and projected future population declines that are expected to occur as acroporid corals continue to decline. Eleven species were listed under criterion B (small geographic range), five under criterion C (small population size and decline) and 17 under criterion D (very small population size). The Fiji Petrel (*Pseudobulweria macgillivrayi*) was one of the few species assessed under two criteria; it was listed as Critically Endangered under criteria C and D based on population size estimates.

Staghorn Coral (*Acropora formosa*), assessed as Near Threatened. Photo by A. Meyer, U.S. Fish and Wildlife Service.

Table 5: Pacific Island marine vertebrates assessed as threatened (Critically Endangered - CR, Endangered - EN, or Vulnerable - VU). Cat – Red List Category and Crit – the associated Red List Criteria.

Order	Family	Species	Cat	Crit
Rajiformes	Pristidae	*Pristis microdon*	CR	A2cd
Rajiformes	Pristidae	*Pristis pristis*	CR	A2cd
Rajiformes	Pristidae	*Pristis zijsron*	CR	A2cd
Carcharhiniformes	Carcharhinidae	*Carcharhinus hemiodon*	CR	A2acd; C2a(i)
Perciformes	Gobiidae	*Akihito futuna*	CR	B1ab(ii,iii)
Testudines	Cheloniidae	*Eretmochelys imbricata*	CR	A2bd
Procellariiformes	Procellariidae	*Pseudobulweria becki*	CR	C2a(ii)
Procellariiformes	Procellariidae	*Pseudobulweria macgillivrayi*	CR	C2a(i,ii);D
Rajiformes	Myliobatidae	*Aetomylaeus maculatus*	EN	A2d+3d+4d
Rajiformes	Myliobatidae	*Aetomylaeus vespertilio*	EN	A2d
Rajiformes	Pristidae	*Anoxypristis cuspidata*	EN	A2cd
Rajiformes	Pristidae	*Pristis clavata*	EN	A2cd
Carcharhiniformes	Carcharhinidae	*Glyphis glyphis*	EN	C2a(i)
Carcharhiniformes	Sphyrnidae	*Sphyrna lewini*	EN	A2bd+4bd
Carcharhiniformes	Sphyrnidae	*Sphyrna mokarran*	EN	A2bd+4bd
Squaliformes	Centrophoridae	*Centrophorus harrissoni*	EN	A2bd
Perciformes	Gobiidae	*Sicyopterus eudentatus*	EN	B1ab(ii,iii,iv)
Perciformes	Labridae	*Cheilinus undulatus*	EN	A2bd+3bd
Perciformes	Pomacanthidae	*Chaetodontoplus vanderloosi*	EN	B1ab(v)+2ab(v)
Tetraodontiformes	Tetraodontidae	*Canthigaster rapaensis*	EN	B2ab(iii)
Testudines	Cheloniidae	*Chelonia mydas*	EN	A2bd
Procellariiformes	Oceanitidae	*Nesofregetta fuliginosa*	EN	C2a(i)
Procellariiformes	Procellariidae	*Pterodroma alba*	EN	A3bce+4bce
Procellariiformes	Procellariidae	*Pterodroma atrata*	EN	B2ab(v)
Procellariiformes	Procellariidae	*Puffinus newelli*	EN	A2bce+3bce+4bce
Procellariiformes	Diomedeidae	*Thalassarche carteri*	EN	A4bde
Cetartiodactyla	Balaenopteridae	*Balaenoptera borealis*	EN	A1ad
Cetartiodactyla	Balaenopteridae	*Balaenoptera musculus*	EN	A1abd
Cetartiodactyla	Balaenopteridae	*Balaenoptera physalus*	EN	A1d
Rajiformes	Dasyatidae	*Dasyatis fluviorum*	VU	A2bcd+3cd+4bcd
Rajiformes	Dasyatidae	*Himantura leoparda*	VU	A2cd+3cd+4cd
Rajiformes	Dasyatidae	*Himantura uarnak*	VU	A2bd+3bd+4bd
Rajiformes	Dasyatidae	*Taeniurops meyeni*	VU	A2d
Rajiformes	Dasyatidae	*Urogymnus asperrimus*	VU	A2bd
Rajiformes	Mobulidae	*Manta alfredi*	VU	A2abd+3bd+4abd
Rajiformes	Mobulidae	*Manta birostris*	VU	A2abd+3bd+4abd
Rajiformes	Myliobatidae	*Aetomylaeus nichofii*	VU	A2d+3d+4d
Rajiformes	Rhinidae	*Rhina ancylostoma*	VU	A2bd+3bd+4bd
Rajiformes	Rhinobatidae	*Glaucostegus granulatus*	VU	A2bd+3d+4d
Rajiformes	Rhinobatidae	*Glaucostegus thouin*	VU	A2abd+3bd+4abd
Rajiformes	Rhinobatidae	*Glaucostegus typus*	VU	A2bd+3bd+4bd
Carcharhiniformes	Carcharhinidae	*Carcharhinus longimanus*	VU	A2ad+3d+4ad
Carcharhiniformes	Carcharhinidae	*Carcharhinus obscurus*	VU	A2bd
Carcharhiniformes	Carcharhinidae	*Carcharhinus plumbeus*	VU	A2bd+4bd
Carcharhiniformes	Carcharhinidae	*Negaprion acutidens*	VU	A2abcd+3bcd+4abcd
Carcharhiniformes	Scyliorhinidae	*Aulohalaelurus kanakorum*	VU	B1ab(iii)
Lamniformes	Alopiidae	*Alopias pelagicus*	VU	A2d+4d
Lamniformes	Alopiidae	*Alopias superciliosus*	VU	A2bd
Lamniformes	Alopiidae	*Alopias vulpinus*	VU	A2bd+3bd+4bd

Order	Family	Species	Cat	Crit
Lamniformes	Lamnidae	*Carcharodon carcharias*	VU	A2cd+3cd
Lamniformes	Lamnidae	*Isurus oxyrinchus*	VU	A2abd+3bd+4abd
Lamniformes	Lamnidae	*Isurus paucus*	VU	A2bd+3d+4bd
Lamniformes	Odontaspididae	*Odontaspis ferox*	VU	A2bd
Orectolobiformes	Ginglymostomatidae	*Nebrius ferrugineus*	VU	A2abcd+3cd+4abcd
Orectolobiformes	Hemiscylliidae	*Hemiscyllium hallstromi*	VU	B1ab(iii)
Orectolobiformes	Hemiscylliidae	*Hemiscyllium strahani*	VU	B1ab(iii)
Orectolobiformes	Rhincodontidae	*Rhincodon typus*	VU	A2bd+3d
Orectolobiformes	Stegostomidae	*Stegostoma fasciatum*	VU	A2abcd+3cd+4abcd
Albuliformes	Albulidae	*Albula glossodonta*	VU	A2bcd
Perciformes	Acanthuridae	*Acanthurus chronixis*	VU	D2
Perciformes	Blenniidae	*Medusablennius chani*	VU	D2
Perciformes	Blenniidae	*Parablennius serratolineatus*	VU	D2
Perciformes	Epinephelidae	*Cromileptes altivelis*	VU	A4cd
Perciformes	Epinephelidae	*Epinephelus lanceolatus*	VU	A2d
Perciformes	Epinephelidae	*Plectropomus areolatus*	VU	A4d
Perciformes	Epinephelidae	*Plectropomus laevis*	VU	A2d+4d
Perciformes	Istiophoridae	*Makaira nigricans*	VU	A2bd
Perciformes	Labridae	*Bolbometopon muricatum*	VU	A2d
Perciformes	Labridae	*Coris bulbifrons*	VU	B2ab(ii,v)
Perciformes	Scombridae	*Thunnus obesus*	VU	A2bd
Perciformes	Scombridae	*Thunnus orientalis*	VU	A2bd
Perciformes	Siganidae	*Siganus niger*	VU	A?
Tetraodontiformes	Tetraodontidae	*Canthigaster marquesensis*	VU	B1ab(iii)+2ab(iii)
Tetraodontiformes	Monacanthidae	*Oxymonacanthus longirostris*	VU	A3c
Testudines	Cheloniidae	*Caretta caretta*	VU	A2b
Testudines	Dermochelyidae	*Dermochelys coriacea*	VU	A2bd
Testudines	Cheloniidae	*Lepidochelys olivacea*	VU	A2bd
Squamata	Elapidae	*Laticauda crockeri*	VU	D2
Squamata	Elapidae	*Laticauda schistorhynchus*	VU	B1ab(iii); D2
Procellariiformes	Procellariidae	*Ardenna bulleri*	VU	D2
Procellariiformes	Diomedeidae	*Diomedea antipodensis*	VU	D2
Procellariiformes	Diomedeidae	*Diomedea exulans*	VU	A4bd
Procellariiformes	Hydrobatidae	*Hydrobates matsudairae*	VU	D2
Procellariiformes	Procellariidae	*Procellaria parkinsoni*	VU	D2
Procellariiformes	Procellariidae	*Pterodroma brevipes*	VU	C2a(i);D1
Procellariiformes	Procellariidae	*Pterodroma cervicalis*	VU	D2
Procellariiformes	Procellariidae	*Pterodroma cookii*	VU	A2e;D2
Procellariiformes	Procellariidae	*Pterodroma externa*	VU	D2
Procellariiformes	Procellariidae	*Pterodroma leucoptera*	VU	B2ab(v);D2
Procellariiformes	Procellariidae	*Pterodroma longirostris*	VU	D2
Procellariiformes	Procellariidae	*Pterodroma pycrofti*	VU	D2
Procellariiformes	Procellariidae	*Pterodroma solandri*	VU	D2
Procellariiformes	Procellariidae	*Puffinus heinrothi*	VU	D1+2
Procellariiformes	Diomedeidae	*Thalassarche eremita*	VU	D2
Procellariiformes	Diomedeidae	*Thalassarche impavida*	VU	D2
Charadriiformes	Laridae	*Sternula nereis*	VU	C1
Sirenia	Dugongidae	*Dugong dugon*	VU	A2bcd+4bcd
Cetartiodactyla	Physeteridae	*Physeter macrocephalus*	VU	A1d

For the 222 species listed as Near Threatened, the majority (153, about 70%) are hard corals in the class Anthozoa. These species are under threat from climate change, ocean acidification, harvesting for the aquarium and curio trade, and storm damage. Current and projected population declines approach, but do not quite meet, the thresholds and subcriteria for a threatened listing at this time.

The majority of assessed species (2,049 species, representing about 72%) are listed as Least Concern (Figure 3). Generally, these species are widely distributed with no known major threats causing population declines, and thus have a lower risk of extinction. For example, all 14 species of seagrasses were listed as Least Concern because, although some population declines have been documented, these species are widely distributed and globally are not declining sufficiently to qualify for a threatened listing at this time (e.g., Short et al. 2011).

Extinction risk could not be evaluated for 304 species (about 11%), resulting in a categorization of Data Deficient. Some of these species are only known from a single or very few specimens, with little information available on their population or ecology. For example, the snapper *Paracaesio paragrapsimodon* is known only from two type specimens taken off Pohnpei, Caroline Islands (Anderson et al. 1992). Other species (e.g., the goby *Awaous melanocephalus*) have taxonomic issues that obscure the true geographic distribution or population trends.

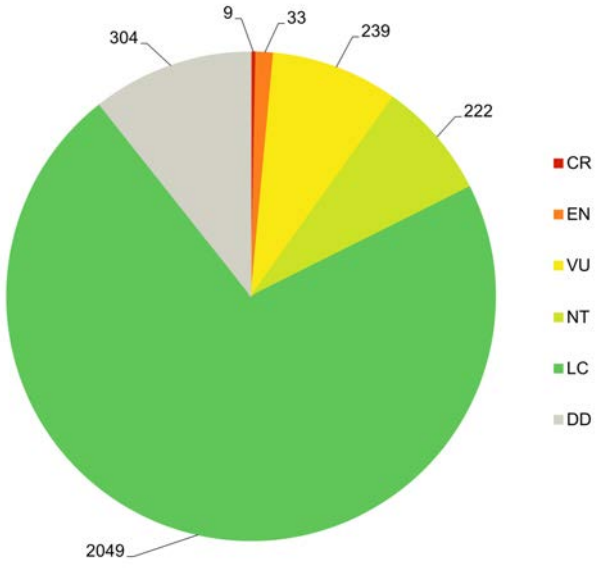


Figure 3: Number of assessed Pacific Island marine species in each of the IUCN Red List Categories: CR – Critically Endangered; EN – Endangered; VU – Vulnerable; NT – Near Threatened; LC – Least Concern; DD – Data Deficient.

White-bottomed Sea Cucumber (*Actinopyga lecanora*), assessed as Data Deficient. © P. Randall

Of particular interest is the high proportion of sea cucumbers (class Holothuroidea) assessed as Data Deficient. Many of these species are known from limited numbers of specimens. Others, such as the White-bottomed Sea Cucumber (*Actinopyga lecanora*) are widely distributed and heavily exploited. These species are listed as Data Deficient population declines due to exploitation are suspected, but could not be quantified. These Data Deficient species have been highlighted as a priority for future research, including on taxonomy, basic life history and the effects of exploitation (Purcell et al. 2014).

3.2 Trends by taxonomic group

The assessed marine biodiversity of the Pacific Islands represents 13 classes and 45 orders, with eight orders composed of only one species in the Pacific Islands (Table 6). The majority of assessed species (2,121, or 75%) are in only three orders (Neogastropoda, Scleractinia and Perciformes). However, the bony fishes (class Actinopterygii) have not yet been completely assessed as a clade, and at least 2,000 more species in these orders occur in the Pacific Islands.

Convict Surgeonfish (*Acanthurus triostegus*), assessed as Least Concern. © D. Clark, U.S. Fish and Wildlife Service.

The conservation status varies substantially by taxonomic group (Figure 4; Table 6). All species in some taxonomic groups (e.g., palms, seagrasses and ferns) were listed as Least Concern. For other taxonomic groups (cone snails, hagfishes and chimaeras), all species were listed as Least Concern or Data Deficient. In contrast, all five species of sea turtles were listed in one of the three threatened categories.

Among the remaining taxonomic groups, the best estimate (midpoint) for the percent of threatened species ranged from 1.4 to 51%. Many vertebrate taxa (e.g., sharks, rays, sea turtles, sea birds and marine mammals), corals and sea cucumbers have a high proportion of threatened species.

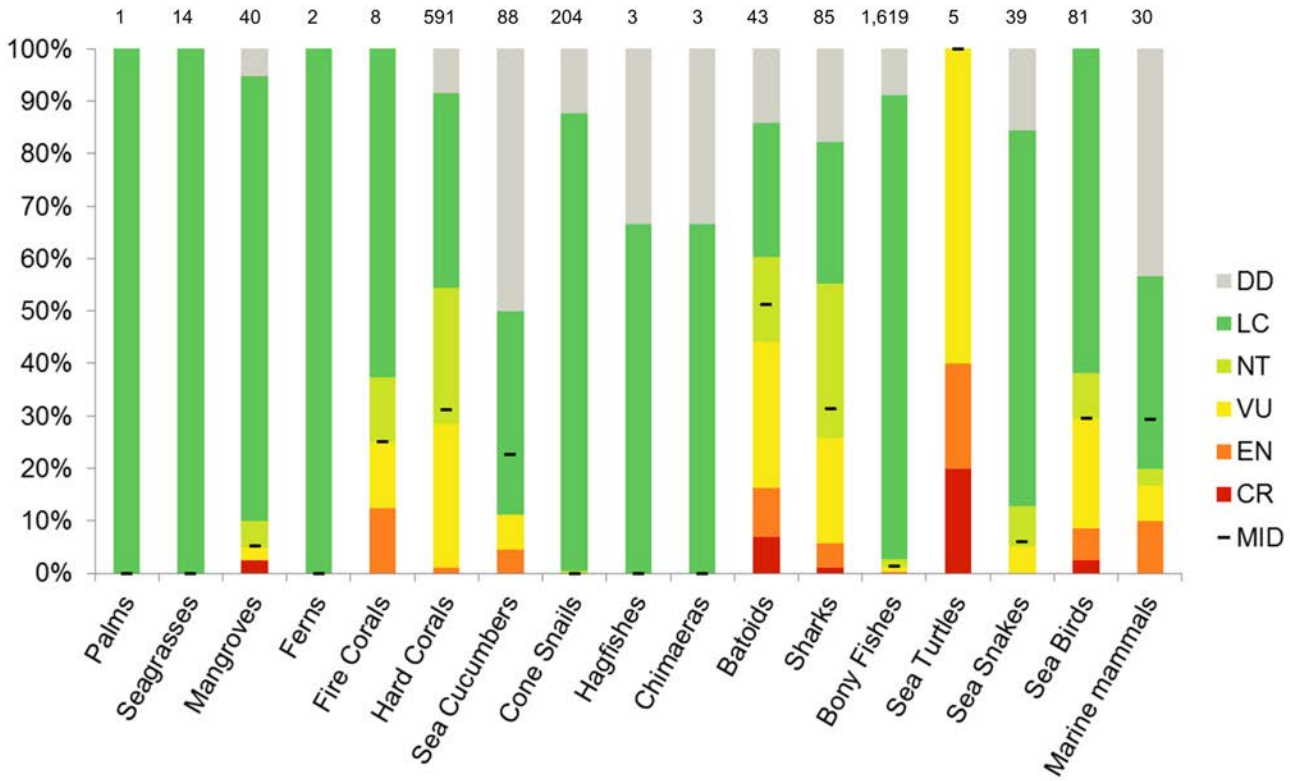


Figure 4: Percentage of Pacific Islands' marine species in each taxonomic group by Red List category: CR – Critically Endangered; EN – Endangered; VU – Vulnerable; NT – Near Threatened; LC – Least Concern; DD – Data Deficient. The number of species in each taxonomic group is provided above the bars. The midpoint, which is indicated by black dashes, represents the best estimate for the percent threatened in each taxonomic group, and was calculated as: (CR+EN+VU)/(total assessed - DD).

Table 6: Number of species assessed in each of the IUCN Red List Categories, by taxonomic group.

Classification	Taxa	Class	CR	EN	VU	NT	LC	DD	Total
Habitat Forming Species	Palms	Liliopsida	0	0	0	0	1	0	1
Habitat Forming Species	Seagrasses	Liliopsida	0	0	0	0	14	0	14
Habitat Forming Species	Mangroves	Magnoliopsida	1	0	1	2	34	2	40
Habitat Forming Species	Ferns	Polypodiopsida	0	0	0	0	2	0	2
Habitat Forming Species	Fire Corals	Hydrozoa	0	1	1	1	5	0	8
Habitat Forming Species	Hard Corals	Anthozoa	0	7	162	153	220	49	591
Invertebrates	Sea Cucumbers	Holothuroidea	0	4	6	0	34	44	88
Invertebrates	Cone Snails	Gastropoda	0	0	0	1	178	25	204
Craniates	Hagfishes	Myxini	0	0	0	0	2	1	3
Vertebrates	Chimaeras	Chondrichthyes	0	0	0	0	2	1	3
Vertebrates	Batoids	Chondrichthyes	3	4	12	7	11	6	43
Vertebrates	Sharks	Chondrichthyes	1	4	17	25	23	15	85
Vertebrates	Bony Fishes	Actinopterygii	1	4	16	22	1434	142	1619
Vertebrates	Sea Turtles	Reptilia	1	1	3	0	0	0	5
Vertebrates	Sea Snakes	Reptilia	0	0	2	3	28	6	39
Vertebrates	Sea Birds	Aves	2	5	17	7	50	0	81
Vertebrates	Marine mammals	Mammalia	0	3	2	1	11	13	30

At a higher-level, functional perspective, the extinction risk of fishes and benthic invertebrates is lower relative to habitat-forming species and higher vertebrates (Table 7).

The most uncertainty in the range of proportion of threatened species occurs within the benthic invertebrates, including the cone snails and sea cucumbers. Within these two groups, nearly 25% of species were assessed as Data Deficient (69 species). Some of these species have not been seen in decades; for example, the predatory Mud Cone (*Conus luteus*) from the Tuamoto Islands in French Polynesia has not been collected in more than 40 years (Kohn et al. 2013, Peters et al. 2013).

Table 7: Range of percentage of threatened marine species in the Pacific Islands of Oceania, using the estimators recommended in IUCN (2011) by functional groups. Species included in the different functional groups are as follows: habitat-forming species – seagrasses, mangroves and reef-building corals (classes Liliopsida, Magnoliopsida, Polypodiopsida, Hydrozoa and Anthozoa); benthic invertebrates – cone snails and sea cucumbers (genus Conus in the class Gastropoda and class Holothuroidea); fishes – hagfishes, bony fishes and cartilaginous fishes (classes Myxini, Chondrichthyes and Actinopterygii); higher vertebrates – sea turtles, sea snakes, sea birds and marine mammals (classes Reptilia, Aves and Mammalia).

Parameter	Equation	Habitat-forming	Benthic Invertebrates	Fishes	Higher Vertebrates
Lower Bound	(CR+EN+VU)/Assessed	26.4%	2.0%	3.5%	23.2%
Midpoint	(CR+EN+VU)/(Assessed-DD)	28.6%	2.7%	3.9%	26.5%
Upper Bound	(CR+EN+VU+DD)/Assessed	34.1%	25.7%	12.9%	35.5%

3.3 Spatial distribution of species

Richness of assessed marine species

Marine biodiversity in the Indo-West Pacific is highest in the Coral Triangle (Malaysia, Indonesia and the Philippines), with species richness decreasing eastwards through the Pacific Islands of Oceania (Carpenter and Springer 2005, Allen 2007, Sanciangco et al. 2013). The spatial distribution of the 2,856 currently assessed marine species in the Pacific Islands follows this general trend (Figure 5), with declining species richness west to east within the region. The highest diversity, up to 1,712 species per 100 km^2 cell, occurs nearest to the Coral Triangle, specifically along the coasts of Papua New Guinea, the Solomon Islands and New Caledonia. Biodiversity is lowest, less than 328 species per 100 km^2 cell, in the offshore waters between the islands and archipelagos.

Richness of habitat-forming species

We included 656 habitat-forming species, including seagrasses, mangroves and reef-building corals. Although palms and ferns are often not considered truly marine, three species (Golden Leather Fern, *Acrostichum aureum*; Mangrove Fern, *Acrostichum speciosum*; and Mangrove Palm, *Nypa fruticans*), are found in coastal and estuarine areas of the Pacific Islands, and thus were included in this analysis.

As would be expected given the biodiversity patterns of the three major taxa included (Carpenter et al. 2008, Polidoro et al. 2010, Short et al. 2011), the richness is highest along the coasts of Papua New Guinea and the Solomon Islands, and decreases east to French Polynesia and the Pitcairn Islands (Figure 6). The richness of habitat-forming species in the western part of the Federated States of Micronesia (i.e., near Yap), about 225-250 species per 100 km^2, is lower than neighboring Palau and the rest of the Federated States of Micronesia, with more than 370 species per 100 km^2. This difference may be due to the slightly higher latitude and likely cooler waters, limiting the richness of the tropical reef-building corals found further south.

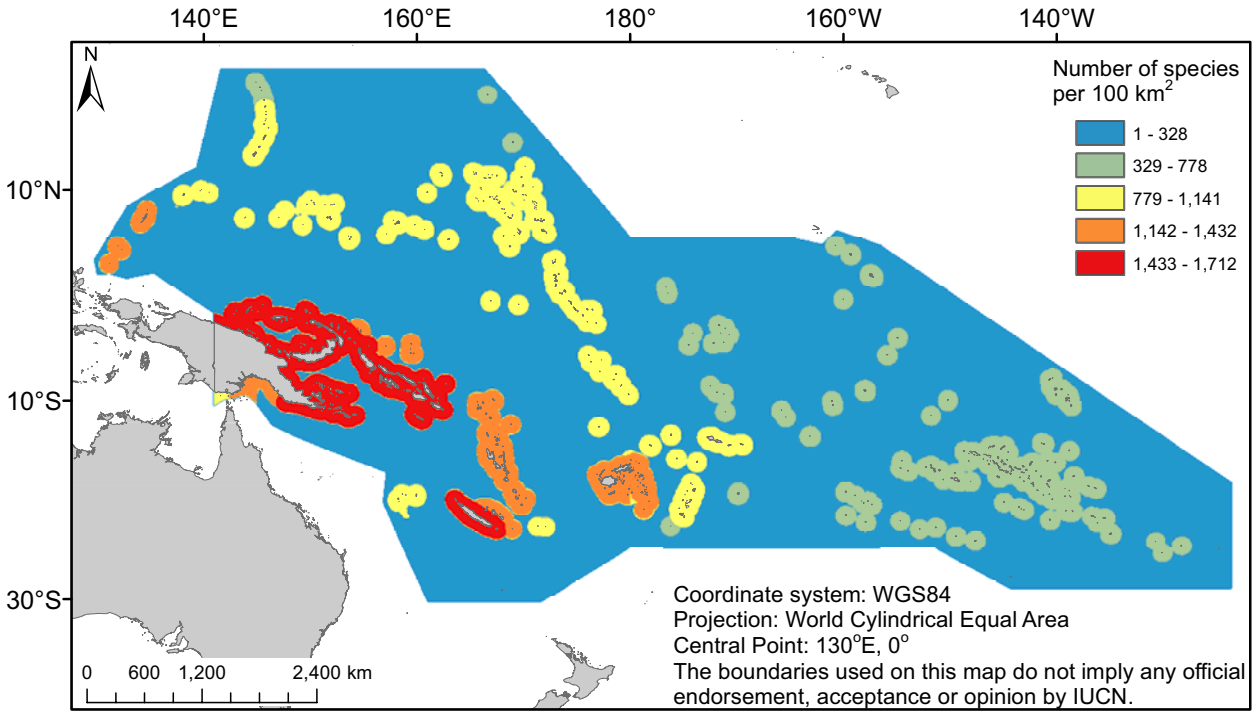


Figure 5: Distribution of the 2,856 marine species in the Pacific Islands of Oceania that have been assessed against the IUCN Red List Categories and Criteria.

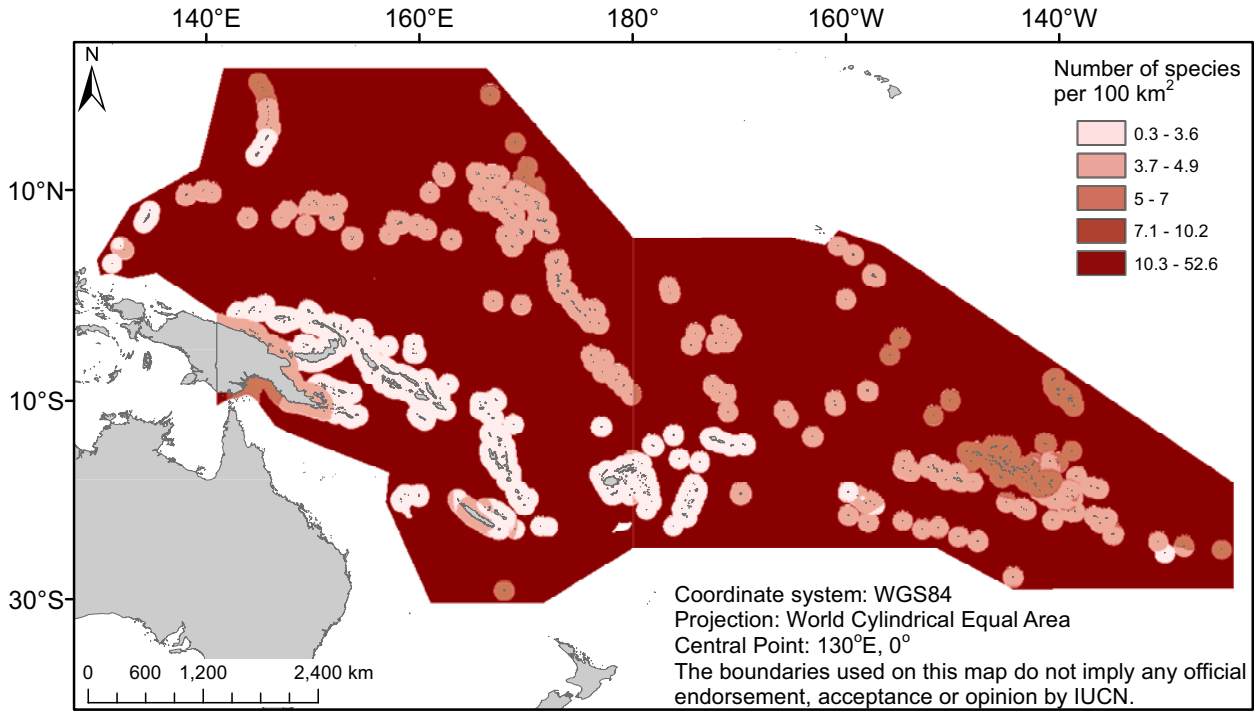


Figure 6: Distribution of the 656 habitat-forming marine species (classes Anthozoa, Hydrozoa, Liliopsida, Magnoliopsida and Polypodiopsida) in the Pacific Islands of Oceania.

Richness of assessed marine fishes

The spatial distribution of the 1,753 assessed marine fishes (classes Myxini, Chondrichthyes and Actinopterygii) generally follows the distribution of the overall assessed marine biodiversity (Figure 7). The highest richness, up to almost 950 species per 100 km^2, occurs off the coasts of Papua New Guinea, the Solomon Islands, New Caledonia and northern Palau. This high richness of assessed marine fishes along the coasts of northern Palau, around 830-845 species per 100 km^2, is striking relative to the much lower richness around southern Palauan islands and eastern Micronesia (less than about 600 species per 100 km^2). Diversity is lower in the eastern Pacific Islands, particularly from Baker Island and Tokelau east to the Pitcairn Islands. The exception is the Society Islands (French Polynesia), with 50-100 more species per 100 km^2 than the rest of French Polynesia.

However, these trends need to be interpreted with care, as less than 50% of the known marine fish biodiversity has been represented in this assessment. It is expected that the general trend of decreasing diversity west to east in the Pacific Islands will remain once all marine fishes have been assessed, as has been documented for other taxa (e.g., Carpenter and Springer 2005, Allen 2007, Polidoro et al. 2011).

Richness of threatened marine fishes

A relatively low proportion of assessed marine fishes (classes Myxini, Chondrichthyes and Actinopterygii) are assessed as threatened (62 species, about 3.5%). Mainland Papua New Guinea is home to the largest number of threatened species (31-41 species per 100 km^2). The spatial pattern generally follows that of the overall richness of assessed marine fishes, with relatively high richness of threatened species along the coasts of northern Palau and New Caledonia (Figure 8). The lowest number of threatened marine fishes (less than 12 species per 100 km^2) occurs in the southern, offshore region, including the Cook and Austral islands.

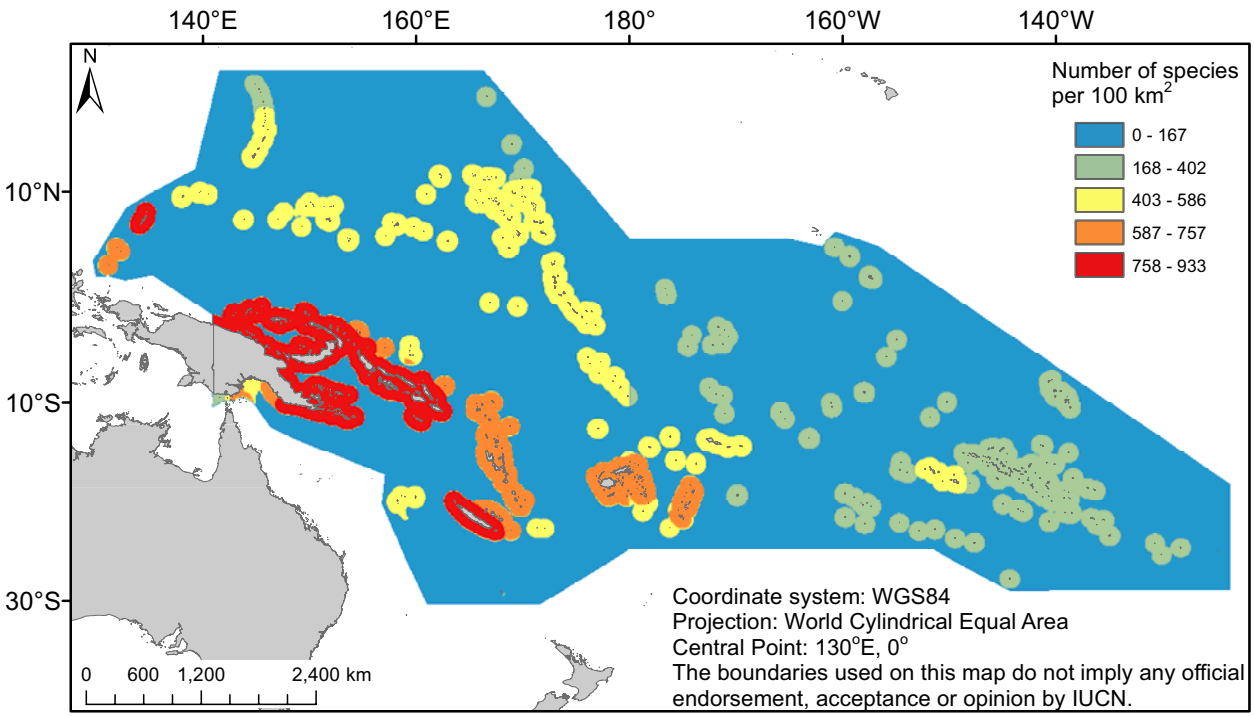


Figure 7: Distribution of the 1,753 marine fishes (classes Myxini, Chondrichthyes and Actinopterygii) in the Pacific Islands of Oceania that have been assessed against the IUCN Red List Categories and Criteria.

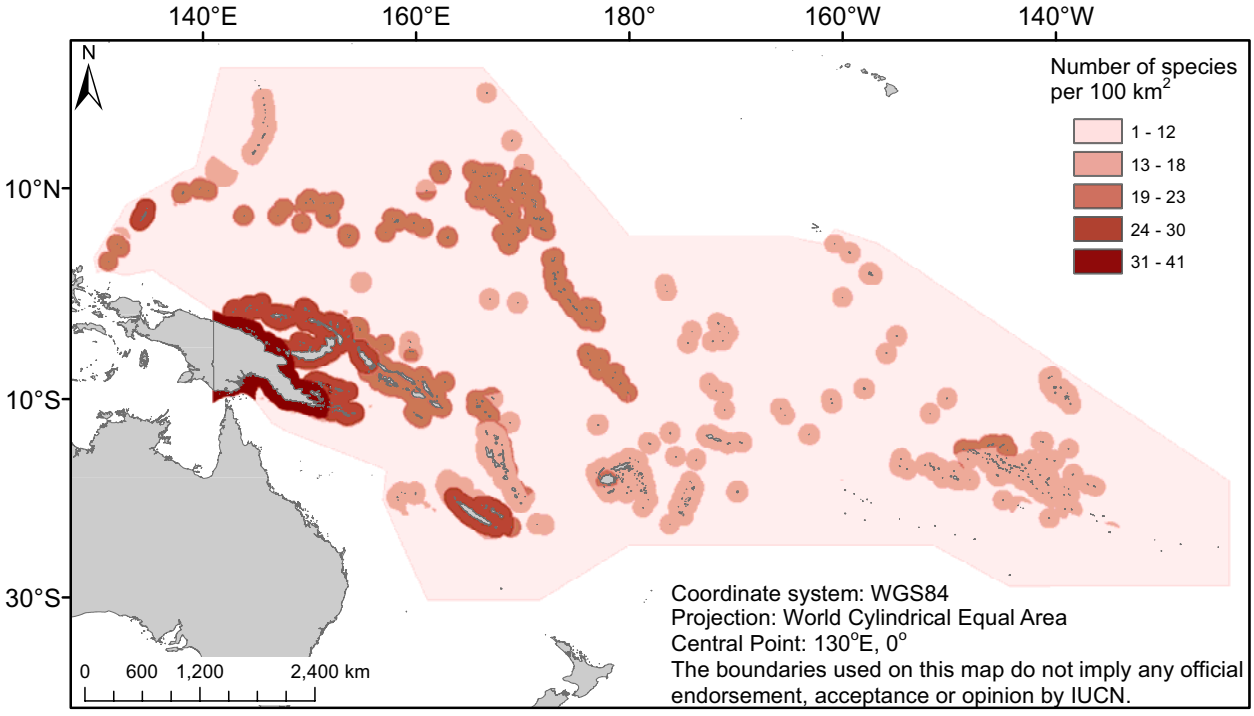


Figure 8: Distribution of the 62 marine fishes (classes Myxini, Chondrichthyes and Actinopterygii) in the Pacific Islands of Oceania that have been listed as threatened (Critically Endangered, Endangered or Vulnerable).

As the spatial trends in threatened marine fishes appear to closely follow the trends in assessed marine fishes, we explored the spatial distribution of the proportion of threatened fishes. The highest proportion of threatened marine fishes occurred in the offshore region, with up to 50% of the assessed fishes listed as threatened (Figure 9). These high proportions are likely driven by the relatively few assessed species in the offshore region, and the widely distributed pelagic tunas and sharks assessed as threatened on the basis of population declines. The proportion of threatened marine fishes is less than 7% for almost all coastal areas, with the highest coastal proportions in the northern Commonwealth of the Northern Mariana Islands, Milne Bay (southern Papua New Guinea) and Ducie (Pitcairn Islands). Lowest proportions are found near Guam, Palau, and from the Papua New Guinea islands east to Samoa.

Richness of Data Deficient marine fishes

The diversity of the 165 marine fishes assessed as Data Deficient is highest along mainland Papua New Guinea and the Bismarck Archipelago, as well as off Palau and New Caledonia (Figure 9). As Data Deficient species are typically characterized by few known specimens or plausible threats with impacts that have not yet been quantified, these areas should be considered priorities for future research. Fewer Data Deficient species are typically found further west, though there are some areas (e.g., the Society and Tuamotu archipelagos of French Polynesia) that have relatively more Data Deficient species than nearby islands. The lowest diversity occurs in the offshore waters, with only 1-6 species per 100 km^2.

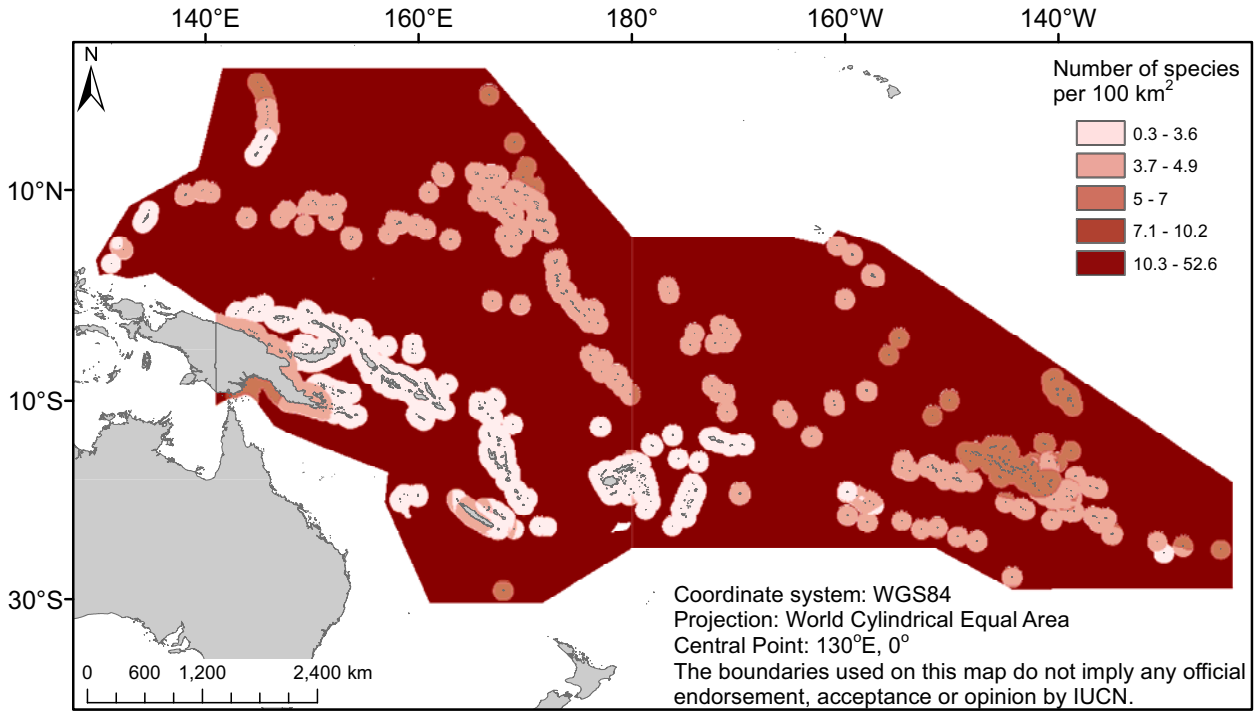


Figure 9: Relative proportion of threatened marine fishes, using the midpoint estimator recommended by IUCN (2011).

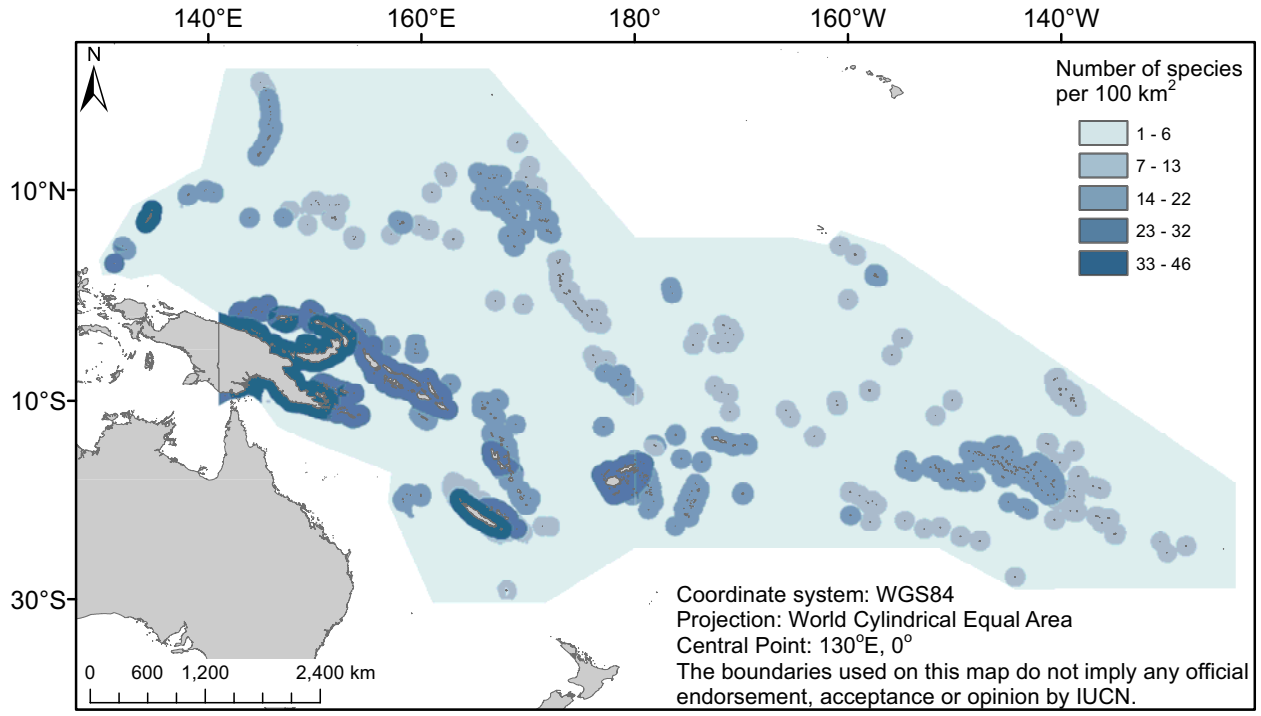


Figure 10: Distribution of the 165 marine fishes (classes Myxini, Chondrichthyes and Actinopterygii) in the Pacific Islands of Oceania that have been listed as Data Deficient against the IUCN Red List Categories and Criteria.

3.4 Major threats

Over 100,000 islands, spanning an area larger than that of the Australian continent, make up the Pacific Islands of Oceania. The remote nature of the islands and the seas surrounding them led to differing evolutionary histories, fostering unique marine ecosystems rich with specialized habitats and niches for the many endemic species.

While this isolation has encouraged the evolution of the Pacific Islands' abundant marine biodiversity, it also exacerbates the vulnerability of its species to extinction. When island-dependent marine species' populations decline and are far from other islands, the distance hinders immigration from other islands that could buffer against local extinctions. The vast majority of threats to the marine species of Oceania are a result of human activity, including overexploitation, habitat destruction, pollution, climate change and introduction of invasive species.

Overexploitation

Globally, the biggest threat currently facing marine biodiversity is overexploitation (Roberts and Hawkins 1999, Dulvy et al. 2009, Harnick et al. 2012). In the Pacific Islands of Oceania, over half the human population lives near the coast and depends almost exclusively on fish consumption for protein (Aswani et al. 2007). As the human population grows in the region, so too will the demand for fish and other marine resources, likely leading to harvest at an unsustainable rate.

Coastal fishery resources are overexploited in an estimated 55% of the Pacific Islands (Chin et al. 2011). Fishes and other marine animals harvested for subsistence use, as well as for the aquarium and live reef-fish trades are of particular concern, especially near large cities with growing human populations. More people are fishing, and using more advanced and efficient technologies (Chin et al. 2011). Other

coastal and marine resources are also exploited, including: mangroves, for firewood and construction materials (Ellison 2009); coral reefs, for sand and rock used in construction (Chin et al. 2011); and molluscs, such as cone snails, giant clams, and cephalopods, for subsistence and the aquarium trade.

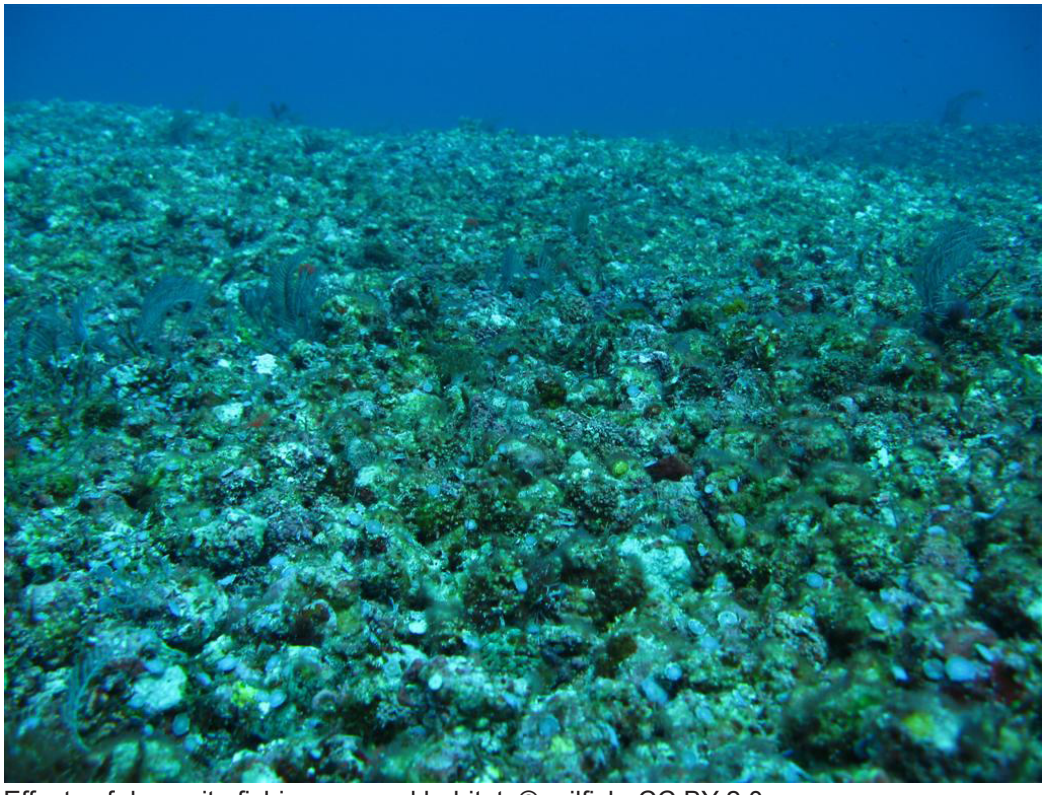
Conservation measures, including marine protected areas and harvest control rules, are being enacted to limit the overexploitation of marine resources in the Pacific Islands. In addition, many islands are remote and uninhabited, presumably providing marine and coastal resources with some refuge against overexploitation. Thus, although marine and coastal use is high in the region, relatively few exploited species are listed as threatened.

However, it is not just an issue of direct mortality of species (e.g., Jennings and Kaiser 1998). Exploitation can fundamentally alter the roles of species in their ecosystems in a variety of ways. By reducing the overall abundance of individuals, exploitation may lead to density-dependent changes in spawning behavior, juvenile survival, migrations, and other characteristics (Sadovy de Mitcheson 2016). Impacts on other species are also likely; for example, reductions in predator species abundance may allow prey species to increase rapidly in abundance (e.g., Frank et al. 2005).

Habitat destruction

In addition to these direct effects of exploitation, some common practices physically destroy or degrade habitats such as coral reefs. For example, the use of explosives and poisons on coral reefs can cause immense damage, resulting in ecosystem shifts that could reduce survival of both targeted and non-targeted species relying on those habitats.

However, habitat destruction in the marine realm is not limited to the effects of fishing and other forms of exploitation. In particular, mangroves are often cleared for development and urban growth (Ellison 2009). Although fairly limited in most Pacific Island countries and territories, land reclamation can have severe localized impacts (Chin et al. 2011).



Effects of dynamite fishing on coral habitat. © prilfish, CC BY 2.0

Pollution

Coastal and marine species in the Pacific Islands face enormous pressures from pollutants and toxins that are manifested in a variety of forms. Surface waters and water supplies are contaminated by human and animal wastes in nearly every country (SPREP 2016). Nutrient and sediment pollution from deforestation, agricultural runoff and poor land-use practices result in eutrophication and smothering of coastal benthic communities. The consequences of marine debris, especially plastics, include entanglement, ingestion and smothering. This is a major issue for many large marine vertebrates, and has been documented in 100% of sea turtle species, 66% of marine mammal species and 50% of sea bird species globally (Kühn et al. 2015).

Laysan albatross (*Phoebastria immutabilis*) listed as Near Threatened. Photo by A. Collins, Office of Marine Sanctuaries.

Climate change, sea level rise and severe weather

As the planet continues to warm, sea surface temperatures and ocean acidification will increase, and sea levels will continue to rise. These factors will result in major threats to ecosystems and biodiversity of the Pacific region in the future (SPREP 2016). Already, portions of the island nations of Tuvalu and Kiribati are beginning to become inundated and covered by the rising sea (Herman 2015). As sea levels continue to rise, these occurrences will increase in persistence and intensity. Also, as sea surface temperatures continue to increase, tropical storm frequency and severity will increase, destroying vital habitats, such as coral reefs, seagrass beds and mangrove stands, which will further compound the threats of climate change on marine biodiversity (SPREP 2016).

Flowering Tape Seagrass (*Enhalus acoroides*), assessed as Least Concern. © R. Tan

Identifying the expected changes and direct impacts on species richness and abundance is a challenge. There will likely be winners and losers. Species may take advantage of, or may evolve in response to, the impending impacts due to climate change. But these are not trivial issues, particularly for nearshore species and those with limited thermal tolerances.

Invasive species

Invasive species also pose significant threats to the biodiversity in Oceania. Invasive or introduced species ravage terrestrial crops, outcompete indigenous animals for food and habitat, introduce new diseases to local biota and prey upon indigenous species.

Major declines in terrestrial mammals and birds after the introduction of the Brown Tree Snake, *Boiga irregularis*, have been documented in Guam and the Commonwealth of the Northern Mariana Islands (Wiles et al. 2003). Seabird nesting colonies have been decimated by invasive mammals (e.g., rats, pigs and cats). However, the effects of invasive species in the marine realm are generally poorly known to date. The recent invasion of the Indo-Pacific lionfishes (*Pterois volitans* and *P. miles*) in the Caribbean has resulted in documented drastic declines of small, reef-associated bony fishes (Green et al. 2012) and species richness (Albins 2015). Instances of such declines in response to the establishment of an invasive species have not yet been observed in the waters of the Pacific Islands, but may pose a danger in the future.

Multiple stressors

Many of the foregoing activities and impacts are closely linked, such that the effects on marine biodiversity may be compounded. For example, climate change and ocean acidification may directly and negatively impact indigenous species, but abiotic factors may also actively facilitate the survival of invasive species.

3.5 Conservation measures in place

A key mechanism for conserving marine biodiversity is the establishment of effective and enforced marine protected areas. Large marine protected areas have gained popularity in the Pacific Islands. The Natural Park of the Coral Sea protects almost the entire New Caledonian exclusive economic zone. Palau will limit all commercial fishing and other extractive industries, such as deep sea mining, in 80% of its waters by 2020.

Presently, about 12% of the Pacific Islands' exclusive economic zones combined is designated as a protected area (UNEP and WCMC 2015). Nearly all of the species assessed in Oceania to date have a distribution that overlaps with at least one MPA within its range. However, enforcement of MPA regulations, and therefore the degree of protection for species, is highly variable between the Pacific Island countries and territories.

The Oceania region is politically and culturally complex, with 10 independent island nations, 3 self-governing or autonomous territories, and 10 territories or jurisdictions with varying degrees of autonomy and association with one of five metropolitan countries (Australia, France, New Zealand, the United Kingdom, or the United States).

Independent island nations in Oceania with specific national laws or ordinances related to the protection of threatened species include Fiji, the Marshall Islands, the Federated States of Micronesia, Palau, Tonga, and Vanuatu. Amongst the various national laws, the designated species to be protected range from a few species of sea turtles to any species declared by the state to be endangered or threatened. The Secretariat of the South Pacific Environmental Programme (SPREP) plays an important role in unifying regional conservation efforts. Although a number of regional conventions have been developed (e.g., Apia Convention 1976, Noumea Convention 1986, and Waigani Convention 1995), none to date are specifically designed for the protection of threatened or endangered species.

Similarly, some but not all countries are signatories to international treaties and conventions which include protection for some threatened coral, shark, or whale species. Such conventions, including the Convention on International Trade in Endangered Species of

Wild Fauna and Flora (CITES), the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean, and the International Convention for the Regulation of Whaling, are essential to the long term sustainability of marine resources. It is important to note that the degree of enforcement of national laws and regional or international conventions among countries and territories in the Oceania region is variable (Polidoro et al. 2011, SPREP 2016).

Pacific islanders have traditionally made use of a number of marine conservation methods, including local tenure, rights-based fishing (restricted entry), closed seasons, closed areas, size restrictions, and gear restrictions. Historically, these traditional systems played an important role in sustaining fisheries in the region. However, many of the traditional systems have broken down through the process of Western colonization and introduction of cash economies and many coastal areas, including coral reef ecosystems, are increasingly threatened by overexploitation and development.

3.6 Research and conservation needs

Research needs

Oceania is an extensive tropical region, comprising thousands of oceanic islands surrounded by a vast expanse of ocean waters. It boasts many diverse habitats and ecosystems that support a vast array of life forms, including at least 52 orders, over 300 families and more than 4,200 species of marine fishes, reptiles, birds and mammals. While all of the marine reptiles, birds and mammals have been comprehensively assessed, only 860 marine fish species had been published on the IUCN Red List prior to the 2015 workshops in Fiji. Now, about 1,750 of the more than 4,000 marine fishes in the Pacific Islands of Oceania have been assessed for extinction risk. However, over half of the fishes remain unassessed. Assessments for these unassessed species, particularly those of artisanal and subsistence importance, are urgently needed to provide a more complete understanding of how various threats affect marine vertebrates in the region and how conservation actions can be most effectively conceived and implemented.

Green Turtle (*Chelonia mydas*), assessed as Endangered. Photo by K. Pollock, U.S. Fish and Wildlife Service.

As part of each species assessment, research and conservation actions were identified where applicable. The most prevalent of research needs identified for the species of fishes assessed is for a greater understanding of the biology, habitats and ecology of species. For many species, we still lack basic biological and ecological data, as well as specific population information. Although great progress has been made in increasing the number of marine species that have been assessed in the region using the IUCN Red List Criteria, large gaps remain in the understanding of the basic habitat, ecology and life history traits for many Oceania species. For example, some small, cryptic species, such as the serranid *Pseudogramma pectoralis*, have only ever been collected using rotenone and have never been seen alive by humans. Consequently, virtually no information on the feeding habits, reproduction or ecology of the species is known. Even some species that are utilized commercially, such as the grouper, *Aetheloperca rogaa*, are not adequately understood or researched. To more completely understand the conservation status of marine organisms in Oceania, research is greatly required to fill the gaps in the knowledge of these species' basic life history traits.

Conservation needs

In order to effectively protect the marine biodiversity of the Pacific Islands of Oceania, additional conservation measures must be put into action beyond those which are now in place. Two very effective methods of conservation in the marine environment are the identification of key biodiversity areas (KBAs; Edgar et al. 2008) and the subsequent installation of marine protected area networks where the KBAs have been identified (McLeod et al. 2009). KBAs are an iterative and site-based methodology of identifying where conservation measures will be most effective in protecting biodiversity. Founded on the concepts of vulnerability and irreplaceability, KBAs enable conservation managers to identify places where (a) conservation is most needed to preserve biodiversity and (b) places where marine areas can feasibly be managed and protected (Langhammer et al. 2007). Where KBAs are identified, marine conservation managers and other stakeholders can delineate a network of protected areas that encompass the identified KBAs. In this way, a network of interconnected protected areas can be designated, allowing for high degrees of connectivity between the sites, as well as passage ways and refuge for highly mobile species (Eken et al. 2004).

Some species, such as highly migratory, pelagic species (e.g., Bigeye Tuna, Thunnus obesus), are not well protected by site-based conservation measures, and larger, more geographically inclusive MPAs need to be designated and enforced to protect them (Halpern et al. 2010). For example, the New Caledonian Coral Sea Marine Reserve is the largest existing no-take MPA in the world, encompassing some 1.3 million km^2 of pristine ocean area and ecosystems. It protects a multitude of sharks, whales, and fishes, as well as the world's third largest population of dugongs. Currently, French Polynesia is in the beginning planning stages of instituting a MPA similar to the Coral Sea Marine Reserve. Other large MPAs that limit or prohibit fishing in the Pacific Islands of Oceania may be necessary to help protect the populations of highly migratory, threatened species.

However, large, multi-jurisdictional MPAs are not the only effective means of instituting protected areas for marine environments (Weeks et al. 2014). For example, community-based management strategies have been effective in establishing and maintaining small, no-take marine protected areas on the islands of Balicasag and Pamilacan in the Philippines. Between the time of inception of these protected areas in 1984 and 1999, coral cover increased by 119% in Balicasag compared to only 67% in the non-sanctuary area. Also, abundances of commercially viable fishes increased inside the protected areas, while the numbers of the same commercial species in the unprotected areas adjacent to them decreased (Christie et al. 2002). In Fiji, there are a number of these small, community-based protected areas, and more being planned. By extending this approach to more island nations in Oceania, more people in villages across the region will be able to directly contribute to the protection of marine biota, and biodiversity can be preserved in the region more effectively (Mills et al. 2011).

4. Conclusions

4.1 Overview

Resources in the Pacific Islands are vulnerable to over-harvest, deforestation, coastal development and agricultural expansion, with habitat degradation and invasive alien species presenting potential serious threats to marine biodiversity. Therefore, effective conservation measures are needed to safeguard ecosystems and the species they contain. The lack of basic data on species, out-of-date information, and poorly studied areas means that often little is known about species in the region making it difficult to implement conservation plans. In order to conserve the species that are so vital for the health, culture and livelihoods of Pacific Islanders, our knowledge of these species must be improved.

This report identifies Pacific Island species that are threatened with extinction at the global level, according to the IUCN Red List Categories and Criteria, the world's most widely accepted methodology for measuring extinction risk. The status of species is based on evaluations made by a network of experts, who carried out biodiversity assessments according to the IUCN Red List Categories and Criteria. Complete assessments are freely available on the IUCN Red List website: http://www.iucnredlist.org. Major threats are identified for each taxonomic group, and recommendations for conservation action are suggested.

4.2 Recommendations

Marine management and policy

With the inclusion of the most recent species assessments in Oceania, 9.8% of all taxa in the region are considered threatened and face an elevated risk of extinction, and 7.9% are Near Threatened. These species are most likely to benefit from conservation actions, and Red List assessments of these species are ideal for prioritizing and designating marine conservation areas and can inform the implementation of marine legislative agendas. However, Oceania consists of numerous jurisdictional entities that differ in size and scope, complicating the coordination and enforcement of international fishing regulations and marine management practices throughout the region. Regional prioritization workshops offer individual nations and territories opportunities to exchange conservation goals and priorities with other regional countries and formulate a shared and organized approach to designating marine protected areas and the formulation of legislation aimed at controlling national and international fishing fleets, as well as the types of fishing gear they use. Inter-governmental cooperation between countries in Oceania will bolster the effectiveness of management in existing protected areas and help to reduce illegal and destructive fishing practices.

It is critically important that all species of commercial or subsistence livelihood importance are assessed in the near future. However, even when globally assessed as Least Concern, many of these exploited species are overfished locally, especially on heavily population islands and around urban areas where fishing pressure is high. Although these species are not likely to become biologically extinct in the near future, local, ecological and economic extinctions require local interventions.

Further recommendations for marine management and policy in Oceania include:

- Use of the Red List to guide policy and legislative decisions in order to implement conservation actions that will improve the status of threatened marine species in the region.
- Refine and expand existing multi-national fisheries conservation initiatives.

- Enforce measures to limit or reduce targeted catch of threatened species and/or by-catch of threatened species.
- Ensure sustainable management practices are adhered to for species susceptible to exploitation.
- Enact science-based management plans that eliminate overfishing for all marine biota, specifically for threatened species.
- Relevant laws and policies, including environmental impact assessments should be adopted to ensure best practice in any coastal developments.

Marine protected areas and conservation action

Marine protected areas (MPAs) are fundamental elements for preserving and protecting biodiversity, including threatened biota (Edgar and Barrett 1997, Jamieson and Levings 2001). As of May 2016, the World Database on Protected Areas (WDPA) reports that there are 413 designated MPAs in Oceania that are either entirely or partially in the marine realm (WDPA 2016). While some of these areas are highly-enforced no-take zones, many lack the funding, governance, infrastructure and human resources to effectively govern and enforce conservation regulations.

Recommendations for the improvement of marine protected areas include:

- Ensuring that all MPAs and other areas with similar fishing restrictions provide adequate and effective protection to threatened species as well as the critical habitats they utilize.
- Extend or incorporate area-based conservation measures that will effectively satisfy or exceed the 10% global coverage of marine area, as set forth in the Aichi Target 11 (CBD 2010), especially in spawning areas, juvenile nursery areas and in localities where threatened species most likely persist.
- Institute collaborative efforts between Oceania nations and territories which will improve MPA designation and management efforts to include shared management of trans-boundary fish stocks and complementarity on MPAs in adjacent and neighboring marine areas.
- Biosecurity vigilance should be increased at land, air and sea entry points throughout the Pacific to prevent the spread of invasive species.
- Fisheries managers and national legislatures should implement precautionary harvest objectives in accordance with Aichi Targets 4 and 6 that focus on Maximum Sustainable Yield and Maximum Economic Yield.

Research and training

IUCN Red List Assessment Workshops rely on numerous international, regional and national experts who possess extensive knowledge on the distributions, populations, habitats and ecology, use and trade and threats to marine biota. In the compilation of data for the purpose of assessing relative extinction risk, gaps in knowledge of these important areas for some species were identified.

To fill the gaps in our knowledge, research is recommended in the following areas:

- Improve and expand the fisheries-dependent data collection and dissemination for commercial fisheries regarding catch composition, by-catch statistics, measured landings, and fishing effort for all commercial, artisanal and subsistence fisheries in the region.
- Increase efforts to gather and analyze fisheries-independent data, especially for Data Deficient and threatened species, and ensure that the data are adequately shared and reported to relevant management bodies and scientific organizations in the region.

- Complete IUCN Red List assessments for the remaining fish species of the region.
- Carry out further research on the distribution, population, threats, ecological requirements and taxonomy for threatened and Data Deficient species, which will enable the production of a comprehensive dataset for marine biodiversity.
- Regularly revise the data for assessed species to monitor the changing status of populations and to ascertain whether any recommended conservation measures put in place are working.
- Examine species' distributions in more detail in order to identify key priority areas for conservation and protection of marine species and their habitats.
- Educate stakeholders and local fishers in sustainable biological resource use, and ensure that local fisher community perspectives are used to reinforce and strengthen assessments.
- Train regional fishers, managers and local people in taxonomy to accurately identify specimens to the species-level, ensuring proper identification of retained specimens. In many cases, landings are recorded only to the family or genus level, and often the identifications of marine specimens, whether at the family, genus or species level, are incorrect. This complicates the process of adequately identifying and quantifying the impacts of threats on individual species
- Expand species composition surveys, especially in more remote areas of the region, to gain a better understanding of the biota composition in the region.

4.3 Application of project results

To date, there are nearly 12,000 assessments for marine biota published on the Red List of Threatened Species. The information gathered for each species is freely available to download from the IUCN Red List website (www.iucnredlist.org). The compiled data can be used to support future research and enable monitoring and conservation action at national and Pacific-wide levels. This is especially true for Data Deficient species and species in a threatened or Near Threatened Category. As new information or data become available over time, species will be re-assessed and data contained in the Red List will be amended.

The data in each species account provide key resources for decision-makers, policy-makers, natural resource managers, environmental planners and NGOs. Many Pacific Island countries are signatory to international conventions aimed at conserving biodiversity which are particularly relevant to the conservation and protection of species and their habitats. The challenge now is to ensure that results from this project are used to inform such conventions and policies, to identify priority sites for biodiversity conservation and to prepare and implement species recovery plans for the identified threatened species in the Pacific Islands.

One of the most effective ways to utilize Red List assessments for conservation purposes is the identification and delineation of key biodiversity areas (KBAs). KBAs effectively and iteratively identify areas of species composition that are either highly vulnerable (threatened) or irreplaceable (restricted range) and prioritize areas that will benefit the most from site-level conservation actions (Edgar et al. 2008). Red List assessments are integral in providing essential information regarding a species' distribution, extinction risk status and plausible threats. Red List assessments are available for numerous marine vertebrates (including all mammals, reptiles and birds), habitat forming species (including all corals, mangroves and seagrasses) and select invertebrates, which will assist in the initial identification of KBAs and in the overall process of advanced marine spatial planning and identification of conservation priorities.

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Note: for the extensive literature used to compile each species assessment, please see each species account on the IUCN Red List (www.iucnredlist.org).

Appendix I: Red List status of marine fishes of the Pacific Islands of Oceania assessed at the 2015 workshops in Fiji

Table AI.1: Red List status of marine fishes of the Pacific Islands of Oceania (listed phylogenentically by Order, then alphabetically by Family and Species) assessed at the 2015 workshops in Fiji. Note that criteria are only included for species listed as threatened (i.e., Critically Endangered, Endangered, or Vulnerable).

Order	Family	Species	Category	Criteria
Beryciformes	Holocentridae	*Myripristis adusta*	LC	
Beryciformes	Holocentridae	*Myripristis amaena*	LC	
Beryciformes	Holocentridae	*Myripristis berndti*	LC	
Beryciformes	Holocentridae	*Myripristis botche*	LC	
Beryciformes	Holocentridae	*Myripristis chryseres*	LC	
Beryciformes	Holocentridae	*Myripristis earlei*	LC	
Beryciformes	Holocentridae	*Myripristis hexagona*	LC	
Beryciformes	Holocentridae	*Myripristis kuntee*	LC	
Beryciformes	Holocentridae	*Myripristis murdjan*	LC	
Beryciformes	Holocentridae	*Myripristis pralinia*	LC	
Beryciformes	Holocentridae	*Myripristis randalli*	LC	
Beryciformes	Holocentridae	*Myripristis tiki*	DD	
Beryciformes	Holocentridae	*Myripristis trachyacron*	LC	
Beryciformes	Holocentridae	*Myripristis violacea*	LC	
Beryciformes	Holocentridae	*Myripristis vittata*	LC	
Beryciformes	Holocentridae	*Myripristis woodsi*	LC	
Beryciformes	Holocentridae	*Neoniphon argenteus*	LC	
Beryciformes	Holocentridae	*Neoniphon aurolineatus*	LC	
Beryciformes	Holocentridae	*Neoniphon opercularis*	LC	
Beryciformes	Holocentridae	*Neoniphon sammara*	LC	
Beryciformes	Holocentridae	*Ostichthys archiepiscopus*	LC	
Beryciformes	Holocentridae	*Ostichthys brachygnathus*	DD	
Beryciformes	Holocentridae	*Ostichthys delta*	DD	
Beryciformes	Holocentridae	*Ostichthys hypsipterygion*	DD	
Beryciformes	Holocentridae	*Ostichthys japonicus*	LC	
Beryciformes	Holocentridae	*Ostichthys kaianus*	LC	
Beryciformes	Holocentridae	*Ostichthys ovaloculus*	DD	
Beryciformes	Holocentridae	*Ostichthys sandix*	LC	
Beryciformes	Holocentridae	*Plectrypops lima*	LC	
Beryciformes	Holocentridae	*Sargocentron caudimaculatum*	LC	
Beryciformes	Holocentridae	*Sargocentron cornutum*	LC	
Beryciformes	Holocentridae	*Sargocentron diadema*	LC	
Beryciformes	Holocentridae	*Sargocentron dorsomaculatum*	LC	
Beryciformes	Holocentridae	*Sargocentron ensifer*	LC	
Beryciformes	Holocentridae	*Sargocentron hormion*	LC	
Beryciformes	Holocentridae	*Sargocentron inaequalis*	DD	
Beryciformes	Holocentridae	*Sargocentron iota*	LC	
Beryciformes	Holocentridae	*Sargocentron ittodai*	LC	

Order	Family	Species	Category Criteria
Beryciformes	Holocentridae	*Sargocentron lepros*	LC
Beryciformes	Holocentridae	*Sargocentron megalops*	DD
Beryciformes	Holocentridae	*Sargocentron melanospilos*	LC
Beryciformes	Holocentridae	*Sargocentron microstoma*	LC
Beryciformes	Holocentridae	*Sargocentron praslin*	LC
Beryciformes	Holocentridae	*Sargocentron punctatissimum*	LC
Beryciformes	Holocentridae	*Sargocentron rubrum*	LC
Beryciformes	Holocentridae	*Sargocentron spiniferum*	LC
Beryciformes	Holocentridae	*Sargocentron tiere*	LC
Beryciformes	Holocentridae	*Sargocentron tiereoides*	LC
Beryciformes	Holocentridae	*Sargocentron violaceum*	LC
Scorpaeniformes	Dactylopteridae	*Dactyloptena orientalis*	LC
Scorpaeniformes	Platycephalidae	*Cociella punctata*	LC
Scorpaeniformes	Platycephalidae	*Cymbacephalus beauforti*	LC
Scorpaeniformes	Platycephalidae	*Inegocia japonica*	LC
Scorpaeniformes	Platycephalidae	*Kumococius rodericensis*	LC
Scorpaeniformes	Platycephalidae	*Onigocia bimaculata*	LC
Scorpaeniformes	Platycephalidae	*Onigocia macrolepis*	LC
Scorpaeniformes	Platycephalidae	*Onigocia oligolepis*	LC
Scorpaeniformes	Platycephalidae	*Onigocia pedimacula*	LC
Scorpaeniformes	Platycephalidae	*Platycephalus indicus*	DD
Scorpaeniformes	Platycephalidae	*Rogadius asper*	LC
Scorpaeniformes	Platycephalidae	*Rogadius mcgroutheri*	DD
Scorpaeniformes	Platycephalidae	*Rogadius patriciae*	LC
Scorpaeniformes	Platycephalidae	*Rogadius pristiger*	LC
Scorpaeniformes	Platycephalidae	*Rogadius serratus*	LC
Scorpaeniformes	Platycephalidae	*Rogadius welanderi*	LC
Scorpaeniformes	Platycephalidae	*Sunagocia arenicola*	LC
Scorpaeniformes	Platycephalidae	*Sunagocia otaitensis*	LC
Scorpaeniformes	Platycephalidae	*Thysanophrys celebica*	LC
Scorpaeniformes	Platycephalidae	*Thysanophrys chiltonae*	LC
Scorpaeniformes	Scorpaenidae	*Caracanthus maculatus*	LC
Scorpaeniformes	Scorpaenidae	*Caracanthus unipinna*	LC
Scorpaeniformes	Scorpaenidae	*Dendrochirus biocellatus*	LC
Scorpaeniformes	Scorpaenidae	*Dendrochirus brachypterus*	LC
Scorpaeniformes	Scorpaenidae	*Dendrochirus tuamotuensis*	DD
Scorpaeniformes	Scorpaenidae	*Dendrochirus zebra*	LC
Scorpaeniformes	Scorpaenidae	*Iracundus signifer*	LC
Scorpaeniformes	Scorpaenidae	*Neomerinthe megalepis*	LC
Scorpaeniformes	Scorpaenidae	*Neomerinthe naevosa*	LC
Scorpaeniformes	Scorpaenidae	*Parascorpaena armata*	LC
Scorpaeniformes	Scorpaenidae	*Parascorpaena aurita*	LC
Scorpaeniformes	Scorpaenidae	*Parascorpaena mcadamsi*	LC
Scorpaeniformes	Scorpaenidae	*Parascorpaena moultoni*	LC

Order	Family	Species	Category Criteria
Scorpaeniformes	Scorpaenidae	*Parascorpaena picta*	LC
Scorpaeniformes	Scorpaenidae	*Phenacoscorpius adenensis*	LC
Scorpaeniformes	Scorpaenidae	*Phenacoscorpius longilineatus*	LC
Scorpaeniformes	Scorpaenidae	*Phenacoscorpius longirostris*	DD
Scorpaeniformes	Scorpaenidae	*Pontinus macrocephalus*	LC
Scorpaeniformes	Scorpaenidae	*Pontinus rhodochrous*	LC
Scorpaeniformes	Scorpaenidae	*Pteroidichthys amboinensis*	LC
Scorpaeniformes	Scorpaenidae	*Pteroidichthys noronhai*	LC
Scorpaeniformes	Scorpaenidae	*Pterois antennata*	LC
Scorpaeniformes	Scorpaenidae	*Pterois paucispinula*	LC
Scorpaeniformes	Scorpaenidae	*Pterois radiata*	LC
Scorpaeniformes	Scorpaenidae	*Pterois volitans*	LC
Scorpaeniformes	Scorpaenidae	*Rhinopias aphanes*	LC
Scorpaeniformes	Scorpaenidae	*Rhinopias cea*	DD
Scorpaeniformes	Scorpaenidae	*Rhinopias frondosa*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaena bulacephala*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaena cardinalis*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaena lacrimata*	DD
Scorpaeniformes	Scorpaenidae	*Scorpaena onaria*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaenodes albaiensis*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaenodes corallinus*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaenodes evides*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaenodes guamensis*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaenodes hirsutus*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaenodes kelloggi*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaenodes minor*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaenodes parvipinnis*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaenodes quadrispinosus*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaenodes varipinnis*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaenopsis crenulata*	DD
Scorpaeniformes	Scorpaenidae	*Scorpaenopsis diabolus*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaenopsis eschmeyeri*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaenopsis macrochir*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaenopsis neglecta*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaenopsis oxycephala*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaenopsis papuensis*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaenopsis possi*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaenopsis pusilla*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaenopsis ramaraoi*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaenopsis venosa*	LC
Scorpaeniformes	Scorpaenidae	*Scorpaenopsis vittapinna*	LC
Scorpaeniformes	Scorpaenidae	*Sebastapistes cyanostigma*	LC
Scorpaeniformes	Scorpaenidae	*Sebastapistes fowleri*	LC

Order	Family	Species	Category Criteria
Scorpaeniformes	Scorpaenidae	*Sebastapistes galactacma*	LC
Scorpaeniformes	Scorpaenidae	*Sebastapistes mauritiana*	LC
Scorpaeniformes	Scorpaenidae	*Sebastapistes strongia*	LC
Scorpaeniformes	Scorpaenidae	*Sebastapistes tinkhami*	LC
Scorpaeniformes	Scorpaenidae	*Taenianotus triacanthus*	LC
Scorpaeniformes	Synanceiidae	*Erosa erosa*	LC
Scorpaeniformes	Synanceiidae	*Inimicus caledonicus*	LC
Aulopiformes	Synodontidae	*Saurida flamma*	LC
Aulopiformes	Synodontidae	*Saurida gracilis*	LC
Aulopiformes	Synodontidae	*Saurida nebulosa*	LC
Aulopiformes	Synodontidae	*Synodus binotatus*	LC
Aulopiformes	Synodontidae	*Synodus capricornis*	LC
Aulopiformes	Synodontidae	*Synodus dermatogenys*	LC
Aulopiformes	Synodontidae	*Synodus doaki*	LC
Aulopiformes	Synodontidae	*Synodus hoshinonis*	LC
Aulopiformes	Synodontidae	*Synodus jaculum*	LC
Aulopiformes	Synodontidae	*Synodus kaianus*	LC
Aulopiformes	Synodontidae	*Synodus lobeli*	LC
Aulopiformes	Synodontidae	*Synodus macrocephalus*	LC
Aulopiformes	Synodontidae	*Synodus oculeus*	LC
Aulopiformes	Synodontidae	*Synodus pylei*	DD
Aulopiformes	Synodontidae	*Synodus rubromarmoratus*	LC
Aulopiformes	Synodontidae	*Synodus similis*	LC
Aulopiformes	Synodontidae	*Synodus tectus*	LC
Aulopiformes	Synodontidae	*Synodus variegatus*	LC
Aulopiformes	Synodontidae	*Trachinocephalus myops*	LC
Perciformes	Caesionidae	*Caesio caerulaurea*	LC
Perciformes	Caesionidae	*Caesio cuning*	LC
Perciformes	Caesionidae	*Caesio lunaris*	LC
Perciformes	Caesionidae	*Caesio teres*	LC
Perciformes	Caesionidae	*Dipterygonotus balteatus*	LC
Perciformes	Caesionidae	*Gymnocaesio gymnoptera*	LC
Perciformes	Caesionidae	*Pterocaesio chrysozona*	LC
Perciformes	Caesionidae	*Pterocaesio digramma*	LC
Perciformes	Caesionidae	*Pterocaesio lativittata*	LC
Perciformes	Caesionidae	*Pterocaesio marri*	LC
Perciformes	Caesionidae	*Pterocaesio pisang*	LC
Perciformes	Caesionidae	*Pterocaesio tessellata*	LC
Perciformes	Caesionidae	*Pterocaesio tile*	LC
Perciformes	Caesionidae	*Pterocaesio trilineata*	LC
Perciformes	Carangidae	*Alectis ciliaris*	LC
Perciformes	Carangidae	*Alectis indica*	LC
Perciformes	Carangidae	*Alepes apercna*	LC

Order	Family	Species	Category Criteria
Perciformes	Carangidae	*Alepes kleinii*	LC
Perciformes	Carangidae	*Alepes vari*	LC
Perciformes	Carangidae	*Atule mate*	LC
Perciformes	Carangidae	*Carangoides bajad*	LC
Perciformes	Carangidae	*Carangoides chrysophrys*	LC
Perciformes	Carangidae	*Carangoides coeruleopinnatus*	LC
Perciformes	Carangidae	*Carangoides dinema*	LC
Perciformes	Carangidae	*Carangoides equula*	LC
Perciformes	Carangidae	*Carangoides ferdau*	LC
Perciformes	Carangidae	*Carangoides fulvoguttatus*	LC
Perciformes	Carangidae	*Carangoides gymnostethus*	LC
Perciformes	Carangidae	*Carangoides hedlandensis*	LC
Perciformes	Carangidae	*Carangoides humerosus*	LC
Perciformes	Carangidae	*Carangoides malabaricus*	LC
Perciformes	Carangidae	*Carangoides oblongus*	LC
Perciformes	Carangidae	*Carangoides orthogrammus*	LC
Perciformes	Carangidae	*Carangoides plagiotaenia*	LC
Perciformes	Carangidae	*Carangoides talamparoides*	LC
Perciformes	Carangidae	*Caranx heberi*	LC
Perciformes	Carangidae	*Caranx ignobilis*	LC
Perciformes	Carangidae	*Caranx lugubris*	LC
Perciformes	Carangidae	*Caranx melampygus*	LC
Perciformes	Carangidae	*Caranx papuensis*	LC
Perciformes	Carangidae	*Caranx sexfasciatus*	LC
Perciformes	Carangidae	*Caranx tille*	LC
Perciformes	Carangidae	*Decapterus macarellus*	LC
Perciformes	Carangidae	*Decapterus macrosoma*	LC
Perciformes	Carangidae	*Decapterus muroadsi*	LC
Perciformes	Carangidae	*Decapterus russelli*	LC
Perciformes	Carangidae	*Decapterus tabl*	LC
Perciformes	Carangidae	*Elagatis bipinnulata*	LC
Perciformes	Carangidae	*Gnathanodon speciosus*	LC
Perciformes	Carangidae	*Megalaspis cordyla*	LC
Perciformes	Carangidae	*Naucrates ductor*	LC
Perciformes	Carangidae	*Pantolabus radiatus*	LC
Perciformes	Carangidae	*Scomberoides commersonnianus*	LC
Perciformes	Carangidae	*Scomberoides lysan*	LC
Perciformes	Carangidae	*Scomberoides tala*	LC
Perciformes	Carangidae	*Scomberoides tol*	LC
Perciformes	Carangidae	*Selar boops*	LC
Perciformes	Carangidae	*Selar crumenophthalmus*	LC
Perciformes	Carangidae	*Selaroides leptolepis*	LC
Perciformes	Carangidae	*Seriola dumerili*	LC

Order	Family	Species	Category Criteria
Perciformes	Carangidae	*Seriola hippos*	LC
Perciformes	Carangidae	*Seriola lalandi*	LC
Perciformes	Carangidae	*Seriola rivoliana*	LC
Perciformes	Carangidae	*Seriolina nigrofasciata*	LC
Perciformes	Carangidae	*Trachinotus anak*	DD
Perciformes	Carangidae	*Trachinotus baillonii*	LC
Perciformes	Carangidae	*Trachinotus blochii*	LC
Perciformes	Carangidae	*Ulua aurochs*	LC
Perciformes	Carangidae	*Ulua mentalis*	LC
Perciformes	Carangidae	*Uraspis helvola*	LC
Perciformes	Carangidae	*Uraspis urapsis*	LC
Perciformes	Cirrhitidae	*Amblycirrhitus bimacula*	LC
Perciformes	Cirrhitidae	*Amblycirrhitus unimacula*	LC
Perciformes	Cirrhitidae	*Cirrhitichthys aprinus*	LC
Perciformes	Cirrhitidae	*Cirrhitichthys falco*	LC
Perciformes	Cirrhitidae	*Cirrhitichthys oxycephalus*	LC
Perciformes	Cirrhitidae	*Cirrhitops hubbardi*	LC
Perciformes	Cirrhitidae	*Cirrhitus albopunctatus*	DD
Perciformes	Cirrhitidae	*Cirrhitus pinnulatus*	LC
Perciformes	Cirrhitidae	*Cyprinocirrhites polyactis*	LC
Perciformes	Cirrhitidae	*Isocirrhitus sexfasciatus*	DD
Perciformes	Cirrhitidae	*Itycirrhitus wilhelmi*	LC
Perciformes	Cirrhitidae	*Neocirrhites armatus*	LC
Perciformes	Cirrhitidae	*Notocirrhitus splendens*	LC
Perciformes	Cirrhitidae	*Oxycirrhites typus*	LC
Perciformes	Cirrhitidae	*Paracirrhites arcatus*	LC
Perciformes	Cirrhitidae	*Paracirrhites bicolor*	DD
Perciformes	Cirrhitidae	*Paracirrhites forsteri*	LC
Perciformes	Cirrhitidae	*Paracirrhites hemistictus*	LC
Perciformes	Cirrhitidae	*Paracirrhites nisus*	LC
Perciformes	Cirrhitidae	*Paracirrhites xanthus*	LC
Perciformes	Creediidae	*Chalixodytes tauensis*	LC
Perciformes	Creediidae	*Crystallodytes cookei*	LC
Perciformes	Creediidae	*Crystallodytes enderburyensis*	LC
Perciformes	Creediidae	*Limnichthys fasciatus*	LC
Perciformes	Creediidae	*Limnichthys nitidus*	LC
Perciformes	Eleotridae	*Belobranchus belobranchus*	DD
Perciformes	Eleotridae	*Bostrychus sinensis*	LC
Perciformes	Eleotridae	*Bostrychus zonatus*	DD
Perciformes	Eleotridae	*Bunaka gyrinoides*	LC
Perciformes	Eleotridae	*Butis amboinensis*	LC
Perciformes	Eleotridae	*Butis butis*	LC
Perciformes	Eleotridae	*Calumia godeffroyi*	LC

Order	Family	Species	Category	Criteria
Perciformes	Eleotridae	*Calumia profunda*	LC	
Perciformes	Eleotridae	*Eleotris acanthopoma*	LC	
Perciformes	Eleotridae	*Eleotris fusca*	LC	
Perciformes	Eleotridae	*Eleotris melanosoma*	LC	
Perciformes	Eleotridae	*Giuris margaritacea*	LC	
Perciformes	Eleotridae	*Ophiocara porocephala*	LC	
Perciformes	Gerreidae	*Gerres erythrourus*	LC	
Perciformes	Gerreidae	*Gerres filamentosus*	LC	
Perciformes	Gerreidae	*Gerres longirostris*	LC	
Perciformes	Gerreidae	*Gerres oblongus*	LC	
Perciformes	Gerreidae	*Gerres oyena*	LC	
Perciformes	Gerreidae	*Gerres subfasciatus*	LC	
Perciformes	Gerreidae	*Pentaprion longimanus*	LC	
Perciformes	Gobiidae	*Acentrogobius caninus*	LC	
Perciformes	Gobiidae	*Akihito futuna*	CR	B1ab(ii,iii)
Perciformes	Gobiidae	*Amblyeleotris wheeleri*	LC	
Perciformes	Gobiidae	*Amblygobius buanensis*	LC	
Perciformes	Gobiidae	*Amblygobius sphynx*	LC	
Perciformes	Gobiidae	*Ancistrogobius yanoi*	LC	
Perciformes	Gobiidae	*Arcygobius baliurus*	DD	
Perciformes	Gobiidae	*Asterropteryx ensifera*	LC	
Perciformes	Gobiidae	*Asterropteryx senoui*	LC	
Perciformes	Gobiidae	*Asterropteryx spinosa*	LC	
Perciformes	Gobiidae	*Austrolethops wardi*	LC	
Perciformes	Gobiidae	*Awaous guamensis*	LC	
Perciformes	Gobiidae	*Awaous melanocephalus*	DD	
Perciformes	Gobiidae	*Barbuligobius boehlkei*	LC	
Perciformes	Gobiidae	*Bathygobius aeolosoma*	LC	
Perciformes	Gobiidae	*Bryaninops amplus*	LC	
Perciformes	Gobiidae	*Bryaninops erythrops*	LC	
Perciformes	Gobiidae	*Bryaninops isis*	LC	
Perciformes	Gobiidae	*Bryaninops loki*	LC	
Perciformes	Gobiidae	*Bryaninops ridens*	LC	
Perciformes	Gobiidae	*Bryaninops tigris*	LC	
Perciformes	Gobiidae	*Bryaninops yongei*	LC	
Perciformes	Gobiidae	*Cabillus lacertops*	LC	
Perciformes	Gobiidae	*Cabillus tongarevae*	LC	
Perciformes	Gobiidae	*Callogobius clitellus*	LC	
Perciformes	Gobiidae	*Caragobius urolepis*	LC	
Perciformes	Gobiidae	*Cryptocentrus caeruleomaculatus*	LC	
Perciformes	Gobiidae	*Cryptocentrus maudae*	LC	
Perciformes	Gobiidae	*Cryptocentrus strigilliceps*	LC	
Perciformes	Gobiidae	*Ctenogobiops aurocingulus*	LC	

Order	Family	Species	Category Criteria
Perciformes	Gobiidae	*Ctenogobiops crocineus*	LC
Perciformes	Gobiidae	*Ctenogobiops feroculus*	LC
Perciformes	Gobiidae	*Ctenogobiops maculosus*	LC
Perciformes	Gobiidae	*Discordipinna griessingeri*	LC
Perciformes	Gobiidae	*Drombus globiceps*	LC
Perciformes	Gobiidae	*Drombus halei*	LC
Perciformes	Gobiidae	*Eugnathogobius mindora*	LC
Perciformes	Gobiidae	*Eviota afelei*	LC
Perciformes	Gobiidae	*Eviota atriventris*	LC
Perciformes	Gobiidae	*Eviota bifasciata*	LC
Perciformes	Gobiidae	*Eviota cometa*	LC
Perciformes	Gobiidae	*Eviota deminuta*	LC
Perciformes	Gobiidae	*Eviota disrupta*	LC
Perciformes	Gobiidae	*Eviota distigma*	LC
Perciformes	Gobiidae	*Eviota dorsimaculata*	LC
Perciformes	Gobiidae	*Eviota dorsogilva*	LC
Perciformes	Gobiidae	*Eviota fallax*	LC
Perciformes	Gobiidae	*Eviota fasciola*	LC
Perciformes	Gobiidae	*Eviota herrei*	LC
Perciformes	Gobiidae	*Eviota hinanoae*	LC
Perciformes	Gobiidae	*Eviota infulata*	LC
Perciformes	Gobiidae	*Eviota jewettae*	LC
Perciformes	Gobiidae	*Eviota lachdeberei*	LC
Perciformes	Gobiidae	*Eviota lacrimae*	LC
Perciformes	Gobiidae	*Eviota lacrimosa*	LC
Perciformes	Gobiidae	*Eviota latifasciata*	LC
Perciformes	Gobiidae	*Eviota melasma*	LC
Perciformes	Gobiidae	*Eviota monostigma*	LC
Perciformes	Gobiidae	*Eviota nebulosa*	LC
Perciformes	Gobiidae	*Eviota occasa*	LC
Perciformes	Gobiidae	*Eviota pellucida*	LC
Perciformes	Gobiidae	*Eviota pinocchioi*	LC
Perciformes	Gobiidae	*Eviota piperata*	LC
Perciformes	Gobiidae	*Eviota prasina*	LC
Perciformes	Gobiidae	*Eviota prasites*	LC
Perciformes	Gobiidae	*Eviota punctulata*	LC
Perciformes	Gobiidae	*Eviota queenslandica*	LC
Perciformes	Gobiidae	*Eviota saipanensis*	LC
Perciformes	Gobiidae	*Eviota shimadai*	LC
Perciformes	Gobiidae	*Eviota sigillata*	LC
Perciformes	Gobiidae	*Eviota smaragdus*	LC
Perciformes	Gobiidae	*Eviota sparsa*	LC
Perciformes	Gobiidae	*Eviota storthynx*	LC

Order	Family	Species	Category Criteria
Perciformes	Gobiidae	*Eviota winterbottomi*	LC
Perciformes	Gobiidae	*Eviota zebrina*	LC
Perciformes	Gobiidae	*Eviota zonura*	LC
Perciformes	Gobiidae	*Exyrias belissimus*	LC
Perciformes	Gobiidae	*Exyrias puntang*	LC
Perciformes	Gobiidae	*Favonigobius melanobranchus*	NT
Perciformes	Gobiidae	*Favonigobius reichei*	NT
Perciformes	Gobiidae	*Feia nympha*	LC
Perciformes	Gobiidae	*Fusigobius duospilus*	LC
Perciformes	Gobiidae	*Fusigobius humeralis*	LC
Perciformes	Gobiidae	*Fusigobius maximus*	LC
Perciformes	Gobiidae	*Fusigobius neophytus*	LC
Perciformes	Gobiidae	*Fusigobius pallidus*	LC
Perciformes	Gobiidae	*Gladiogobius brevispinis*	LC
Perciformes	Gobiidae	*Glossogobius bicirrhosus*	LC
Perciformes	Gobiidae	*Glossogobius giuris*	LC
Perciformes	Gobiidae	*Gnatholepis cauerensis*	LC
Perciformes	Gobiidae	*Gnatholepis ophthalmotaenia*	LC
Perciformes	Gobiidae	*Gobiodon histrio*	LC
Perciformes	Gobiidae	*Gobiopsis exigua*	LC
Perciformes	Gobiidae	*Gobiopsis quinquecincta*	LC
Perciformes	Gobiidae	*Istigobius rigilius*	LC
Perciformes	Gobiidae	*Istigobius spence*	LC
Perciformes	Gobiidae	*Kelloggella quindecimfasciata*	LC
Perciformes	Gobiidae	*Koumansetta hectori*	LC
Perciformes	Gobiidae	*Koumansetta rainfordi*	LC
Perciformes	Gobiidae	*Lotilia klausewitzi*	LC
Perciformes	Gobiidae	*Luposicya lupus*	LC
Perciformes	Gobiidae	*Macrodontogobius wilburi*	LC
Perciformes	Gobiidae	*Mahidolia mystacina*	LC
Perciformes	Gobiidae	*Mugilogobius cavifrons*	LC
Perciformes	Gobiidae	*Oligolepis acutipennis*	DD
Perciformes	Gobiidae	*Oxyurichthys lonchotus*	LC
Perciformes	Gobiidae	*Oxyurichthys microlepis*	LC
Perciformes	Gobiidae	*Oxyurichthys ophthalmonema*	LC
Perciformes	Gobiidae	*Oxyurichthys takagi*	LC
Perciformes	Gobiidae	*Oxyurichthys tentacularis*	DD
Perciformes	Gobiidae	*Palutrus pruinosa*	LC
Perciformes	Gobiidae	*Palutrus scapulopunctatus*	LC
Perciformes	Gobiidae	*Paragobiodon echinocephalus*	LC
Perciformes	Gobiidae	*Paragobiodon lacunicolus*	LC
Perciformes	Gobiidae	*Paragobiodon melanosomus*	LC
Perciformes	Gobiidae	*Paragobiodon modestus*	LC

Order	Family	Species	Category	Criteria
Perciformes	Gobiidae	*Paragobiodon xanthosomus*	LC	
Perciformes	Gobiidae	*Paratrypauchen microcephalus*	LC	
Perciformes	Gobiidae	*Pleurosicya australis*	LC	
Perciformes	Gobiidae	*Pleurosicya bilobata*	LC	
Perciformes	Gobiidae	*Pleurosicya coerulea*	LC	
Perciformes	Gobiidae	*Pleurosicya fringilla*	LC	
Perciformes	Gobiidae	*Pleurosicya labiata*	LC	
Perciformes	Gobiidae	*Pleurosicya micheli*	LC	
Perciformes	Gobiidae	*Pleurosicya mossambica*	LC	
Perciformes	Gobiidae	*Pleurosicya muscarum*	LC	
Perciformes	Gobiidae	*Pleurosicya plicata*	LC	
Perciformes	Gobiidae	*Priolepis akihitoi*	DD	
Perciformes	Gobiidae	*Priolepis compita*	LC	
Perciformes	Gobiidae	*Priolepis inhaca*	LC	
Perciformes	Gobiidae	*Priolepis kappa*	LC	
Perciformes	Gobiidae	*Priolepis nocturna*	LC	
Perciformes	Gobiidae	*Priolepis semidoliata*	LC	
Perciformes	Gobiidae	*Psammogobius biocellatus*	LC	
Perciformes	Gobiidae	*Pseudogobius poicilosoma*	LC	
Perciformes	Gobiidae	*Redigobius balteatus*	LC	
Perciformes	Gobiidae	*Redigobius bikolanus*	LC	
Perciformes	Gobiidae	*Redigobius chrysosoma*	LC	
Perciformes	Gobiidae	*Sicyopterus eudentatus*	EN	B1ab(ii,iii,iv)
Perciformes	Gobiidae	*Sicyopterus lagocephalus*	LC	
Perciformes	Gobiidae	*Sicyopterus lividus*	LC	
Perciformes	Gobiidae	*Sicyopterus stimpsoni*	NT	
Perciformes	Gobiidae	*Sicyopus nigriradiatus*	LC	
Perciformes	Gobiidae	*Stenogobius fehlmanni*	LC	
Perciformes	Gobiidae	*Stiphodon caeruleus*	LC	
Perciformes	Gobiidae	*Stiphodon pelewensis*	DD	
Perciformes	Gobiidae	*Stiphodon percnopterygionus*	DD	
Perciformes	Gobiidae	*Sueviota lachneri*	LC	
Perciformes	Gobiidae	*Taenioides cirratus*	DD	
Perciformes	Gobiidae	*Tomiyamichthys alleni*	DD	
Perciformes	Gobiidae	*Trimma anaima*	LC	
Perciformes	Gobiidae	*Trimma annosum*	LC	
Perciformes	Gobiidae	*Trimma benjamini*	LC	
Perciformes	Gobiidae	*Trimma cana*	LC	
Perciformes	Gobiidae	*Trimma capostriatum*	LC	
Perciformes	Gobiidae	*Trimma caudipunctatum*	DD	
Perciformes	Gobiidae	*Trimma cheni*	LC	
Perciformes	Gobiidae	*Trimma emeryi*	LC	
Perciformes	Gobiidae	*Trimma fangi*	LC	

Order	Family	Species	Category Criteria
Perciformes	Gobiidae	*Trimma flavatrum*	LC
Perciformes	Gobiidae	*Trimma haimassum*	LC
Perciformes	Gobiidae	*Trimma halonevum*	LC
Perciformes	Gobiidae	*Trimma hayashii*	LC
Perciformes	Gobiidae	*Trimma hoesei*	LC
Perciformes	Gobiidae	*Trimma lantana*	LC
Perciformes	Gobiidae	*Trimma macrophthalmum*	LC
Perciformes	Gobiidae	*Trimma maiandros*	LC
Perciformes	Gobiidae	*Trimma milta*	LC
Perciformes	Gobiidae	*Trimma nasa*	LC
Perciformes	Gobiidae	*Trimma nomurai*	LC
Perciformes	Gobiidae	*Trimma okinawae*	LC
Perciformes	Gobiidae	*Trimma preclarum*	LC
Perciformes	Gobiidae	*Trimma randalli*	LC
Perciformes	Gobiidae	*Trimma stobbsi*	LC
Perciformes	Gobiidae	*Trimma striatum*	LC
Perciformes	Gobiidae	*Trimma taylori*	LC
Perciformes	Gobiidae	*Trimma tevegae*	LC
Perciformes	Gobiidae	*Trimma unisquamis*	LC
Perciformes	Gobiidae	*Trimmatom nanus*	LC
Perciformes	Gobiidae	*Trypauchenopsis intermedia*	LC
Perciformes	Gobiidae	*Tryssogobius sarah*	LC
Perciformes	Gobiidae	*Valenciennea helsdingenii*	LC
Perciformes	Gobiidae	*Valenciennea parva*	LC
Perciformes	Gobiidae	*Valenciennea puellaris*	LC
Perciformes	Gobiidae	*Vanderhorstia ambanoro*	LC
Perciformes	Gobiidae	*Vanderhorstia ornatissima*	LC
Perciformes	Gobiidae	*Vanderhorstia phaeostictus*	DD
Perciformes	Kraemeriidae	*Gobitrichinotus radiocularis*	LC
Perciformes	Kraemeriidae	*Kraemeria bryani*	LC
Perciformes	Kraemeriidae	*Kraemeria cunicularia*	LC
Perciformes	Kraemeriidae	*Kraemeria samoensis*	LC
Perciformes	Kraemeriidae	*Kraemeria tongaensis*	LC
Perciformes	Lethrinidae	*Gnathodentex aureolineatus*	LC
Perciformes	Lethrinidae	*Gymnocranius audleyi*	LC
Perciformes	Lethrinidae	*Gymnocranius euanus*	LC
Perciformes	Lethrinidae	*Gymnocranius grandoculis*	LC
Perciformes	Lethrinidae	*Gymnocranius griseus*	LC
Perciformes	Lethrinidae	*Gymnocranius microdon*	LC
Perciformes	Lethrinidae	*Gymnocranius oblongus*	DD
Perciformes	Lethrinidae	*Lethrinus amboinensis*	LC
Perciformes	Lethrinidae	*Lethrinus atkinsoni*	LC
Perciformes	Lethrinidae	*Lethrinus erythracanthus*	LC

Order	Family	Species	Category Criteria
Perciformes	Lethrinidae	*Lethrinus erythropterus*	LC
Perciformes	Lethrinidae	*Lethrinus genivittatus*	LC
Perciformes	Lethrinidae	*Lethrinus harak*	LC
Perciformes	Lethrinidae	*Lethrinus laticaudis*	LC
Perciformes	Lethrinidae	*Lethrinus lentjan*	LC
Perciformes	Lethrinidae	*Lethrinus microdon*	LC
Perciformes	Lethrinidae	*Lethrinus miniatus*	LC
Perciformes	Lethrinidae	*Lethrinus nebulosus*	LC
Perciformes	Lethrinidae	*Lethrinus obsoletus*	LC
Perciformes	Lethrinidae	*Lethrinus olivaceus*	LC
Perciformes	Lethrinidae	*Lethrinus ornatus*	LC
Perciformes	Lethrinidae	*Lethrinus ravus*	LC
Perciformes	Lethrinidae	*Lethrinus rubrioperculatus*	LC
Perciformes	Lethrinidae	*Lethrinus semicinctus*	LC
Perciformes	Lethrinidae	*Lethrinus variegatus*	LC
Perciformes	Lethrinidae	*Lethrinus xanthochilus*	LC
Perciformes	Lethrinidae	*Monotaxis grandoculis*	LC
Perciformes	Lethrinidae	*Monotaxis heterodon*	LC
Perciformes	Lethrinidae	*Wattsia mossambica*	LC
Perciformes	Lutjanidae	*Aphareus furca*	LC
Perciformes	Lutjanidae	*Aphareus rutilans*	LC
Perciformes	Lutjanidae	*Aprion virescens*	LC
Perciformes	Lutjanidae	*Etelis carbunculus*	DD
Perciformes	Lutjanidae	*Etelis carbunculus*	LC
Perciformes	Lutjanidae	*Etelis coruscans*	LC
Perciformes	Lutjanidae	*Etelis radiosus*	LC
Perciformes	Lutjanidae	*Lipochelis carnolabrum*	LC
Perciformes	Lutjanidae	*Lutjanus adetii*	LC
Perciformes	Lutjanidae	*Lutjanus argentimaculatus*	LC
Perciformes	Lutjanidae	*Lutjanus biguttatus*	LC
Perciformes	Lutjanidae	*Lutjanus bohar*	LC
Perciformes	Lutjanidae	*Lutjanus boutton*	LC
Perciformes	Lutjanidae	*Lutjanus decussatus*	LC
Perciformes	Lutjanidae	*Lutjanus ehrenbergii*	LC
Perciformes	Lutjanidae	*Lutjanus fulviflamma*	LC
Perciformes	Lutjanidae	*Lutjanus fulvus*	LC
Perciformes	Lutjanidae	*Lutjanus gibbus*	LC
Perciformes	Lutjanidae	*Lutjanus johnii*	LC
Perciformes	Lutjanidae	*Lutjanus kasmira*	LC
Perciformes	Lutjanidae	*Lutjanus lunulatus*	LC
Perciformes	Lutjanidae	*Lutjanus lutjanus*	LC
Perciformes	Lutjanidae	*Lutjanus mizenkoi*	LC
Perciformes	Lutjanidae	*Lutjanus monostigma*	LC

Order	Family	Species	Category Criteria
Perciformes	Lutjanidae	*Lutjanus papuensis*	DD
Perciformes	Lutjanidae	*Lutjanus quinquelineatus*	LC
Perciformes	Lutjanidae	*Lutjanus rivulatus*	LC
Perciformes	Lutjanidae	*Lutjanus rufolineatus*	LC
Perciformes	Lutjanidae	*Lutjanus russellii*	LC
Perciformes	Lutjanidae	*Lutjanus sebae*	LC
Perciformes	Lutjanidae	*Lutjanus semicinctus*	LC
Perciformes	Lutjanidae	*Lutjanus timorensis*	LC
Perciformes	Lutjanidae	*Lutjanus vitta*	LC
Perciformes	Lutjanidae	*Macolor macularis*	LC
Perciformes	Lutjanidae	*Macolor niger*	LC
Perciformes	Lutjanidae	*Paracaesio gonzalesi*	LC
Perciformes	Lutjanidae	*Paracaesio kusakarii*	LC
Perciformes	Lutjanidae	*Paracaesio paragrapsimodon*	DD
Perciformes	Lutjanidae	*Paracaesio sordida*	LC
Perciformes	Lutjanidae	*Paracaesio stonei*	LC
Perciformes	Lutjanidae	*Paracaesio xanthura*	LC
Perciformes	Lutjanidae	*Parapristipomoides squamimaxillaris*	LC
Perciformes	Lutjanidae	*Pinjalo lewisi*	LC
Perciformes	Lutjanidae	*Pristipomoides argyrogrammicus*	LC
Perciformes	Lutjanidae	*Pristipomoides auricilla*	LC
Perciformes	Lutjanidae	*Pristipomoides filamentosus*	LC
Perciformes	Lutjanidae	*Pristipomoides flavipinnis*	LC
Perciformes	Lutjanidae	*Pristipomoides multidens*	LC
Perciformes	Lutjanidae	*Pristipomoides sieboldii*	LC
Perciformes	Lutjanidae	*Pristipomoides typus*	LC
Perciformes	Lutjanidae	*Pristipomoides zonatus*	LC
Perciformes	Lutjanidae	*Randallichthys filamentosus*	LC
Perciformes	Lutjanidae	*Symphorichthys spilurus*	LC
Perciformes	Lutjanidae	*Symphorus nematophorus*	LC
Perciformes	Microdesmidae	*Gunnellichthys curiosus*	LC
Perciformes	Microdesmidae	*Gunnellichthys grandoculis*	DD
Perciformes	Microdesmidae	*Gunnellichthys monostigma*	LC
Perciformes	Microdesmidae	*Gunnellichthys pleurotaenia*	LC
Perciformes	Microdesmidae	*Gunnellichthys viridescens*	LC
Perciformes	Microdesmidae	*Nemateleotris decora*	LC
Perciformes	Microdesmidae	*Nemateleotris helfrichi*	LC
Perciformes	Microdesmidae	*Nemateleotris magnifica*	LC
Perciformes	Microdesmidae	*Paragunnellichthys seychellensis*	LC
Perciformes	Microdesmidae	*Parioglossus formosus*	LC
Perciformes	Microdesmidae	*Parioglossus lineatus*	DD
Perciformes	Microdesmidae	*Parioglossus neocaledonicus*	DD
Perciformes	Microdesmidae	*Parioglossus nudus*	LC

Order	Family	Species	Category Criteria
Perciformes	Microdesmidae	*Parioglossus palustris*	LC
Perciformes	Microdesmidae	*Parioglossus philippinus*	LC
Perciformes	Microdesmidae	*Parioglossus rainfordi*	LC
Perciformes	Microdesmidae	*Parioglossus raoi*	LC
Perciformes	Microdesmidae	*Parioglossus taeniatus*	LC
Perciformes	Microdesmidae	*Parioglossus triquetrus*	DD
Perciformes	Microdesmidae	*Parioglossus verticalis*	DD
Perciformes	Microdesmidae	*Ptereleotris brachyptera*	DD
Perciformes	Microdesmidae	*Ptereleotris evides*	LC
Perciformes	Microdesmidae	*Ptereleotris grammica*	LC
Perciformes	Microdesmidae	*Ptereleotris hanae*	LC
Perciformes	Microdesmidae	*Ptereleotris heteroptera*	LC
Perciformes	Microdesmidae	*Ptereleotris lineopinnis*	DD
Perciformes	Microdesmidae	*Ptereleotris melanopogon*	LC
Perciformes	Microdesmidae	*Ptereleotris monoptera*	LC
Perciformes	Microdesmidae	*Ptereleotris uroditaenia*	LC
Perciformes	Microdesmidae	*Ptereleotris zebra*	LC
Perciformes	Mullidae	*Mulloidichthys flavolineatus*	LC
Perciformes	Mullidae	*Mulloidichthys mimicus*	LC
Perciformes	Mullidae	*Mulloidichthys pfluegeri*	LC
Perciformes	Mullidae	*Mulloidichthys vanicolensis*	LC
Perciformes	Mullidae	*Parupeneus barberinoides*	LC
Perciformes	Mullidae	*Parupeneus barberinus*	LC
Perciformes	Mullidae	*Parupeneus ciliatus*	LC
Perciformes	Mullidae	*Parupeneus crassilabris*	LC
Perciformes	Mullidae	*Parupeneus cyclostomus*	LC
Perciformes	Mullidae	*Parupeneus heptacanthus*	LC
Perciformes	Mullidae	*Parupeneus indicus*	LC
Perciformes	Mullidae	*Parupeneus insularis*	LC
Perciformes	Mullidae	*Parupeneus jansenii*	LC
Perciformes	Mullidae	*Parupeneus louise*	LC
Perciformes	Mullidae	*Parupeneus macronemus*	LC
Perciformes	Mullidae	*Parupeneus moffitti*	DD
Perciformes	Mullidae	*Parupeneus multifasciatus*	LC
Perciformes	Mullidae	*Parupeneus pleurostigma*	LC
Perciformes	Mullidae	*Parupeneus spilurus*	LC
Perciformes	Mullidae	*Upeneichthys lineatus*	LC
Perciformes	Mullidae	*Upeneus australiae*	LC
Perciformes	Mullidae	*Upeneus francisi*	LC
Perciformes	Mullidae	*Upeneus moluccensis*	LC
Perciformes	Mullidae	*Upeneus mouthami*	DD
Perciformes	Mullidae	*Upeneus sulphureus*	LC
Perciformes	Mullidae	*Upeneus sundaicus*	LC

Order	Family	Species	Category Criteria
Perciformes	Mullidae	*Upeneus taeniopterus*	LC
Perciformes	Mullidae	*Upeneus tragula*	LC
Perciformes	Mullidae	*Upeneus vanuatu*	DD
Perciformes	Mullidae	*Upeneus vittatus*	LC
Perciformes	Nemipteridae	*Nemipterus balinensoides*	LC
Perciformes	Nemipteridae	*Nemipterus furcosus*	DD
Perciformes	Nemipteridae	*Nemipterus hexodon*	LC
Perciformes	Nemipteridae	*Nemipterus peronii*	LC
Perciformes	Nemipteridae	*Nemipterus vitiensis*	LC
Perciformes	Nemipteridae	*Nemipterus zysron*	LC
Perciformes	Nemipteridae	*Pentapodus aureofasciatus*	LC
Perciformes	Nemipteridae	*Pentapodus caninus*	LC
Perciformes	Nemipteridae	*Pentapodus nagasakiensis*	LC
Perciformes	Nemipteridae	*Pentapodus trivittatus*	LC
Perciformes	Nemipteridae	*Scolopsis affinis*	LC
Perciformes	Nemipteridae	*Scolopsis bilineata*	LC
Perciformes	Nemipteridae	*Scolopsis ciliata*	LC
Perciformes	Nemipteridae	*Scolopsis lineata*	LC
Perciformes	Nemipteridae	*Scolopsis margaritifera*	LC
Perciformes	Nemipteridae	*Scolopsis monogramma*	LC
Perciformes	Nemipteridae	*Scolopsis taenioptera*	DD
Perciformes	Nemipteridae	*Scolopsis temporalis*	LC
Perciformes	Nemipteridae	*Scolopsis trilineata*	LC
Perciformes	Opisthognathidae	*Opistognathus solorensis*	LC
Perciformes	Opisthognathidae	*Opistognathus variabilis*	LC
Perciformes	Percophidae	*Pteropsaron longipinnis*	LC
Perciformes	Percophidae	*Pteropsaron springeri*	LC
Perciformes	Priacanthidae	*Cookeolus japonicus*	LC
Perciformes	Priacanthidae	*Heteropriacanthus cruentatus*	LC
Perciformes	Priacanthidae	*Priacanthus blochii*	LC
Perciformes	Priacanthidae	*Priacanthus hamrur*	LC
Perciformes	Priacanthidae	*Priacanthus macracanthus*	LC
Perciformes	Priacanthidae	*Priacanthus sagittarius*	LC
Perciformes	Priacanthidae	*Priacanthus tayenus*	LC
Perciformes	Priacanthidae	*Pristigenys meyeri*	LC
Perciformes	Priacanthidae	*Pristigenys niphonia*	LC
Perciformes	Priacanthidae	*Pristigenys refulgens*	LC
Perciformes	Pseudochromidae	*Amsichthys knighti*	LC
Perciformes	Pseudochromidae	*Cypho purpurascens*	LC
Perciformes	Pseudochromidae	*Lubbockichthys multisquamatus*	LC
Perciformes	Pseudochromidae	*Lubbockichthys myersi*	DD
Perciformes	Pseudochromidae	*Manonichthys polynemus*	DD
Perciformes	Pseudochromidae	*Ogilbyina salvati*	LC

Order	Family	Species	Category Criteria
Perciformes	Pseudochromidae	*Pictichromis paccagnellae*	LC
Perciformes	Pseudochromidae	*Pictichromis porphyrea*	LC
Perciformes	Pseudochromidae	*Pseudochromis bitaeniatus*	LC
Perciformes	Pseudochromidae	*Pseudochromis cyanotaenia*	LC
Perciformes	Pseudochromidae	*Pseudochromis fuscus*	LC
Perciformes	Pseudochromidae	*Pseudochromis jamesi*	LC
Perciformes	Pseudochromidae	*Pseudochromis kolythrus*	DD
Perciformes	Pseudochromidae	*Pseudochromis marshallensis*	LC
Perciformes	Pseudochromidae	*Pseudochromis melanurus*	LC
Perciformes	Pseudochromidae	*Pseudochromis pylei*	DD
Perciformes	Pseudochromidae	*Pseudochromis tapeinosoma*	LC
Perciformes	Pseudochromidae	*Pseudoplesiops annae*	LC
Perciformes	Pseudochromidae	*Pseudoplesiops howensis*	LC
Perciformes	Pseudochromidae	*Pseudoplesiops revellei*	LC
Perciformes	Pseudochromidae	*Pseudoplesiops rosae*	LC
Perciformes	Pseudochromidae	*Pseudoplesiops typus*	LC
Perciformes	Pseudochromidae	*Pseudoplesiops wassi*	LC
Perciformes	Serranidae	*Acanthistius cinctus*	LC
Perciformes	Serranidae	*Aporops bilinearis*	LC
Perciformes	Serranidae	*Aulacocephalus temminckii*	LC
Perciformes	Serranidae	*Belonoperca chabanaudi*	LC
Perciformes	Serranidae	*Belonoperca pylei*	LC
Perciformes	Serranidae	*Caprodon longimanus*	LC
Perciformes	Serranidae	*Caprodon schlegelii*	LC
Perciformes	Serranidae	*Diploprion bifasciatum*	LC
Perciformes	Serranidae	*Grammistes sexlineatus*	LC
Perciformes	Serranidae	*Grammistops ocellatus*	LC
Perciformes	Serranidae	*Liopropoma collettei*	LC
Perciformes	Serranidae	*Liopropoma erythraeum*	LC
Perciformes	Serranidae	*Liopropoma flavidum*	LC
Perciformes	Serranidae	*Liopropoma latifasciatum*	LC
Perciformes	Serranidae	*Liopropoma lemniscatum*	LC
Perciformes	Serranidae	*Liopropoma lunulatum*	LC
Perciformes	Serranidae	*Liopropoma maculatum*	LC
Perciformes	Serranidae	*Liopropoma mitratum*	LC
Perciformes	Serranidae	*Liopropoma multilineatum*	LC
Perciformes	Serranidae	*Liopropoma pallidum*	LC
Perciformes	Serranidae	*Liopropoma susumi*	LC
Perciformes	Serranidae	*Liopropoma swalesi*	LC
Perciformes	Serranidae	*Liopropoma tonstrinum*	LC
Perciformes	Serranidae	*Luzonichthys earlei*	LC
Perciformes	Serranidae	*Luzonichthys waitei*	LC
Perciformes	Serranidae	*Luzonichthys whitleyi*	LC

Order	Family	Species	Category Criteria
Perciformes	Serranidae	*Luzonichthys williamsi*	LC
Perciformes	Serranidae	*Odontanthias borbonius*	LC
Perciformes	Serranidae	*Odontanthias katayamai*	LC
Perciformes	Serranidae	*Odontanthias tapui*	LC
Perciformes	Serranidae	*Plectranthias cirrhitoides*	LC
Perciformes	Serranidae	*Plectranthias fijiensis*	DD
Perciformes	Serranidae	*Plectranthias flammeus*	LC
Perciformes	Serranidae	*Plectranthias fourmanoiri*	LC
Perciformes	Serranidae	*Plectranthias inermis*	LC
Perciformes	Serranidae	*Plectranthias kamii*	LC
Perciformes	Serranidae	*Plectranthias kelloggi*	LC
Perciformes	Serranidae	*Plectranthias longimanus*	LC
Perciformes	Serranidae	*Plectranthias megalophthalmus*	LC
Perciformes	Serranidae	*Plectranthias nanus*	LC
Perciformes	Serranidae	*Plectranthias randalli*	LC
Perciformes	Serranidae	*Plectranthias retrofasciatus*	LC
Perciformes	Serranidae	*Plectranthias rubrifasciatus*	LC
Perciformes	Serranidae	*Plectranthias taylori*	LC
Perciformes	Serranidae	*Plectranthias winniensis*	LC
Perciformes	Serranidae	*Plectranthias yamakawai*	LC
Perciformes	Serranidae	*Pogonoperca punctata*	LC
Perciformes	Serranidae	*Pseudanthias aurulentus*	LC
Perciformes	Serranidae	*Pseudanthias bartlettorum*	LC
Perciformes	Serranidae	*Pseudanthias bicolor*	LC
Perciformes	Serranidae	*Pseudanthias calloura*	LC
Perciformes	Serranidae	*Pseudanthias cooperi*	LC
Perciformes	Serranidae	*Pseudanthias dispar*	LC
Perciformes	Serranidae	*Pseudanthias engelhardi*	LC
Perciformes	Serranidae	*Pseudanthias flavicauda*	LC
Perciformes	Serranidae	*Pseudanthias flavoguttatus*	LC
Perciformes	Serranidae	*Pseudanthias gibbosus*	LC
Perciformes	Serranidae	*Pseudanthias hiva*	LC
Perciformes	Serranidae	*Pseudanthias huchtii*	LC
Perciformes	Serranidae	*Pseudanthias hypselosoma*	LC
Perciformes	Serranidae	*Pseudanthias lori*	LC
Perciformes	Serranidae	*Pseudanthias luzonensis*	LC
Perciformes	Serranidae	*Pseudanthias mooreanus*	LC
Perciformes	Serranidae	*Pseudanthias olivaceus*	LC
Perciformes	Serranidae	*Pseudanthias oumati*	LC
Perciformes	Serranidae	*Pseudanthias parvirostris*	LC
Perciformes	Serranidae	*Pseudanthias pascalus*	LC
Perciformes	Serranidae	*Pseudanthias pictilis*	LC
Perciformes	Serranidae	*Pseudanthias pleurotaenia*	LC

Order	Family	Species	Category Criteria
Perciformes	Serranidae	*Pseudanthias privitera*	LC
Perciformes	Serranidae	*Pseudanthias randalli*	LC
Perciformes	Serranidae	*Pseudanthias rubrizonatus*	LC
Perciformes	Serranidae	*Pseudanthias rubrolineatus*	LC
Perciformes	Serranidae	*Pseudanthias smithvanizi*	LC
Perciformes	Serranidae	*Pseudanthias squamipinnis*	LC
Perciformes	Serranidae	*Pseudanthias tuka*	LC
Perciformes	Serranidae	*Pseudanthias ventralis*	LC
Perciformes	Serranidae	*Pseudanthias xanthomaculatus*	DD
Perciformes	Serranidae	*Pseudogramma astigma*	LC
Perciformes	Serranidae	*Pseudogramma pectoralis*	LC
Perciformes	Serranidae	*Pseudogramma polyacantha*	LC
Perciformes	Serranidae	*Pseudogramma xantha*	LC
Perciformes	Serranidae	*Rabaulichthys altipinnis*	LC
Perciformes	Serranidae	*Selenanthias barroi*	LC
Perciformes	Serranidae	*Selenanthias myersi*	LC
Perciformes	Serranidae	*Serranocirrhitus latus*	LC
Perciformes	Serranidae	*Suttonia lineata*	LC
Perciformes	Serranidae	*Trachypoma macracanthus*	LC
Perciformes	Siganidae	*Siganus argenteus*	LC
Perciformes	Siganidae	*Siganus canaliculatus*	LC
Perciformes	Siganidae	*Siganus corallinus*	LC
Perciformes	Siganidae	*Siganus doliatus*	LC
Perciformes	Siganidae	*Siganus fuscescens*	LC
Perciformes	Siganidae	*Siganus guttatus*	LC
Perciformes	Siganidae	*Siganus javus*	LC
Perciformes	Siganidae	*Siganus lineatus*	LC
Perciformes	Siganidae	*Siganus niger*	VU
Perciformes	Siganidae	*Siganus puellus*	LC
Perciformes	Siganidae	*Siganus punctatissimus*	LC
Perciformes	Siganidae	*Siganus punctatus*	LC
Perciformes	Siganidae	*Siganus randalli*	LC
Perciformes	Siganidae	*Siganus spinus*	LC
Perciformes	Siganidae	*Siganus uspi*	NT
Perciformes	Siganidae	*Siganus vermiculatus*	LC
Perciformes	Siganidae	*Siganus vulpinus*	LC
Perciformes	Siganidae	*Siganus woodlandi*	LC
Perciformes	Sillaginidae	*Sillago ciliata*	LC
Perciformes	Sillaginidae	*Sillago sihama*	LC
Perciformes	Trichonotidae	*Trichonotus elegans*	LC
Perciformes	Trichonotidae	*Trichonotus filamentosus*	LC
Perciformes	Trichonotidae	*Trichonotus setiger*	LC
Perciformes	Xenisthmidae	*Allomicrodesmus dorotheae*	DD

Order	Family	Species	Category Criteria
Perciformes	Xenisthmidae	*Paraxenisthmus cerberusi*	DD
Perciformes	Xenisthmidae	*Paraxenisthmus springeri*	DD
Perciformes	Xenisthmidae	*Rotuma lewisi*	LC
Perciformes	Xenisthmidae	*Tyson belos*	LC
Perciformes	Xenisthmidae	*Xenisthmus chapmani*	DD
Perciformes	Xenisthmidae	*Xenisthmus clarus*	LC
Perciformes	Xenisthmidae	*Xenisthmus eirospilus*	LC
Perciformes	Xenisthmidae	*Xenisthmus polyzonatus*	LC
Perciformes	Zanclidae	*Zanclus cornutus*	LC
Pleuronectiformes	Soleidae	*Brachirus sorsogonensis*	DD
Pleuronectiformes	Soleidae	*Pardachirus poropterus*	DD
Pleuronectiformes	Bothidae	*Bothus mancus*	LC
Pleuronectiformes	Bothidae	*Chascanopsetta lugubris*	LC
Pleuronectiformes	Bothidae	*Arnoglossus debilis*	LC
Pleuronectiformes	Bothidae	*Arnoglossus japonicus*	LC
Pleuronectiformes	Bothidae	*Arnoglossus macrolophus*	LC
Pleuronectiformes	Bothidae	*Arnoglossus nigrifrons*	DD
Pleuronectiformes	Bothidae	*Arnoglossus oxyrhynchus*	LC
Pleuronectiformes	Bothidae	*Arnoglossus polyspilus*	LC
Pleuronectiformes	Bothidae	*Arnoglossus septemventralis*	LC
Pleuronectiformes	Bothidae	*Arnoglossus tenuis*	LC
Pleuronectiformes	Bothidae	*Asterorhombus cocosensis*	LC
Pleuronectiformes	Bothidae	*Asterorhombus filifer*	LC
Pleuronectiformes	Bothidae	*Asterorhombus intermedius*	LC
Pleuronectiformes	Bothidae	*Bothus pantherinus*	LC
Pleuronectiformes	Bothidae	*Engyprosopon bellonaensis*	LC
Pleuronectiformes	Bothidae	*Engyprosopon grandisquama*	LC
Pleuronectiformes	Bothidae	*Engyprosopon hureaui*	DD
Pleuronectiformes	Bothidae	*Engyprosopon longipterum*	LC
Pleuronectiformes	Bothidae	*Engyprosopon macrolepis*	LC
Pleuronectiformes	Bothidae	*Engyprosopon maldivensis*	LC
Pleuronectiformes	Bothidae	*Engyprosopon marquisensis*	LC
Pleuronectiformes	Bothidae	*Engyprosopon raoulensis*	LC
Pleuronectiformes	Bothidae	*Engyprosopon rostratum*	LC
Pleuronectiformes	Bothidae	*Engyprosopon septempes*	LC
Pleuronectiformes	Bothidae	*Engyprosopon vanuatuensis*	DD
Pleuronectiformes	Bothidae	*Engyprosopon xystrias*	LC
Pleuronectiformes	Bothidae	*Grammatobothus pennatus*	LC
Pleuronectiformes	Bothidae	*Grammatobothus polyophthalmus*	LC
Pleuronectiformes	Bothidae	*Parabothus coarctatus*	LC
Pleuronectiformes	Bothidae	*Parabothus filipes*	LC
Pleuronectiformes	Bothidae	*Parabothus kiensis*	LC
Pleuronectiformes	Bothidae	*Taeniopsetta ocellata*	LC

Order	Family	Species	Category Criteria
Pleuronectiformes	Bothidae	*Tosarhombus brevis*	LC
Pleuronectiformes	Bothidae	*Tosarhombus neocaledonicus*	LC
Pleuronectiformes	Paralichthyidae	*Pseudorhombus arsius*	LC
Pleuronectiformes	Pleuronectidae	*Peltorhamphus latus*	LC
Pleuronectiformes	Soleidae	*Aseopia cornuta*	LC
Pleuronectiformes	Soleidae	*Aseraggodes auroculus*	DD
Pleuronectiformes	Soleidae	*Aseraggodes bahamondei*	LC
Pleuronectiformes	Soleidae	*Aseraggodes cyclurus*	DD
Pleuronectiformes	Soleidae	*Aseraggodes firmisquamis*	DD
Pleuronectiformes	Soleidae	*Aseraggodes heraldi*	DD
Pleuronectiformes	Soleidae	*Aseraggodes lateralis*	DD
Pleuronectiformes	Soleidae	*Aseraggodes magnoculus*	DD
Pleuronectiformes	Soleidae	*Aseraggodes melanostictus*	LC
Pleuronectiformes	Soleidae	*Aseraggodes ramsaii*	DD
Pleuronectiformes	Soleidae	*Aseraggodes whitakeri*	LC
Pleuronectiformes	Soleidae	*Aseraggodes xenicus*	LC
Pleuronectiformes	Soleidae	*Dexillus muelleri*	LC
Pleuronectiformes	Soleidae	*Pardachirus pavoninus*	LC
Pleuronectiformes	Soleidae	*Pseudoaesopia japonica*	LC
Pleuronectiformes	Soleidae	*Soleichthys heterorhinos*	LC
Tetraodontiformes	Monacanthidae	*Thamnaconus fijiensis*	DD
Tetraodontiformes	Monacanthidae	*Aluterus monoceros*	LC
Tetraodontiformes	Monacanthidae	*Aluterus scriptus*	LC
Tetraodontiformes	Monacanthidae	*Anacanthus barbatus*	LC
Tetraodontiformes	Monacanthidae	*Cantheschenia longipinnis*	LC
Tetraodontiformes	Monacanthidae	*Acreichthys radiatus*	LC
Tetraodontiformes	Monacanthidae	*Acreichthys tomentosus*	LC
Tetraodontiformes	Monacanthidae	*Amanses scopas*	LC
Tetraodontiformes	Monacanthidae	*Arotrolepis filicauda*	LC
Tetraodontiformes	Monacanthidae	*Brachaluteres taylori*	Lc
Tetraodontiformes	Monacanthidae	*Cantherhines dumerilii*	LC
Tetraodontiformes	Monacanthidae	*Cantherhines fronticinctus*	LC
Tetraodontiformes	Monacanthidae	*Cantherhines longicaudus*	DD
Tetraodontiformes	Monacanthidae	*Cantherhines nukuhiva*	DD
Tetraodontiformes	Monacanthidae	*Cantherhines pardalis*	LC
Tetraodontiformes	Monacanthidae	*Cantherhines sandwichiensis*	LC
Tetraodontiformes	Monacanthidae	*Enigmacanthus filamentosus*	DD
Tetraodontiformes	Monacanthidae	*Monacanthus chinensis*	LC
Tetraodontiformes	Monacanthidae	*Oxymonacanthus longirostris*	VU
Tetraodontiformes	Monacanthidae	*Paraluteres prionurus*	LC
Tetraodontiformes	Monacanthidae	*Paramonacanthus choirocephalus*	LC
Tetraodontiformes	Monacanthidae	*Paramonacanthus japonicus*	LC
Tetraodontiformes	Monacanthidae	*Paramonacanthus lowei*	LC

Order	Family	Species	Category Criteria
Tetraodontiformes	Monacanthidae	*Pervagor alternans*	LC
Tetraodontiformes	Monacanthidae	*Pervagor aspricaudus*	LC
Tetraodontiformes	Monacanthidae	*Pervagor janthinosoma*	LC
Tetraodontiformes	Monacanthidae	*Pervagor marginalis*	DD
Tetraodontiformes	Monacanthidae	*Pervagor melanocephalus*	LC
Tetraodontiformes	Monacanthidae	*Pervagor nigrolineatus*	LC
Tetraodontiformes	Monacanthidae	*Pseudalutarius nasicornis*	LC
Tetraodontiformes	Monacanthidae	*Rudarius minutus*	LC
Tetraodontiformes	Monacanthidae	*Thamnaconus modestoides*	LC
Tetraodontiformes	Monacanthidae	*Thamnaconus tessellatus*	LC

Appendix II: Expert participants at the 2015 IUCN Red List workshops in Fiji

Table AII.1: Expert participants at the 2015 IUCN Red List workshops in Fiji, with institutional affiliations and country of residence, organized alphabetically by family name.

Participant Name	Institution	Country
Kent Carpenter	Old Dominion University	USA
David Greenfield	California Academy of Sciences	USA
Michael Harvey	Old Dominion University	USA
Heather Harwell	Christopher Newport University	USA
Helen Larson	Museum and Art Gallery of the Northern Territory	Australia
Alice Lawrence	American Samoa Department of Marine and Wildlife Resources	USA
Keiichi Matsura	National Museum of Nature and Science	Japan
Hiro Motomura	The Kagoshima University Museum	Japan
Tom Munroe	National Marine Fisheries Service	USA
Robert Myers	Coral Graphics	USA
Helen Pippard	IUCN-Oceania	Fiji
Gina Ralph	Old Dominion University	USA
Barry Russell	Museum and Art Gallery of the Northern Territory	Australia
William Smith-Vaniz	Florida Museum of Natural History	USA
Randolph Thaman	University of the South Pacific	Fiji
Ivor Williams	Pacific Islands Fisheries Science Center	USA
Jeffrey Williams	Smithsonian Institution	USA

Appendix III: Threatened marine plants and invertebrates found in the Pacific Islands of Oceania

Table AIII.1: Marine invertebrates and plants found in the Pacific Islands of Oceania that are assessed as threatened (Critically Endangered - CR, Endangered - EN, or Vulnerable - VU) based on the IUCN Red List methodology. Note that criteria are only included for species listed as threatened (i.e., Critically Endangered, Endangered, or Vulnerable).

Taxa	Family	Species	Category	Criteria
Mangroves	Rhizophoraceae	*Bruguiera hainesii*	CR	C1
Fire Corals	Milleporidae	*Millepora tuberosa*	EN	A4c
Hard Corals	Acroporidae	*Acropora rudis*	EN	A4ce
Hard Corals	Acroporidae	*Anacropora spinosa*	EN	A4ce
Hard Corals	Fungiidae	*Cantharellus noumeae*	EN	B2ab(iii)
Hard Corals	Mussidae	*Lobophyllia serratus*	EN	A4c
Hard Corals	Pectiniidae	*Pectinia maxima*	EN	A4cd
Hard Corals	Poritidae	*Alveopora minuta*	EN	A4cd
Hard Corals	Poritidae	*Porites eridani*	EN	A4cde
Sea Cucumbers	Holothuriidae	*Holothuria lessoni*	EN	A2bd
Sea Cucumbers	Holothuriidae	*Holothuria scabra*	EN	A2bd
Sea Cucumbers	Holothuriidae	*Holothuria whitmaei*	EN	A2bd
Sea Cucumbers	Stichopodidae	*Thelenota ananas*	EN	A2bd
Mangroves	Avicenniaceae	*Avicennia rumphiana*	VU	A2c
Fire Corals	Milleporidae	*Millepora foveolata*	VU	A4cde
Hard Corals	Helioporidae	*Heliopora coerulea*	VU	A4cde
Hard Corals	Acroporidae	*Acropora abrolhosensis*	VU	A4cde
Hard Corals	Acroporidae	*Acropora aculeus*	VU	A4ce
Hard Corals	Acroporidae	*Acropora acuminata*	VU	A4ce
Hard Corals	Acroporidae	*Acropora anthocercis*	VU	A4ce
Hard Corals	Acroporidae	*Acropora aspera*	VU	A4ce
Hard Corals	Acroporidae	*Acropora awi*	VU	A4ce
Hard Corals	Acroporidae	*Acropora batunai*	VU	A4ce
Hard Corals	Acroporidae	*Acropora caroliniana*	VU	A4ce
Hard Corals	Acroporidae	*Acropora dendrum*	VU	A4ce
Hard Corals	Acroporidae	*Acropora derawanensis*	VU	A4ce
Hard Corals	Acroporidae	*Acropora desalwii*	VU	A4ce
Hard Corals	Acroporidae	*Acropora donei*	VU	A4ce
Hard Corals	Acroporidae	*Acropora echinata*	VU	A4cde
Hard Corals	Acroporidae	*Acropora elegans*	VU	A4cde
Hard Corals	Acroporidae	*Acropora globiceps*	VU	A4ce
Hard Corals	Acroporidae	*Acropora hoeksemai*	VU	A4ce
Hard Corals	Acroporidae	*Acropora horrida*	VU	A4cde
Hard Corals	Acroporidae	*Acropora indonesia*	VU	A4ce
Hard Corals	Acroporidae	*Acropora jacquelineae*	VU	A4ce
Hard Corals	Acroporidae	*Acropora kimbeensis*	VU	A4cde
Hard Corals	Acroporidae	*Acropora kirstyae*	VU	A4ce
Hard Corals	Acroporidae	*Acropora listeri*	VU	A4ce

Taxa	Family	Species	Category	Criteria
Hard Corals	Acroporidae	*Acropora loisetteae*	VU	A4ce
Hard Corals	Acroporidae	*Acropora lokani*	VU	A4ce
Hard Corals	Acroporidae	*Acropora lovelli*	VU	A4ce
Hard Corals	Acroporidae	*Acropora microclados*	VU	A4ce
Hard Corals	Acroporidae	*Acropora multiacuta*	VU	A4ce
Hard Corals	Acroporidae	*Acropora palmerae*	VU	A4ce
Hard Corals	Acroporidae	*Acropora paniculata*	VU	A4ce
Hard Corals	Acroporidae	*Acropora pharaonis*	VU	A4ce
Hard Corals	Acroporidae	*Acropora plumosa*	VU	A4ce
Hard Corals	Acroporidae	*Acropora polystoma*	VU	A4ce
Hard Corals	Acroporidae	*Acropora retusa*	VU	A4ce
Hard Corals	Acroporidae	*Acropora simplex*	VU	A4ce
Hard Corals	Acroporidae	*Acropora solitaryensis*	VU	A4ce
Hard Corals	Acroporidae	*Acropora speciosa*	VU	A4ce
Hard Corals	Acroporidae	*Acropora spicifera*	VU	A4ce
Hard Corals	Acroporidae	*Acropora striata*	VU	A4ce
Hard Corals	Acroporidae	*Acropora tenella*	VU	A4ce
Hard Corals	Acroporidae	*Acropora turaki*	VU	A4ce
Hard Corals	Acroporidae	*Acropora vaughani*	VU	A4ce
Hard Corals	Acroporidae	*Acropora verweyi*	VU	A4ce
Hard Corals	Acroporidae	*Acropora walindii*	VU	A4ce
Hard Corals	Acroporidae	*Acropora willisae*	VU	A4ce
Hard Corals	Acroporidae	*Anacropora matthai*	VU	A4c
Hard Corals	Acroporidae	*Anacropora puertogalerae*	VU	A4ce
Hard Corals	Acroporidae	*Anacropora reticulata*	VU	A4ce
Hard Corals	Acroporidae	*Astreopora cucullata*	VU	A4ce
Hard Corals	Acroporidae	*Astreopora incrustans*	VU	A4ce
Hard Corals	Acroporidae	*Astreopora moretonensis*	VU	A4ce
Hard Corals	Acroporidae	*Isopora brueggemanni*	VU	A4ce
Hard Corals	Acroporidae	*Isopora crateriformis*	VU	A4ce
Hard Corals	Acroporidae	*Isopora cuneata*	VU	A4ce
Hard Corals	Acroporidae	*Montipora altasepta*	VU	A4cde
Hard Corals	Acroporidae	*Montipora angulata*	VU	A4ce
Hard Corals	Acroporidae	*Montipora australiensis*	VU	A4ce
Hard Corals	Acroporidae	*Montipora cactus*	VU	A4ce
Hard Corals	Acroporidae	*Montipora calcarea*	VU	A4ce
Hard Corals	Acroporidae	*Montipora caliculata*	VU	A4ce
Hard Corals	Acroporidae	*Montipora capricornis*	VU	A4ce
Hard Corals	Acroporidae	*Montipora cebuensis*	VU	A4ce
Hard Corals	Acroporidae	*Montipora cocosensis*	VU	A4ce
Hard Corals	Acroporidae	*Montipora corbettensis*	VU	A4c
Hard Corals	Acroporidae	*Montipora crassituberculata*	VU	A4c
Hard Corals	Acroporidae	*Montipora delicatula*	VU	A4ce

Taxa	Family	Species	Category	Criteria
Hard Corals	Acroporidae	*Montipora florida*	VU	A4c
Hard Corals	Acroporidae	*Montipora friabilis*	VU	A4ce
Hard Corals	Acroporidae	*Montipora gaimardi*	VU	A4c
Hard Corals	Acroporidae	*Montipora hodgsoni*	VU	A4c
Hard Corals	Acroporidae	*Montipora lobulata*	VU	A4c
Hard Corals	Acroporidae	*Montipora mactanensis*	VU	A4c
Hard Corals	Acroporidae	*Montipora malampaya*	VU	A4c
Hard Corals	Acroporidae	*Montipora meandrina*	VU	A4c
Hard Corals	Acroporidae	*Montipora orientalis*	VU	A4c
Hard Corals	Acroporidae	*Montipora samarensis*	VU	A4c
Hard Corals	Acroporidae	*Montipora turtlensis*	VU	A4c
Hard Corals	Acroporidae	*Montipora verruculosus*	VU	A4c
Hard Corals	Acroporidae	*Montipora vietnamensis*	VU	A4c
Hard Corals	Agariciidae	*Leptoseris incrustans*	VU	A4ce
Hard Corals	Agariciidae	*Leptoseris yabei*	VU	A4ce
Hard Corals	Agariciidae	*Pachyseris involuta*	VU	A4ce
Hard Corals	Agariciidae	*Pachyseris rugosa*	VU	A4cd
Hard Corals	Agariciidae	*Pavona bipartita*	VU	A4c
Hard Corals	Agariciidae	*Pavona cactus*	VU	A4cd
Hard Corals	Agariciidae	*Pavona decussata*	VU	A4c
Hard Corals	Agariciidae	*Pavona diffluens*	VU	A4c
Hard Corals	Agariciidae	*Pavona venosa*	VU	A4c
Hard Corals	Astrocoeniidae	*Stylocoeniella cocosensis*	VU	A4c
Hard Corals	Dendrophylliidae	*Turbinaria bifrons*	VU	A4c
Hard Corals	Dendrophylliidae	*Turbinaria heronensis*	VU	A4c
Hard Corals	Dendrophylliidae	*Turbinaria mesenterina*	VU	A4cd
Hard Corals	Dendrophylliidae	*Turbinaria patula*	VU	A4c
Hard Corals	Dendrophylliidae	*Turbinaria peltata*	VU	A4cd
Hard Corals	Dendrophylliidae	*Turbinaria reniformis*	VU	A4c
Hard Corals	Dendrophylliidae	*Turbinaria stellulata*	VU	A4c
Hard Corals	Euphyllidae	*Catalaphyllia jardinei*	VU	A4cd
Hard Corals	Euphyllidae	*Euphyllia ancora*	VU	A4cd
Hard Corals	Euphyllidae	*Euphyllia cristata*	VU	A4cd
Hard Corals	Euphyllidae	*Euphyllia paraancora*	VU	A4cd
Hard Corals	Euphyllidae	*Euphyllia paradivisa*	VU	A4cd
Hard Corals	Euphyllidae	*Euphyllia paraglabrescens*	VU	A4c
Hard Corals	Euphyllidae	*Nemenzophyllia turbida*	VU	A4cd
Hard Corals	Euphyllidae	*Physogyra lichtensteini*	VU	A4cd
Hard Corals	Euphyllidae	*Plerogyra discus*	VU	A4c
Hard Corals	Faviidae	*Australogyra zelli*	VU	A4c
Hard Corals	Faviidae	*Barabattoia laddi*	VU	A4c
Hard Corals	Faviidae	*Caulastrea curvata*	VU	A4cd
Hard Corals	Faviidae	*Caulastrea echinulata*	VU	A4cd

Taxa	Family	Species	Category	Criteria
Hard Corals	Faviidae	*Cyphastrea agassizi*	VU	A4c
Hard Corals	Faviidae	*Cyphastrea ocellina*	VU	A4c
Hard Corals	Faviidae	*Favia rosaria*	VU	A4c
Hard Corals	Faviidae	*Favites spinosa*	VU	A4c
Hard Corals	Faviidae	*Goniastrea ramosa*	VU	A4c
Hard Corals	Faviidae	*Leptastrea aequalis*	VU	A4c
Hard Corals	Faviidae	*Leptoria irregularis*	VU	A4c
Hard Corals	Faviidae	*Montastrea multipunctata*	VU	A4c
Hard Corals	Faviidae	*Montastrea salebrosa*	VU	A4c
Hard Corals	Faviidae	*Moseleya latistellata*	VU	A4c
Hard Corals	Faviidae	*Platygyra yaeyamaensis*	VU	A4c
Hard Corals	Fungiidae	*Fungia curvata*	VU	A4c
Hard Corals	Fungiidae	*Halomitra clavator*	VU	A4c
Hard Corals	Fungiidae	*Heliofungia actiniformis*	VU	A4cd
Hard Corals	Mussidae	*Acanthastrea bowerbanki*	VU	A4ce
Hard Corals	Mussidae	*Acanthastrea brevis*	VU	A4ce
Hard Corals	Mussidae	*Acanthastrea faviaformis*	VU	A4c
Hard Corals	Mussidae	*Acanthastrea hemprichii*	VU	A4c
Hard Corals	Mussidae	*Acanthastrea ishigakiensis*	VU	A4c
Hard Corals	Mussidae	*Acanthastrea regularis*	VU	A4c
Hard Corals	Mussidae	*Lobophyllia dentatus*	VU	A4c
Hard Corals	Mussidae	*Lobophyllia diminuta*	VU	A4ce
Hard Corals	Mussidae	*Lobophyllia flabelliformis*	VU	A4ce
Hard Corals	Mussidae	*Symphyllia hassi*	VU	A4c
Hard Corals	Oculinidae	*Galaxea acrhelia*	VU	A4c
Hard Corals	Oculinidae	*Galaxea astreata*	VU	A4cd
Hard Corals	Pectiniidae	*Echinophyllia costata*	VU	A4c
Hard Corals	Pectiniidae	*Pectinia alcicornis*	VU	A4c
Hard Corals	Pectiniidae	*Pectinia lactuca*	VU	A4cd
Hard Corals	Pocilloporidae	*Pocillopora ankeli*	VU	A4c
Hard Corals	Pocilloporidae	*Pocillopora danae*	VU	A4ce
Hard Corals	Pocilloporidae	*Pocillopora elegans*	VU	A4ce
Hard Corals	Pocilloporidae	*Seriatopora aculeata*	VU	A4c
Hard Corals	Pocilloporidae	*Seriatopora dendritica*	VU	A4c
Hard Corals	Poritidae	*Alveopora allingi*	VU	A4cd
Hard Corals	Poritidae	*Alveopora daedalea*	VU	A4c
Hard Corals	Poritidae	*Alveopora fenestrata*	VU	A4c
Hard Corals	Poritidae	*Alveopora gigas*	VU	A4c
Hard Corals	Poritidae	*Alveopora marionensis*	VU	A4c
Hard Corals	Poritidae	*Alveopora verrilliana*	VU	A4cd
Hard Corals	Poritidae	*Goniopora burgosi*	VU	A4c
Hard Corals	Poritidae	*Goniopora planulata*	VU	A4c
Hard Corals	Poritidae	*Goniopora polyformis*	VU	A4c

Taxa	Family	Species	Category	Criteria
Hard Corals	Poritidae	*Porites aranetai*	VU	A4cde
Hard Corals	Poritidae	*Porites attenuata*	VU	A4cde
Hard Corals	Poritidae	*Porites cumulatus*	VU	A4cde
Hard Corals	Poritidae	*Porites horizontalata*	VU	A4cde
Hard Corals	Poritidae	*Porites napopora*	VU	A4cde
Hard Corals	Poritidae	*Porites nigrescens*	VU	A4cde
Hard Corals	Poritidae	*Porites rugosa*	VU	A4cde
Hard Corals	Poritidae	*Porites sillimaniana*	VU	A4cde
Hard Corals	Poritidae	*Porites tuberculosa*	VU	A4cde
Hard Corals	Siderastreidae	*Psammocora stellata*	VU	A4ce
Sea Cucumbers	Holothuriidae	*Actinopyga echinites*	VU	A2bd
Sea Cucumbers	Holothuriidae	*Actinopyga mauritiana*	VU	A2bd
Sea Cucumbers	Holothuriidae	*Actinopyga miliaris*	VU	A2bd
Sea Cucumbers	Holothuriidae	*Bohadschia maculisparsa*	VU	D2
Sea Cucumbers	Holothuriidae	*Holothuria fuscogilva*	VU	A2bd
Sea Cucumbers	Stichopodidae	*Stichopus herrmanni*	VU	A2bd