OCTOBER 2025

Wallacea

Biodiversity Hotspot

ECOSYSTEM PROFILE

CRITICAL ECOSYSTEM PARTNERSHIP FUND

CRITICAL ECOSYSTEM PARTNERSHIP FUND

Ecosystem Profile

Wallacea Biodiversity Hotspot

2025 Update

FINAL VERSION
SEPTEMBER 2025

Prepared by:

Critical Ecosystem Partnership Fund

Drafted by the ecosystem profiling team:

Adi Widyanto
Jihad
Lalu Abdi Wirastami
Ria Saryanthi
Pete Wood
Yudi Herdiana

With the assistance of:

Burung Indonesia
Andi Faisal Alwi
Angga Yoga
Vincentia Ismar Widyasari
Muhammad Meisa
Yohannis Balla Djawarai
Benny Aladin Siregar
Tiburtius Hani
Agus Budi Utomo

CEPF
Dan Rothberg
Christopher Macfarlane
Jack Tordoff

BirdLife International
Andrew Plumptre
Mike Crosby
Gill Bunting

Marine update assisted by the following individuals in Indonesia:

Baileo	Rony J Siwabessy
Baileo	Nus Ukru
Balang Institute	Adam Kurniawan
BARAKAT	Benediktus Bedil
Burung Indonesia	Muhammad Meisa
Burung Indonesia	Agung Dewantara
Burung Indonesia	Amsurya Warman
Burung Indonesia	Tiburtius Hani
Burung Indonesia	Dwi Widya Saputra
Central Sulawesi Marine Affairs and Fisheries Agency	M. Edward Yusuf.
Conservation International	Abraham Sianipar
Coral Triangle Center	Marthen Welly
Dinas Lingkungan Hidup Banggai Kepulauan	Ferdy Salamat
IMUNITAS	Shadiq Maumbu
Institut Pertanian Bogor, Department of Fisheries Utilization	Budy Wiryawan
Japesda Gorontalo	Ahmad Bahsoan
Khairun University Ternate	M Nasir Tamalene
Komunitas Teras	Imran Tumora
Lembaga Partisipasi Pembangunan Masyarakat	Piet Wairisal

Maluku Province Marine Affairs and Fisheries Agency	Zainal
Maluku Province Marine Affairs and Fisheries Agency	Elin Talahatu
Manengkel Solidaritas	Viando Emanuel Manarisip
Ministry of Marine Affairs and Fisheries	Toni Ruchimat
Ministry of Marine Affairs and Fisheries	Andi Rusandi
Ministry of Marine Affairs and Fisheries	Pingkan Roeroe
Ministry of Marine Affairs and Fisheries	Muhammad Subhan Wattiheluw
Ministry of Marine Affairs and Fisheries	Amehr Hakim
Ministry of Marine Affairs and Fisheries	Suwardi
Ministry of Marine Affairs and Fisheries	Erina Nelly
Ministry of Marine Affairs and Fisheries	Muhammad Saifullah
Ministry of Marine Affairs and Fisheries	Yudit Tia Lestari
Ministry of Marine Affairs and Fisheries	Firdaus Agung
Ministry of Marine Affairs and Fisheries	Agus Sapari
Ministry of Marine Affairs and Fisheries	Noberta Oktaviani
Ministry of Marine Affairs and Fisheries	Bustamin
Ministry of Marine Affairs and Fisheries	Ihsan Ramli
Muhammadiyah University Luwuk	Abdul Gani
Pattimura University	James Abrahamsz
Perkumpulan OASE	Andi Adriadi
Perkumpulan Wallacea	Basri Andang
Perkumpulan YAPEKA	Efra Wantah
Perkumpulan YAPEKA	Topan Cahyono
RARE Indonesia	Stuart Campbell
Relawan Orang dan Alam	Mochammad Subarkah
SALANGGAR	Ellyas Palalas
SIKAP Institute	Muhammad Akib
Sustainable Fisheries Partnership	Dessy Anggraeni
Tadulako University	Samliok Ndobe
USAID SEA Project	Rudyanto
Universitas Hasanuddin	Abigail Mary Moore
USAID SEA Project	Noora Febrianie
Wildlife Conservation Society	Irfan Yulianto
Wildlife Conservation Society	Shinta Pardede
Yayasan Konservasi Laut Indonesia	Nuryamin
Yayasan Panorama Alam Lestari Poso	Fadhil Abdullah
Yayasan Pengkajian dan Pengembangan Sosial	Melky Koly Baran
Yayasan Pengkajian dan Pengembangan Sosial	Magdalena Rianghepat
Yayasan Rumah Ganeca	Marsel Ivan Korompis

Yayasan SEMANK	Sri Endah Widiyanti
Yayasan SEMANK	Mufti murhum
Yayasan Tananua	Hironimus Pala
Yayasan Tananua	Metty Wasa
Independent	Ahmad Wahyudi
Independent	Ariq Naufal Trisarjono
Independent	Eveline Wahyuningtyas
Independent	Hazman Fillin
Independent	Yusran Nurdin Massa
Independent	Pemela Loupatty
Independent	Robi Ricardo
Independent	Yogie Chrisswarsono
Independent	Muhammad Eka Rahman
Independent	Nila Olfia Rahmawati
Independent	Hadi Purwanto
Independent	Dodik Afriyanto
Independent	Nirwan
Independent	Hj Rahmah
Independent	Benyamin Gosa
Independent	Muhammad Korebima
Independent	Ruwaidah
Independent	Gusti Dianda Sari
Independent	Aprelia Martina
Independent	Bas Wurlianty
Independent	Hulwatun Nibras Saidah
Independent	Fret Ariyanto Tokandari
Independent	Wigatiningsih
Independent	Supeno Surija
Independent	Sonny Lahati
Independent	Junaedi H
Independent	Erlyn Manuel
Independent	Juanita Sopahel
Independent	Wawan AG
Independent	Venika Satria
Independent	Ikhsan
Independent	Armin Lestaluhu

<u>Terrestrial and freshwater update assisted by the following individuals in Indonesia and Timor-Leste:</u>

Aketajawe Lolobata National Park	Jarot Trihatmoko
AMAN Tana Luwu	Muh. Surya Alda Akbar S

Awam Green Indonesia	Rahmat Hidayat
Awam Green Indonesia	Wing Prabowo
Awam Green Indonesia	Fret Ariyanto
Badan Riset dan Inovasi Nasional	Destario Metusala
Badan Riset dan Inovasi Nasional	Mohammad Irham
Baileo	Jefferson Tasik
Balang Institute	Abd Habir
Balla Konservasi	Muhammad Sigit
Bogani Nani National Park	Supriyanto
Bogani Nani National Park	Dini
Conservation International Timor-Leste	Manuel Mendes
Fauna & Flora International	Mahendra Primajati
Fauna & Flora International	Ady Kristanto
Iguana Tompotika	Maryati Abiduna
IMUNITAS	Enjang Tri Budianto
Japesda Gorontalo	Christopel Paino
Jurnal Celebes	Ferdhiyadi
Karang Taruna Luwu Timur	Bakratang
Konservasi Kakatua Indonesia	
Lembaga Partisipasi Pembangunan Masyarakat	William CH Tutuarima
Lembaga Pelita Sumba	Umbu Rihimeha
Lembaga Pelita Sumba	Yulius Opang
Lembaga Pelita Sumba	Umbu Rihimeha Marambandam
Manengkel Solidaritas	Edwin Tumoka
Manengkel Solidaritas	Erlando Tumangken
Manengkel Solidaritas	Steven J A Siwu
Manupeu Tanadaru-Laiwangi Wanggameti National Park	Agus Kukumanegara
Manupeu Tanadaru-Laiwangi Wanggameti National Park	Dwi Putro
Manusela National Park	Cecep
Manusela National Park	Mangiring Sibarani
Manusela National Park	MHD Zaidi
Ministry of Environment and Forestry	Indra Exploitasia
Ministry of Environment and Forestry	Dessy Satya
Ministry of Environment and Forestry	E. Irwan Afrizal
Ministry of Environment and Forestry	Kukuh Santoso
Ministry of Environment and Forestry	Andie Martin
Ministry of Environment and Forestry	Faris R
Ministry of Environment and Forestry-Banggai Kepuluan District	Ir. Ferdy Salamat
Ministry of Environment and Forestry-Banggai Kepuluan District	Masnita Samila

Ministry of Environment and Forestry-Banggai Kepuluan District	Fitriah Bidalo
Ministry of Environment and Forestry-Sulawesi Selatan Province	Hasriyanti
Pattimura University	Agustinus Kastanya
Perkumpulan Jaringan Humba Hammu-Sumba	Trouce Landukara
Perkumpulan Konservasi Kakatua Indonesia	Dudi Nandika
Perkumpulan Payo Payo	Karno Batiran
Perkumpulan Salanggar	Moh. Rizal Mutael
Perkumpulan Wallacea	Nurlaela
Perkumpulan Wallacea	Asrul
Perkumpulan Wallacea	Marsus Zakaria
Perkumpulan YAPEKA	Tri Hartati
Pusat Studi Pembangunan Berkelanjutan	Wahyudin Abd. Karim
Rainforest Alliance	Mochammad Subkhi Hestiawan
Relawan Orang dan Alam	Nofarman
SEKNAS Fitra	Badiul Hadi
SIKAP Institute	Muhamad Akib
Sulawesi Community Foundation	Arham
Tasikoki Wildlife Rescue Centre	Billy Gustafianto Lolowang
Universitas Andi Djemma Palopo	Liana S.Hut
Universitas Halmahera	Ebedly Lewerissa
Universitas Hasanuddin, Faculty of Forestry	Dr. Risma Illa Maulany
Wirausaha	Suwardin
Yayasan Bumi Sawerigading	Muh Ishari
Yayasan IDEP Selaras Alam	Muchamad Awal
Yayasan Injuwatu Sumba	Adolof Huki Maramba Bahi
Yayasan Kiranis	Johan Lefmanut
Yayasan Kompas Peduli Hutan Sulawesi Tengah	Gifvents
Yayasan Komodo Survival Program	Achmad Ariefiandy
Yayasan KOPPESDA	Deni Karanggulimu
Yayasan Mitra Tani Mandiri	Josef Maan
Yayasan Mitra Tani Mandiri	Yosef Sumu
Yayasan Panorama Alam Lestari Poso	Fadhil Abdullah P
Yayasan Pengembangan dan Pemberdayaan Masyarakat Maluku	Abdulgani Fabanjo
Yayasan Pengembangan dan Pemberdayaan Masyarakat Maluku	Mukadar Alhamid
Yayasan Pengkajian dan Pengembangan Sosial	Melky Koli Baran
Yayasan Pusat Informasi Lingkung Indonesia	Zaini Rakhman
Yayasan Romang Celebes Indonesia	Ridwan
Independent	Dwi Siswati K

CONTENTS

EXECUTIVE SUMMARY ..... **ix**
1. INTRODUCTION **1**
2. BACKGROUND **3**
3. LESSONS FROM PREVIOUS INVESTMENT IN WALLACEA **5**
3.1 The investment strategy for Phase I and Phase II 5
3.2 Overview of previous investment 8
3.3 Terrestrial/freshwater portfolio overview (Phase I) 10
3.4 Marine portfolio overview (Phase I and Phase II) 10
3.5 Other grants (Phase II) 10
3.6 Geographic and thematic focus of grant-making (Phase II) 11
3.7 Accessibility of grants to local stakeholders (Phase II) 13
3.8 Impact summary (Phase II) 13
3.9 CSO capacity building and networking (Phases I and II) 16
3.10 Lessons from Phase I and Phase II 19
3.11 Lessons from the independent evaluation of the RIT 21
4. BIOLOGICAL IMPORTANCE OF THE HOTSPOT **24**
4.1 Geography 24
4.2 Geology 25
4.3 Climate 27
4.4 Habitat and ecosystems 27
4.5 Species diversity and endemism 32
5. CONSERVATION OUTCOMES DEFINED FOR THE HOTSPOT **35**
5.1 Methodology 35
5.2 Conservation outcomes 42
6. SOCIOECONOMIC CONTEXT **84**
6.1 Indonesia 84
6.2 Timor-Leste 97
6.3 Conclusion 101
7. POLICY CONTEXT **102**
7.1. Indonesia 102
7.2 Timor-Leste 120
8. CIVIL SOCIETY CONTEXT **124**
8.1 Indonesia 125
8.2 Timor-Leste 140
9. THREATS **148**
9.1 Overexploitation of natural resources 148
9.2 Habitat degradation, fragmentation and conversion 152

9.3 Pollution, erosion and sedimentation 155
9.4 Invasive species 156
9.5 Climate change 157
9.6 Indirect causes of threats 157
9.7 Results of analysis of threats to KBAs 159
9.8 Analysis of threats to marine corridors in Wallacea 166
10. CLIMATE CHANGE ASSESSMENT 171
10.1 Current and projected climate patterns in Wallacea 171
10.2 Impacts of climate change on biodiversity 175
10.3 Social and economic impacts of climate change 177
10.4 Climate change policies, institutions and programs 178
10.5 Conclusion: opportunities for Wallacea within the climate agenda 182
11. ASSESSMENT OF CURRENT CONSERVATION INVESTMENT 184
11.1 Investment by source 184
11.2 Interaction of funding mandates and sources 203
11.3 Gap analysis: terrestrial 204
11.4 Gap analysis: marine 205
11.5 Conclusion: a niche for CEPF in Wallacea 205
12. CEPF INVESTMENT NICHE 210
13. CEPF INVESTMENT STRATEGY AND PROGRAM FOCUS 211
13.1 Priority species 211
13.2 Geographic priorities 213
13.3 Strategic directions and investment priorities 224
14. RESULTS FRAMEWORK 235
15. SUSTAINABILITY 239
15.1 Capacity building for sustainability 239
15.2 Sustainable financing 239
15.3 Sustaining change through norms and regulations 240
15.4 The ecosystem profile as a public good 240
REFERENCES 241
APPENDIX 1. SPECIES OUTCOMES IN WALLACEA 247
APPENDIX 2. SITE OUTCOMES IN WALLACEA 257
APPENDIX 3. PROTECTED AREAS IN TIMOR-LESTE NOT RECOGNIZED AS KBAS 275
APPENDIX 4. CORRIDORS OUTCOMES IN WALLACEA 277

Note to Readers

The Critical Ecosystem Partnership Fund (CEPF) prepared an ecosystem profile for the Wallacea Biodiversity Hotspot in 2013-2014 covering terrestrial, freshwater and marine/coastal ecosystems in central Indonesia and Timor-Leste. This document guided a first phase of investment from 2014 to 2020. In 2020, CEPF prepared an updated investment strategy, focused on coastal and marine ecosystems only. This strategy guided a second phase of investment in the hotspot from 2020-2024, which focused only on Indonesia.

The present document expands the coastal and marine update to include terrestrial and freshwater ecosystems in the Indonesian part of the hotspot, and all ecosystems in Timor-Leste. The updated ecosystem profile will guide a third phase of investment in the hotspot, from 2025 to 2031. Note that much of the information in the 2014 and 2020 documents remains valid, particularly data tables on species, sites, corridors and protected areas. This latest update document purposefully does not repeat information from 2014 and 2020 in a wholesale manner. Rather, it includes only information that is immediately relevant to guiding the third phase of investment. Readers are advised to refer to the 2014 and 2020 documents, and their respective lists of bibliographic references, for further information.

EXECUTIVE SUMMARY

The Critical Ecosystem Partnership Fund (CEPF) is designed to safeguard the world's biologically richest and most threatened regions, known as biodiversity hotspots. It is a joint initiative of l'Agence Française de Développement, Conservation International, the European Union, Fondation Hans Wilsdorf, the Global Environment Facility, the Government of Canada, the Government of Japan and the World Bank. A fundamental purpose is to engage civil society organizations (CSOs), such as community groups, nongovernmental organizations, academic institutions and private enterprises, in conservation in the global biodiversity hotspots. CEPF engages civil society via grant funding in alignment with an ecosystem profile: a shared strategy developed in consultation with local stakeholders, which articulates a multi-year investment strategy informed by a detailed situational analysis.

The Wallacea Biodiversity Hotspot includes the whole of Timor-Leste and the central portion of Indonesia, including the major island groups of Sulawesi, Maluku and the Lesser Sundas. It qualifies as a hotspot due to its high levels of plant endemism and extensive loss of natural vegetation. The chief causes of biodiversity loss include overexploitation of natural resources, degradation, fragmentation and conversion of habitat, and pressure from human population growth and economic development. CEPF first began work in Wallacea in 2014. During the first phase of CEPF investment in the hotspot, from 2014 to 2020, CEPF awarded US$6.7 million via 109 grants to local and international CSOs for projects in both the Indonesian and East Timorese parts of the hotspot. This was followed by a second phase of investment, during 2020-2024, when CEPF awarded US$2.7 million via 63 grants, only for projects in Indonesia, and with a focus on coastal and marine ecosystems. CEPF investment during Phase I was guided by an ecosystem profile for the whole hotspot; during Phase II, it was guided by a shorter update focused on coastal and marine ecosystems. During both phases, local coordination and support for the grants program were provided by a regional implementation team hosted at Burung Indonesia, at its office in Bogor, Indonesia.

The lessons and results of Phase I guided Phase II and inform this broader, hotspot-wide ecosystem profile update, which covers terrestrial, freshwater, coastal and marine ecosystems in both Indonesia and Timor Leste. The lessons highlighted the importance of: setting geographic priorities to ensure efficient implementation of the program; facilitating communication and networking among grantees; creating links between CSOs and government agencies; building capacity among grantees; and emphasizing local community engagement. Lessons extended to: promoting a transition from unregulated, open-access exploitation of natural resources toward regulation and sustainable use; participatory planning; strengthening local management institutions; addressing short-term economic needs that drive unsustainable exploitation; facilitating validation of community-level plans by government; leveraging the ability of communities to serve as messengers for replication of successful efforts; and continuing to support ridge-to-reef efforts, as far as possible.

The Wallacea Hotspot has flora and fauna that are distinct from the Asian biogeographic realm to the west and the Australian biogeographic realm to the east. The western boundary of Wallacea, the Wallace Line, divides Borneo and Bali to the west from Sulawesi and Lombok to the east, and separates some groups of Asian fauna from the Australian fauna. The division does not apply perfectly to all taxonomic groups but it is sufficiently distinct for birds and non-flying mammals for it to be recognized as an important

biogeographic feature. The line marks the western limits of the distribution of marsupial mammals, cockatoos and several other bird families. The equivalent boundary at the eastern edge of Wallacea is the Lydekker Line, which runs to the east of Maluku (Halmahera, Seram, Kai, Tanimbar) and the Lesser Sundas (Timor), and to the west of New Guinea; with Australia lying outside Wallacea to the south. The boundary of Wallacea does not apply to marine species, as it cuts through the marine eco-regions where the archipelago is located. Nevertheless, Wallacea, along with the island of Papua to the east, is at the heart of the Coral Triangle: a region that has the richest marine biodiversity on Earth. The total land area of Wallacea is 33.8 million ha, which can be divided into three biogeographic subregions: Sulawesi; Maluku; and the Lesser Sundas. The area has over 1,500 endemic plant species, 127 endemic terrestrial mammal species, 274 endemic terrestrial bird species, and collectively over 300 endemic species of reptiles, amphibians, freshwater fish, marine fish, birdwing butterflies and corals.

CEPF has a goal of conserving globally threatened biodiversity. CEPF uses the term "conservation outcomes" to mean the conservation targets in a hotspot that need to be achieved to prevent species extinctions and biodiversity loss. Conservation outcomes are defined in terms of extinctions avoided (species outcomes), areas protected (site outcomes) and corridors created (corridor outcomes). Conservation outcomes are thus defined at three levels: species; site; and corridor. There are 728 globally threatened species in the hotspot, 398 Key Biodiversity Areas (KBAs) and 31 conservation corridors.

Work to conserve these species and better manage the KBAs and corridors is informed by the social and economic context of the two countries, existing policies that affect conservation and development activities, the state and operating context of civil society, threats to biodiversity, and more broadly, climate change. It is also informed by ongoing investment by the two national governments, local governments, the domestic private sector, and by international public and private donors. Ultimately, this context creates a "niche" for future CEPF investment and, thereby, defines a strategy to guide grantmaking.

CEPF's proposed investment strategy focuses on 23 priority terrestrial and freshwater species (comprising mammals, birds and reptiles), 37 priority marine species (including several sharks and sea turtles, as well as dugong and sea cucumbers), 134 priority terrestrial sites in 12 priority KBA clusters (often small, co-adjacent and in clusters) and 46 priority marine sites in seven priority marine corridors. Thematic priorities for investment are defined in terms of "strategic directions" addressing threats to priority species, improved management of priority sites, sustainable natural resources management by Indigenous people and local communities, development of a robust and resilient community of CSOs, and strategic leadership through a Regional Implementation Team.

Strategic directions and investment priorities for CEPF investment in Wallacea

CEPF strategic directions	CEPF investment priorities
1. Address threats to priority species	1.1 Monitor exploitation and trade of priority species 1.2 Change societal behavior towards priority species through appropriate enforcement, education, incentives and alternatives 1.3 Mainstream the concepts of globally threatened species and biodiversity conservation into popular ethos and laws, policies and regulations

CEPF strategic directions	CEPF investment priorities
2. Improve management of priority sites with and without official protection status	2.1 Facilitate effective collaboration among CSOs, local and Indigenous communities and government agencies to improve planning and management of priority sites 2.2 Work with central and local governments on specific legal and policy instruments for better site management, and build a constituency of support for their promulgation and implementation
3. Support sustainable natural resource management by Indigenous people and local communities in priority geographies	3.1 Support community institutions to secure adequate rights over resources, and to develop and implement rules on resource use 3.2 Develop alternatives for livelihoods otherwise dependent on unsustainable resource management practices and enhance markets for sustainably produced products and services 3.3 Promote the use of existing policies for conservation, including on Indigenous rights and environmental safeguards 3.4 Facilitate links among communities, CSOs, cooperatives, business associations and the private sector to create economic incentives for changes in practice and behavior
4. Facilitate the development of a robust and resilient community of conservation civil society organizations	4.1 Ensure that CEPF grantees have the technical capacity to plan, implement and sustain effective conservation projects 4.2 Provide support to targeted conservation CSOs engaged in a process of organizational development 4.3 Enhance the collective strength and ability of conservation CSOs
5. Provide strategic leadership and effective coordination of conservation investment through a Regional Implementation Team	5.1 Support a broad constituency of civil society groups working across institutional and political boundaries towards achieving the shared conservation goals described in the ecosystem profile

1. INTRODUCTION

The Critical Ecosystem Partnership Fund (CEPF) is designed to safeguard the world's biologically richest and most threatened regions, known as biodiversity hotspots. It is a joint initiative of l'Agence Française de Développement (AFD), Conservation International (CI), the European Union (EU), Fondation Hans Wilsdorf, the Global Environment Facility (GEF), the Government of Canada, the Government of Japan and the World Bank.

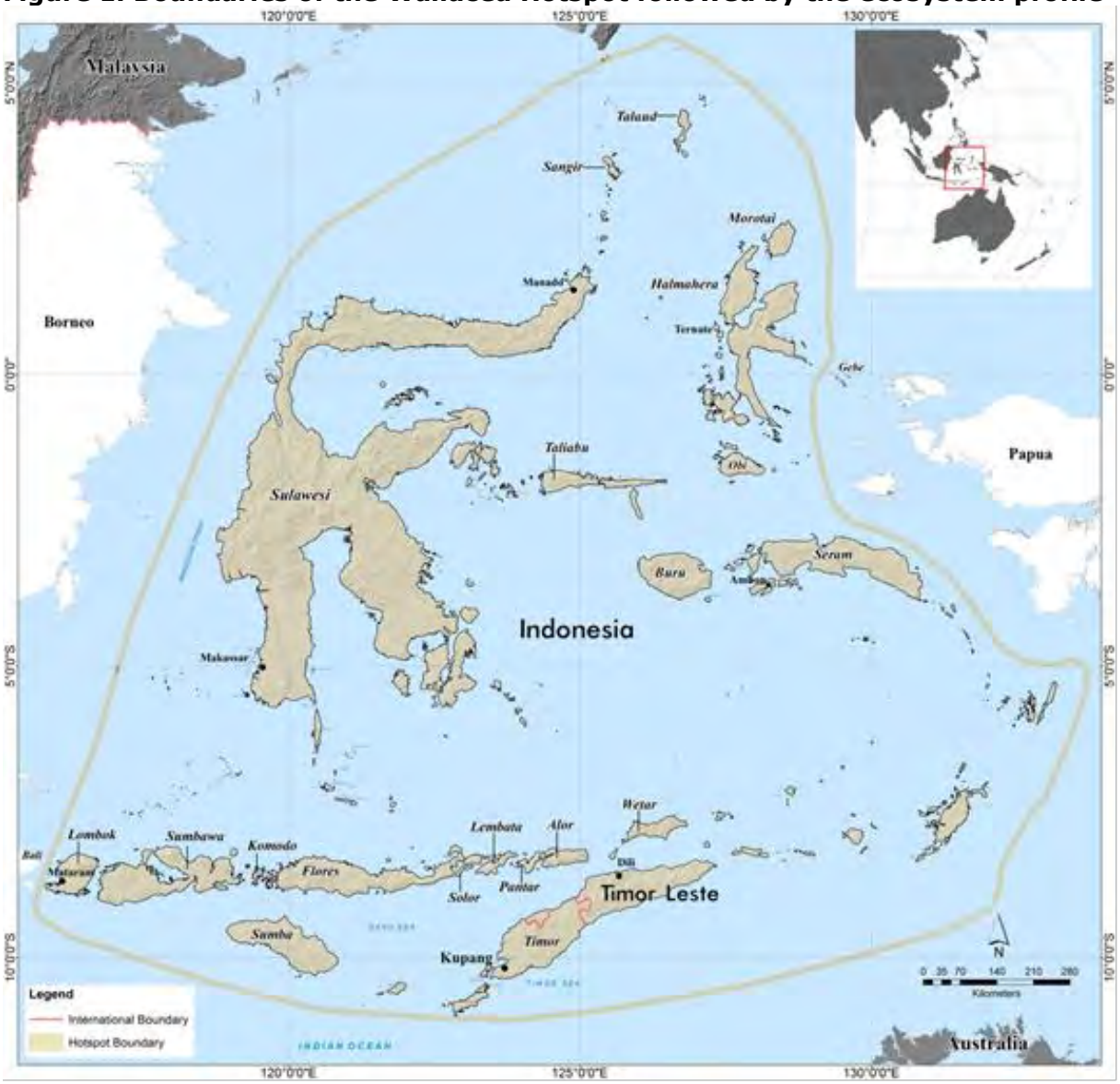
A fundamental purpose of CEPF is to engage civil society organizations (CSOs), such as community groups, nongovernmental organizations (NGOs), academic institutions and private enterprises, in conservation of the global biodiversity hotspots. To guarantee their success, these efforts must complement existing strategies and programs of national governments and other conservation funders. To this end, CEPF promotes working alliances among diverse groups, combining unique capacities and reducing duplication of efforts for a comprehensive, coordinated approach to conservation. One way in which CEPF does this is through preparation of ecosystem profiles: shared strategies, developed in consultation with local stakeholders, which articulate a multi-year investment strategy informed by a detailed situational analysis.

The Wallacea Biodiversity Hotspot (Figure 1) includes the whole of Timor-Leste and the central portion of Indonesia, including the major island groups of Sulawesi, Maluku and the Lesser Sundas. It qualifies as a hotspot due to its high levels of plant endemism and extensive loss of natural vegetation. The chief causes of biodiversity loss include overexploitation of natural resources, degradation, fragmentation and conversion of habitat, and pressure from human population growth and economic development. Wallacea is an island region, with over 1,680 islands and 30 million people, the majority of whom live in coastal areas earning their living from farms, forests, wetlands and the sea. The region is also notable for its outstanding marine biodiversity and is part of the Coral Triangle, an area with among the most extensive intact reefs in the world.

The original ecosystem profile for Wallacea, completed in 2014, covered terrestrial, freshwater and coastal/marine ecosystems in both Indonesia and Timor-Leste. This document guided the first phase of CEPF investment in the hotspot, from December 2014 to June 2020, during which CEPF awarded US$6,689,317 via 109 grants to local and international CSOs. This funding was provided by CEPF's global donors, plus a contribution from the Margaret A. Cargill Philanthropies (MACP) for coastal and marine conservation.

As Phase I of CEPF investment in Wallacea came to a close, additional funding towards a second phase of investment was committed by MACP and four other donors: the Bloomberg Philanthropies Vibrant Oceans Initiative (VOI); the Walton Family Foundation; the David and Lucile Packard Foundation; and the Nimick Forbesway Foundation. During Phase II, CEPF awarded a total of US$2,690,918 via 63 grants, between July 2020 and November 2024. Unlike in Phase I, which covered both Indonesia and Timor-Leste and which covered terrestrial, freshwater and coastal/marine ecosystems, the funding for Phase II was restricted to Indonesia and to the marine realm. Further, unlike in Phase I, when funding was made available to international and local CSOs, funding in Phase II was only available to local (Indonesian) organizations. To guide the Phase II investment, in 2020, a team prepared an updated investment strategy for coastal and marine ecosystems.

Figure 1. Boundaries of the Wallacea Hotspot followed by the ecosystem profile



Certainly, there have been changes since 2014, when the original ecosystem profile was prepared, including changes to the IUCN Red List of Threatened Species, changes in knowledge about the distribution of biodiversity elements of global significance, reflected in the identification of new Key Biodiversity Areas (KBAs), changes to the nature and relative importance of threats to biodiversity and their root causes, and changes to the enabling environment for CSOs in the hotspot

As CEPF continues to promote engagement and investment to support biodiversity conservation in the whole of Wallacea, the current document seeks to complement the updated investment strategy prepared in 2020, with modestly revised geographic and species priorities and technical themes for investment, covering both Indonesia and Timor-Leste and terrestrial, freshwater and coastal/marine ecosystems.

2. BACKGROUND

The purpose of this ecosystem profile is to provide an overview of biodiversity conservation in Wallacea, an analysis of the priorities for action, and a description of the constituency for conservation in the hotspot. In doing so, it lays out a strategic framework for the future conservation grant-making program in Wallacea, by CEPF or other funders seeking to support civil society. This document is an updated version of the original, 2014, profile and includes updates made to the marine sections in 2020.

The ecosystem profile describes biodiversity conservation actions needed in Wallacea by defining *conservation outcomes*. As described in detail in Chapter 4, these outcomes are defined at three levels: species; sites; and corridors (i.e., landscapes or seascapes). The outcomes are defined for species that are considered by IUCN to be globally threatened with extinction. The basic unit of analysis for defining conservation outcomes, therefore, is information on sites where populations of species of conservation concern can be found. To collate this information, the profiling team reviewed existing analyses, in particular, BirdLife International's Important Bird Areas and Endemic Bird Areas analyses, and the IUCN Red List accounts for globally threatened species. It also reviewed published books, reports and papers describing species and habitats in Wallacea, as well as unpublished reports and information available on the Web.

The original ecosystem profile was prepared by Burung Indonesia, in partnership with the Bogor Agricultural University Center for Marine and Coastal Studies, the BirdLife International Secretariat, the Samdhana Institute, and the Wildlife Conservation Society (WCS) Indonesia Program. Hametin Associates provided input and facilitated implementation of the profiling process in Timor-Leste. The data collation and consultation process lasted from June 2013 to February 2014. A total of 262 people participated in eight two-day workshops in Ternate, Manado, Ambon, Makassar, Mataram, Sumba, Kupang and Dili. Each workshop discussed in detail the analysis for a specific part of Wallacea, cross-checking the team's data on the names and locations of sites, discussing the boundaries identified, and verifying the presence of species of conservation concern. The workshops also provided an opportunity to collect information on stakeholders, threats and conservation actions at each site. The lists of species and the maps of proposed priority sites (KBAs) were posted on a website (www.wallacea.org) and promoted through a Facebook page (www.facebook.com/ProfilEkosistemWallacea). The list of sites identified for species of conservation concern was also discussed with scientists in Indonesia and internationally who specialize in specific taxonomic groups. Data and comments came from leading scientists from the Indonesian Scientific Institute, the Bandung Technological Institute, Royal Botanic Garden Kew, CI, BirdLife International, and universities in Australia, the United States of America (USA) and elsewhere.

In 2020, five private USA-based philanthropies supported CEPF to continue work in the marine portion of Indonesian Wallacea. To program the use of the funds, CEPF commissioned a small team to update the marine components of the investment strategy during July-August 2020. Almost all internal and external meetings took place over the internet, as the ongoing COVID-19 pandemic made travel and physical meetings difficult. The team compiled new data on conservation and marine species in Wallacea, and reviewed and updated the key chapters on policy, civil society, threats and investment. The team consulted with officials from the key ministries, and with a group of marine experts, which

included input from the Ministry of Marine Affairs and Fisheries (MMAF) research institute, RARE, CI, the Coral Triangle Centre and WCS. Lessons from Phase I, the revised corridors and the plans for a second phase were presented and discussed through an online public meeting, which had 79 participants.

Key meetings for the 2020 coastal and marine consultation are summarized in Table 1.

Table 1: Summary of consultations for the coastal and marine investment strategy

Date	Type of consultation	Participants
12 August 2020	Marine experts-to review corridor identification	International CSO (6); National CSO (2); University (1); Government (1) TOTAL: 10
19 August 2020	Government-to seek information on policy and ensure coordination	Government (MMAF) (13) TOTAL: 13
25 August 2020	Stakeholder consultation-to inform participants from the region about the new program and respond to questions about the plans	Provincial Government (3); District Government (1); Regional University (5); Local CSO (23); National CSO (9); International CSO (1); No organization given (34) TOTAL: 76

Consultations regarding the updating of the terrestrial and freshwater component of the ecosystem profile took place in June and July 2021. They were conducted remotely, due to limitations on in-person meetings during the global pandemic. In total, 78 people contributed to the process, including 20 representatives from the Ministry of Environment and Forestry and other relevant government agencies. Subsequently, data on threats, conservation investments and conservation priorities were updated between June and August 2025, by Burung Indonesia and the CEPF Secretariat, in preparation for a third phase of investment, from 2026 to 2031.

Consultations included several organizations that are themselves the representatives of traditional/customary communities (called *adat* in Indonesian), including Baileo, BARAKAT, Tananua, AMAN Maluku Utara, AMAN Sinjai and AMAN Tana Luwu. Each of these received grants in Phase I or Phase II and provided guidance to ensure that the Phase III investment strategy (Chapter 13) includes elements that are responsive to their needs and that are accessible to organizations with similar capabilities.

One lesson from the process is that, while there are many gaps in data on biodiversity in the region, there is also a great deal of data, published and unpublished, in the files of conservation organizations, universities, individual scientists, companies, government departments and citizen scientists. The ecosystem profile represents one of the first attempts to collate these data into one place and make it available to conservationists, decision-makers and other stakeholders in the region. Much of the data will be permanently available in the World Database of KBAs, managed by BirdLife International. There is, however, a need to continue to expand this initiative, and to regularly update the analysis of conservation priority sites as new information comes to light.

3. LESSONS FROM PREVIOUS INVESTMENT IN WALLACEA

3.1 The investment strategy for Phase I and Phase II

The two phases of CEPF investment in Wallacea were guided by the original ecosystem profile, prepared during 2013-2014, which informed Phase I and then a subsequent update of the profile, focused on marine conservation priorities, in 2020. The original ecosystem profiling process engaged stakeholders from across the region, representing more than 301 organizations from civil society, national and local government, private sector, media and donors, including UN agencies. The ecosystem profile identified: species outcomes, comprising 308 globally threatened terrestrial and freshwater species and 252 marine species; site outcomes, in the form of 251 terrestrial Key Biodiversity Areas (KBAs) and 74 marine KBAs, plus an additional 66 "candidate marine KBAs"; and corridor outcomes, comprising 10 terrestrial and 16 marine corridors. The final assessment report from Phase I summarizes the work that resulted from the 2014 ecosystem profile.

As Phase I grants were closing, and in the context of the COVID-19 pandemic and newly available donor funding, the primary authors of the original ecosystem profile prepared an update focused on marine conservation priorities. Due to the social distancing and travel restrictions in place at the time, the update was prepared entirely via remote interviews, video meetings and email. Ultimately, 76 stakeholders had input on revisions to the chapters on policy, civil society, threats and conservation investment, leading to revised species, site and corridor outcomes and an updated investment strategy. The 2020 update actually narrowed the list of globally threatened marine species to 226. It also prioritized 31 marine KBAs for CEPF investment, in addition to six marine corridors that overlap with globally significant coral reefs.

The 2020 update set out an investment strategy that informed CEPF grant making during Phase II, aligned with the priorities of the contributing donors, particularly in relation to fisheries management and engagement of coastal communities. Nevertheless, the Phase II investment strategy was purposefully written to align with that of Phase I, as far as possible, to allow for a common approach and standardization of results monitoring. The results frameworks for the two investment phases are shown below.

Table 2: Strategic directions and investment priorities for Wallacea Phase I (2014-2020) and Phase II (2020-2024)

Phase I	Phase II
1. Address threats to high priority species 1.1 Provide information to promote species outcomes and allow for monitoring and improved policies and programs of local and national government and other stakeholders 1.2 Change behavior of trappers, traders or buyers through appropriate enforcement, education, incentives and alternatives	**1. Address threats to high priority species** 1.1 Targeted monitoring of exploitation and trade of high-priority species 1.2 Change behavior of trappers, traders or buyers through appropriate enforcement, education, incentives, and alternatives

Phase I	Phase II
2. Improve management of sites (KBAs) with and without official protection status 2.1 Facilitate effective collaboration between CSO, local and indigenous communities and park management units to improve planning and management of official protected areas 2.2 Develop and implement management approaches that integrate sustainable use by business or local stakeholders with conservation of ecosystem values in KBAs outside official protected areas 2.3 Support surveys, research, and awareness campaigns to create new protected areas or better manage KBAs without protection status 2.4 Work with central and local governments on specific legal and policy instruments, including land use plans and development plans, for better site management, and build a constituency of support for their promulgation and implementation	**2. Improve management of sites (KBAs) with and without official protection status** 2.1 Facilitate effective collaboration between CSO, local and indigenous communities, private sector and MPA management units to improve planning and management of official protected areas 2.2 Work with central and local governments on legal and policy instruments to improve management effectiveness, including land use plans and development plans, for better site management
3. Support sustainable natural resource management by communities in priority sites and corridors 3.1 Support community institutions to secure adequate rights over resources, and to develop and implement rules on resource use 3.2 Develop alternatives for livelihoods otherwise dependent on unsustainable resource management practices and enhance markets for sustainably produced products and services 3.3 Propose specific legal and policy instruments to address obstacles to effective community based natural resource management at local or national level	**3. Support sustainable natural resource management by communities in priority sites and corridors** 3.1 Support community institutions to secure adequate rights over resources, and to develop and implement rules on resource use 3.2 Support sustainable management of small-scale fisheries through increased capacity, improved local regulation and strengthened local institutions 3.3 Develop alternatives for livelihoods otherwise dependent on unsustainable resource management practices and enhance markets for sustainably produced products and services 3.4 Engage with private sector to support sustainable practices 3.5 Consolidate and sustain the impact of community-based initiatives through integration into Government plans, policy and regulations, including identification of customary rights over marine resources

Phase I	Phase II
4. Strengthen community-based action to protect marine species and sites 4.1 Support the identification and establishment of new local marine protected areas 4.2 Strengthen local institutions and mechanisms for management and monitoring of marine protected areas 4.3 Support the engagement of local government to increase the financial sustainability and legal effectiveness of local marine protected areas 4.4 Facilitate the sharing of lessons and experiences between stakeholders involved in marine conservation initiatives	**4. Strengthen community-based action to protect marine species and sites** 4.1 Support strengthening and extension of existing locally managed MPAs, and the identification and establishment of new ones 4.2 Strengthen local institutions and mechanisms for management and monitoring of local marine protected areas 4.3 Support the engagement of local government to increase the financial sustainability and legal effectiveness of local marine protected areas 4.4 Facilitate the sharing of lessons and experiences between stakeholders involved in marine conservation initiatives
5. Engage the private sector in conservation of priority sites and corridors, in production landscapes, and throughout the hotspot 5.1 Engage with the private sector, business associations, and chambers of commerce so that corporate social responsibility (CSR) funding supports the goals of the Ecosystem Profile 5.2 Encourage mining and plantation companies and their funders and buyers, to consider conservation values in management of concessions and rehabilitation of production areas 5.3 Establish links between CSOs and organizations undertaking campaigns with consumers, financiers, and consumer-facing companies to create market-related incentives and disincentives for private sector to support conservation actions 5.4 Support efforts for mediation or formal engagement with mining and other industry to reduce threats from unlicensed operators or those operating with an illegitimate license	Not included as a strategic direction in Phase II based on lessons from Phase I, but numbering maintained

Phase I	Phase II
6. Enhance civil society capacity for effective conservation action in Wallacea 6.1 Enhance the capacity of civil society to identify, plan and undertake surveys, planning, implementation, and monitoring of conservation actions 6.2 Catalyze networking and collaboration among community groups, NGOs, private sector, and other elements of civil society 6.3 Increase the volume of sustainable funding available to civil society for conservation actions via capacity building and appropriate mechanisms	**6. Enhance civil society capacity for effective conservation action in Wallacea** 6.1 Enhance the institutional and technical capacity of civil society to identify, plan and undertake surveys, planning, implementation, and monitoring of conservation actions 6.2 Catalyze networking and collaboration among community groups, NGOs, private sector, and other elements of civil society 6.3 Strengthen local CSOs capacity for creative approaches to entrepreneurship, securing financial resources and influencing allocation of funds by other agencies
7. Provide strategic leadership and effective coordination of conservation investment through a Regional Implementation Team 7.1 Operationalize and coordinate CEPF's grant-making processes and procedures to ensure effective implementation of the investment strategy throughout the hotspot 7.2 Build a broad constituency of civil society groups working across institutional and political boundaries towards achieving the shared conservation goals described in the ecosystem profile 7.3 Engage governments and the private sector to mainstream biodiversity into policies and business practices 7.4 Monitor the status of biogeographic and sectoral priorities in relation to the long-term sustainability of conservation in the hotspot 7.5 Implement a system for communication and disseminating information on conservation of biodiversity in the hotspot	**7. Provide strategic leadership and effective coordination of conservation investment through a Regional Implementation Team** 7.1 Operationalize and coordinate CEPF's grant-making processes and procedures to ensure effective implementation of the investment strategy throughout the hotspot 7.2 Sustain and expand a broad constituency of civil society groups working across institutional and political boundaries towards achieving the shared conservation goals described in the ecosystem profile 7.3 Monitor the impact of grants towards conservation outcomes, disseminate lessons to encourage mainstreaming of biodiversity conservation by government and private sector

3.2 Overview of previous investment

CEPF committed US$6,689,317 in Phase I, which included a grant of US$1,499,399 to Burung Indonesia to serve as the Regional Implementation Team (RIT). Not counting the RIT, there were 33 large grants (for approximately US$3,808,000, or 73 percent of funds) and 75 small grants (for approximately US$1,381,000, or 27 percent of funds). International organizations received 21 percent of the funds available for large and small grants, the remainder was received by Indonesian and Timorese groups (i.e., local CSOs).

Burung Indonesia was engaged by CEPF to serve as the RIT for both Phase I and Phase II, to provide local coordination and support for grant making. In both phases, grants were predominantly solicited through open calls for proposals. As standard practice, before calls were issued, Burung conducted outreach workshops, to encourage the participation of local CSOs. In Phase II alone, Burung reached 200 organizations through these events.

The RIT was responsible for awarding small grants up to US$40,000 in Phase I. In Phase II, this amount increased to US$50,000. For amounts larger than this, the RIT reviewed the proposals and made joint decisions with the CEPF Secretariat on the award of large grants, which were directly contracted by CEPF. During Phase I, which was longer and had more funding, there were 12 calls for proposals, which generated 153 letters of inquiry (LOIs) for large grants and 240 for small grants. These applications resulted in 33 large grants and 75 small grants. Table 3 summarizes the calls for proposals and response received in Phase II.

Table 3: Calls for proposals during Phase II of CEPF investment in the Wallacea Hotspot (2020-2023)

No.	Focus	Release Date	Due Date	LOIs Received	
				Large	Small
1	All strategic directions and geographies	16 December 2020	16 January 2021	20	49
2	All strategic directions and geographies	18 June 2021	16 July 2021	11	35
3	All strategic directions and geographies	15 January 2022	15 February 2022	7	45
4	All strategic directions and geographies	19 March 2022	10 April 2022	4	0
5	Seven marine corridors: Togean Banggai; Solor-Alor; Sulawesi Utara; Sulawesi Tenggara; Pangkajene Kepulauan; Bentang Laut Buru; and Sulawesi Selatan	9 January 2023	7 February 2023	0	45
6	Seven marine corridors: Togean Banggai; Solor-Alor; Sulawesi Utara; Sulawesi Tenggara; Pangkajene Kepulauan; Bentang Laut Buru; and Sulawesi Selatan	8 August 2023	31 August 2023	0	26
Subtotal				**42**	**200**
Total				**242**	

In Phase II, excluding the RIT, US$2,224,409 was awarded in grants, all of it to Indonesian CSOs (Timor-Leste was not covered by the investment). These grants comprised 13 large grants for roughly US$867,000 (39 percent) and 49 small grants for roughly US$1,356,000 (61 percent).

In Phase I, including Burung Indonesia, 63 unique Indonesian CSOs received funding. Of these, 18 went on to receive grants in Phase II, as did 27 additional organizations that had not received them in Phase I. They were reached because of Phase II's emphasis on marine conservation and deeper engagement with Indonesian civil society.

3.3 Terrestrial/freshwater portfolio overview (Phase I)

Because Phase II did not have a terrestrial component, the only CEPF grants to have addressed terrestrial and freshwater conservation to date were those awarded during Phase I, which had all ended by mid-2020. During Phase I, 69 grants totaling US$2.7 million addressed terrestrial and freshwater conservation, equivalent to 53 percent of the total investment during the phase or 64 percent of the number of grants.

Grants were awarded for work in six of the 10 terrestrial corridors identified in the original ecosystem profile: Central Sulawesi; Flores Forests; Halmahera; Seram-Buru; North Sulawesi; and South Sulawesi. Of those, the former four were the highest priority terrestrial corridors identified in the original ecosystem profile. There were also grants made in terrestrial KBAs outside these corridors, and grants made in the terrestrial portion of the Peleang Banggai marine corridor.

3.4 Marine portfolio overview (Phase I and Phase II)

In Phase I, 31 grants totaling US$1.64 million were made for marine-focused projects, comprising 19 small grants with a total value of US$335,041 and 12 large grants with a total value of US$1.3 million. These grants accounted for 31 percent of all grants by value or 29 percent by number.

All grants awarded during Phase II, were for marine conservation, although some had a primary focus on coordinator (i.e., the RIT grant) or capacity building. Grant making focused on seven priority marine corridors: Sulawesi Utara; Sulawesi Selatan; Sulawesi Tenggara; Togean-Banggai; Pangkajene Kepulauan; Solor-Alor; and Bentang Laut Buru. However, five grants were implemented at marine KBAs outside of these corridors.

3.5 Other grants (Phase II)

In Phase II, there were five grants not associated with particular species, KBAs or corridors. These were to:

- Perkumpulan Masyarakat Jurnalis Lingkungan, to train policymakers and politicians in marine conservation issues.
- Yayasan Masyarakat dan Perikanan Indonesia, to provide overarching capacity building in fisheries management and governance to the numerous grantees.
- Asosiasi Perikanan Pole and Line dan Handline Indonesia, to establish market linkages between community fisheries and consolidated buyers.
- PT. Indonesia Lebih Hebat, to provide targeted capacity building for small organizations.
- Pusat Kajian Sumberdaya Pesisir dan Lautan Institut Pertanian Bogor, to better understand and promote how Other Effective Conservation Measures (OECM) apply in a marine conservation context.

3.6 Geographic and thematic focus of grant-making (Phase II)

3.6.1 Geographic focus

The distribution of grants during Phase II was as follows:

- Sulawesi Utara marine corridor (6 grants to 3 organizations).
- Sulawesi Selatan marine corridor (7 grants to4 organizations).
- Sulawesi Tenggara marine corridor (3 grants to 2 organizations).
- Togean-Banggai marine corridor (19 grants to 14 organizations).
- Pangkajene Kepulauan marine corridor (5 grants to 3 organizations).
- Solor-Alor marine corridor (8 grants to 6 organizations).
- Bentang Laut Buru marine corridor (8 grants to 6 organizations).
- Non-corridor (5 grants to 5 organizations).

Given Wallacea's political geography, the economic climate and the state of civil society, the moderate number of grants awarded in the Sulawesi Utara, Sulawesi Selatan, Solor-Alor (encompassing several islands of the Lesser Sundas) and Bentang Laut Buru (encompassing several islands of Maluku province) marine corridors is not surprising. There are sufficient organizations, with sufficient capacity, and willing government and community counterparts, to conduct work. The relatively few grants in the Sulawesi Tenggara corridor does not reflect a lack of potential partners but, rather, the availability (at the time) of significant investment under a major USAID initiative on marine conservation plus ongoing work on port development and shipping that occupied the attention of major government stakeholders.

Most noteworthy are the Pangkajene Kepulauan and Togean-Banggai marine corridors. The former is remarkable in that it received any grants at all. The former corridor is centered on the Pangkajene islands, which lie between Sulawesi and Sumbawa and are reachable only by sea. While the waters around these islands support remarkable marine life, they lie on a major shipping route and suffer from marine pollution and commercial fishing. When this corridor was prioritized due to lack of previous investment, the concern was that there would be no grantable entities with which to work. However, three CSOs (based in Makassar, Bogor and Jakarta) were able to initiate community engagement, raise awareness on marine issues, and organize fisheries cooperatives, which catalyzed *kabupaten*-level action to support local rights and management.

The Togean-Banggai marine corridor is remarkable for the large number of grants it received. This reflected several things. First, it was a priority, with four KBAs covering almost 860,000 ha of seascape. Second, there were great opportunities to leverage grants off one another and other investments. Concurrent with CEPF granting, the Government of Indonesia was in the process of creating a large open-ocean MPA in the surrounding waters. Multiple small grants to coastal communities purposefully complemented that parallel effort.

3.6.2 Thematic focus

CEPF's ecosystem profiles contain results frameworks built around strategic directions and subordinate investment priorities. These guide decision-making for grant awards and provide a thematic focus for projects. In basic terms, grant making in Wallacea focused on threatened species, community-managed protected areas, community-managed production

areas and government-managed protected areas, plus all the associated work that takes place in such locations, including fishery management, cooperative management, local governance, livelihood promotion, public awareness, local and national policy, and organizational strengthening. Thus, while a grant might have a focus on one strategic direction (e.g., Strategic Direction 4 on strengthening community-based action to protect marine species and sites), rarely would that be its only purpose. For instance, it may also include a component on organizational strengthening element for the grantee. As a result, the attribution of grants to a single strategic direction, for accounting purposes, can be misleading. Nonetheless, the *predominance* of a grant's focus is reflected there.

Two grants had a predominant focus on high priority species (Strategic Direction 1). One was to the Coral Triangle Center, which promoted dugong (*Dugong dugon*) conservation in the Lease islands (small islands off the coast of Ambon, Maluku), primarily by encouraging less disruptive fishing and conservation of seagrass beds. The other was to Yayasan Penyu Indonesia, which promoted turtle conservation in Sulawesi Tengah, raising the awareness of fishermen to avoid bycatch and also working to discourage trade in illegal turtle-shell products.

Seven grants had a predominant focus on government-managed (as opposed to community-managed) sites (Strategic Direction 2). This included better management of existing formal MPAs and creation of new ones. Perhaps unsurprisingly, there was less uptake of this strategic direction than the parallel, community-oriented one (Strategic Direction 4). Nevertheless, there grants were made to support creation of formal MPAs in Alor, Pangkajane and Liukang Tangaya, and to improve the management of existing MPAs in Bunaken and the Sabalana islands.

Twenty-four grants were awarded under Strategic Direction 3 to support sustainable use of coastal and marine resources. The strong demand for such grants is unsurprising. In fact, any locally based project that did not include this topic in some way would risk being ignored by the community. Projects built upon and institutionalized the role of traditional knowledge and resource use practices (e.g., Baileo in Nusalaut, Barakat in Lembata, Yayasan Sauwa Sejahtera in Negeri Waai, Yayasan Tana Ile Boleng in eastern Flores). They better managed mangroves for crab harvesting (e.g., Institut Peyarita, Yayasan Nypah, Yayasan Banua Biru Indonesia and Salangar, all working Sulawesi Tengah, Bone, and Banggai) and promoted sustainable management of demersal fisheries (e.g., Karsa Institute in Toggean, Lembaga Maritim Nusantara in Banggai Laut, and Destructive Fishing Watch Indonesia in Buton, Sulawesi Tenggara). They also supported governance and policy issues (e.g., Yayasan Mattirotasi Mitra Lestari in Moramo Bay, Sulawesi Tenggara, SIKAP Institute in Sulawesi Selatan), and processing of fishery products for local livelihoods (e.g., Manengkel's work with fishcake producers in Bitung, and YAPEKA's work with seagrass and sea cucumber cultivation in Sangihe).

Strategic Direction 4, on locally managed marine areas (LMMAs), also adopted a community-based approach, and was, thus, the focus of 23 grants. Given that CEPF makes grants to CSOs, its grantees were better positioned to promote the creation of community-managed multi-use zones (as opposed to the government-managed sites targeted by Strategic Direction 2), which allowed for both conservation (supported under Strategic Direction 4) and sustainable use (supported under Strategic Direction 3). Thus, there were grants that facilitated agreement with fishers' groups on the gear and seasonality of fishing in certain locations (e.g., to allow for breeding), such as those to: KKT Touna on Taupan

island; Lembaga Partisipasi Pembangunan Masyarakat and the LMMA Foundation, both off the coast of Seram; and Yayasan Konservasi Laut in the octopus fisheries off the coast of Makassar. There were also grants to improve the management structures over existing LMMAs (e.g., Perkumpulan Relawan untuk Orang dan Alam, Yayasan Khatulistiwa Alam Lestari, and Japesda, all in Peleng-Banggai).

There was no Strategic Direction 5 during Phase II. Grants under Strategic Direction 6 on capacity building are described in Section 3.5 above.

3.7 Accessibility of grants to local stakeholders (Phase II)

The experience from Phase I demonstrated that there is more than sufficient capacity among Indonesian CSOs to receive and implement grants with the administrative and financial management requirements of CEPF. Thus, the donors supporting Phase II mandated that grant funds only be available to local and national organizations. This never presented a problem in terms of interested or qualified applicants or during implementation, and there is no particular reason to change this model for any future investment.

3.8 Impact summary (Phase II)

3.8.1 Impacts on species

Grants had direct impacts on seven species: sandfish (a sea cucumber); hawksbill turtle; green sea turtle; dugong; bigeye thresher shark; pelagic thresher shark; and Banggai cardinalfish (*Pterapogon kauderni*). Grants also had demonstrable indirect impacts on five further species: shortfin mako shark; silky shark; blacktip shark; hammerhead shark; and Napoleon fish.

Among the first actions taken was awareness raising: teaching people that these species, while perhaps locally "apparent," if not abundant, are globally threatened, with unique value in Indonesia, often legally protected, and unable to tolerate the level of exploitation they face. In some cases, it was straightforward to identify the species (e.g., turtles, sharks) but it became difficult to address the problem, where people were consciously trying to catch turtles for their shells and eggs, or sharks for the market. In other cases, notably sea cucumbers, training was required to help people distinguish between a threatened species and a commercially viable species. Some grants were simply about teaching people to avoid certain practices, like disturbing the seagrass meadows where dugong feed, while others were about changing practices (e.g., the types of nets used, releasing entangled and non-commercial species from nets, open and closed seasons for fishing grounds, size limits).

Obviously, if a KBA enjoyed better protection, then every species in that KBA benefited. However, in the case of the shark species and Napoleon fish, grants were implemented in fishing communities where a range of practices were addressed across swaths of sea. Even as the pelagic and thresher shark were the identified species for protection, with enumerated reduced by-catch, the other species were shown to benefit as well.

In the case of the sandfish, YAPEKA worked with sea cucumber "farmers" to help them gain rights to shallow zones to cultivate commercially viable species in lieu of harvesting every animal they found in an unregulated area. In the case of the cardinalfish, work continued

with efforts, begun under Phase I, to promote aquarium cultivation and legal sale of the species *in lieu* of wild caught fish.

3.8.2 Impacts on KBAs and corridors

CEPF's primary focus in Wallacea was better management of areas of natural habitats (coral reefs, mangroves, seagrass beds, open sea, etc.) supporting important marine biodiversity. Work took place in KBAs but also, often, in broader corridors, because the KBA concept is difficult to apply in marine ecosystems, where the precise boundaries, based on presence of trigger species, are difficult to define.

While grants were typically tied to particular places and the end goal of the work was clear, these places had various management designations, each with its own set of institutional controls. These included:

- Formal, state-designated, government controlled MPAs (*kawasan konservasi perairan daerah* or KKPD), falling under the control of the Ministry of Marine Affairs and Fisheries (MMAF) but with management authority variously devolved to provincial authorities or the regional bodies of the national agency. Multiple grantees worked in and around existing MPAs to reduce threats, create new MPAs or create links between MPAs and other protected or sustainably managed zones.
- Fisheries Management Areas (FMAs), of which there are 11 in Indonesia, including four in the Wallacea Hotspot. FMAs are formally under the jurisdiction of the MMAF and promote sustainable management for commercial and artisanal fishing. Broadly understood as "open access," many grants were awarded to improve local fishing practices in these areas, with the goal of establishing natural resource rights and responsibilities but not with an explicit goal of protection.
- LMMAs (*daerah perlindungan laut* or DPL), where communities, often acting via village and district ordinances, claim rights to manage an area of sea. This allows them to create licensing requirements, limit fishing, conduct patrols, create permanent or temporary no-take zones, establish open and closed seasons, and other forms of control. The line between "protected" and "production" is often not clear in these places (it is a *protected* area, because there is a boundary and there are rules limiting what can take place inside the boundary; it is also a *production* area, because the rules allow people to harvest marine resources in a sustainable way). In Phase II, DPLs had further designation, where "traditional" or "Indigenous" (called *adat* in Indonesia) communities gained further rights.

Multiple projects took place in areas that had each of these designations, or where those designations changed. A mosaic pattern was the norm, where a vast "marine corridor," with no boundary markers, signs or clear authority, would have contiguous KKPD, DPL and fishing zones, and species that moved freely among all of them. Thus, reporting on grants could sometimes be difficult, if only because of nomenclature and literal uncertainty of boundaries. With these caveats in mind, grants took place in and improved the management of at least parts of the KBAs and corridors noted in Table 4.

Table 4: KBAs and corridors with improved management during CEPF Phase II

No.	KBA ID	KBA Name
Sulawesi Utara Corridor		
1	IDN009	Perairan Sangihe
2	IDN023	Selat Lembeh
3	IDN032	Perairan Arakan Wawontulap
Sulawesi Selatan Corridor		
4	IDN132	Perairan Pallime
5	IDN136	Kapoposang-Pangkep-Bulurokeng
6	IDN142	Perairan Tana Jampea
Sulawesi Tenggara Corridor		
7	IDN117	Wabula
Togean-Banggai Corridor		
8	IDN077	Perairan Kepulauan Togean
9	IDN079	Perairan Pagimana
10	IDN081	Perairan Peleng-Banggai
11	IDN087	Perairan Balantak
Solor-Alor Corridor		
12	IDN307	Pantai Selatan Lebau
13	IDN311	Perairan Lembata
14	IDN314	Selat Pantar
15	IDN320	Perairan Alor Utara
Seram-Buru Corridor		
16	IDN198	Kelang–Kassa–Buano–Marseg
17	IDN206	Perairan Gunung Salahutu
18	IDN208	Leihitu
19	IDN209	Perairan Haruku-Saparua

Breaking down what took place in the KBAs shows the following, starting with the most easily identifiable action, the creation of formal state MPAs. During Phase II, the Government of Indonesia declared three MPAs in Wallacea, covering a combined area of 715,218 ha:

- Kota Bitung (Sulawesi Utara).
- Liukang-Tangaya (Sulawesi Selatan).
- Perairan Kabupaten Lembata (Nusa Tenggara Timur).

Credit for this work lies principally with the government, whose civil servants, agency leaders and politicians guided these long-term efforts. CEPF grantees, Burung Indonesia, and other members of Indonesian civil society contributed, however, by collecting data, facilitating stakeholder engagement, raising awareness of surrounding communities, and promoting livelihoods and fisheries access of surrounding communities, so that they could act as good neighbors to these new MPAs.

In parallel, 10,024 ha of new LMMAs (DPLs) were declared and 25,028 ha within existing DPLs were strengthened. A further 7,239 ha of non-designated fishing zone were brought under improved management through licensing, catch limits and other controls. In particular, 688 ha of coral reef, 114 ha of mangrove and 86 ha of seagrass received special protection or were restored.

3.8.3 Impacts on communities and people

Work took place in 73 different communities (a loosely defined term) across six provinces. In many instances, this was a whole or part of an administrative unit (*desa* in Indonesian), which might qualify as a village or small town but could also itself consist of many subordinate hamlets, or, conversely, be a semi-autonomous neighborhood in a much larger city. Regardless of the administrative distinction, work occurred in 73 clearly defined places where grantees had clear invitations to engage with local residents, leaders and authorities. These communities then gave permission, or hosted the processes, that delineated pieces of the sea for different use, created user groups, established rules, authorized patrols or determined, individually, who would be the direct beneficiaries of a project.

Ultimately, there were 4,080 direct beneficiaries (2,394 men, 1,686 women) from activities supported by CEPF grants during Phase II and an estimated 34,000 indirect beneficiaries (22,800 men, 11,200 women). The imbalance between men and women is a reflection of the people primarily engaged in marine natural resources management. Direct monetary benefits were, predictably, modest, given the absolute earning power of people living in coastal communities, and the time it takes to realize benefits from a recovering fishery, nascent supply chain or small enterprise with fisheries byproducts. Nevertheless, beyond potential future earnings, benefits included:

- Formal control of resources by local communities previously at the mercy of the larger state, commercial fleets or outside fishers.
- Formal control of resources by *adat* communities previously not recognized by the Indonesian administrative state.
- Improved decision making in the management of state-owned MPAs and fishing zones.
- Access to individual and shared supplies (fishing gear, boats, motors, weighing scales, ice coolers and refrigeration, processing tools, etc.).
- Access to benefits from licensing and formalization, particularly state-provided health and life insurance.
- Access to buyers of ocean products that meet various sustainability measures, particularly in relation to fishing gear.
- Access to training in cooperative governance, fishing practices and post-catch processing.
- Support by government for safe landing zones and more sanitary markets.

3.9 CSO capacity building and networking (Phases I and II)

In Phase II, 45 unique groups, including Burung Indonesia, received grants. Of these 18 had received grants in Phase I. Apart from Burung, the only organization to only receive large grants was the Coral Triangle Center. The other 16 organizations all "graduated" from small to large grants somewhere along their journey with CEPF between Phase I and Phase II, reflecting their growth as organizations.

Capacity building was a focus of CEPF grant making during both phases, with a Strategic Direction 6 devoted to this topic. During Phase I, Burung engaged Yayasan Penabulu, an organization that got its start as Indonesian civil society rapidly developed in the post-Suharto years of the early 2000s, to help guide this part of the portfolio. Penabulu used its own assessment and design tool, called PERANTI, to provide training in organizational foundations, governance, management and sustainability.

In parallel, CEPF used the civil society tracking tool (CSTT) to monitor whether its grantees had undergone changes in organizational capacity over the duration of its support. The CSTT tracks changes in five dimensions of capacity: human resources; financial resources; management systems; strategic planning; and delivery (of results). Of the 51 CSOs that completed a baseline and final assessment using the CSTT in Phase I, 23 reported a meaningful overall positive change in capacity. Separately, per the PERANTI tool, organizations saw the greatest increase in sustainability (i.e., the ability to raise more funds for themselves and projects), followed by governance (i.e., how decisions are made, including internal and external/board leadership).

Separately, there was an element of networking in Phase I, with support to Yayasan Kehutanan Masyarakat Indonesia (YKMI): a national forum of Indonesian CSOs engaged in community forestry. CEPF made a grant to YKMI to allow its members to coalesce and agree on final recommendations to revise the national forestry and biodiversity law. Separately, grants to local groups working in Wallacea allowed them to participate in this national network.

A key lesson from Phase I, therefore, was that there was a strong demand for both technical capacity building and longer-term organizational development among local CSOs in Wallacea. Given that many of the organizations that received grants in Phase I were, fundamentally, community development organizations (as opposed to conservation organizations), they needed training in technical issues and a better understanding of conservation and sustainable use of biodiversity as a foundation for sustainable rural livelihoods. The main findings of Phase I carried into Phase II:

- Local CSOs and community partners need conservation knowledge to properly value environmental goods and services and incorporate these into their economic plans.
- CSOs benefit from the ability to partner with government agencies, to relay results in their terms and to serve as a trusted mediator with communities.
- CSOs frequently have the motivation to work towards conservation goals but benefit from the ability to articulate these goals into workplans and targets for measuring progress.
- Skilled financial, administrative and operational managers, and people who understand information management and human resources management, are a valuable commodity inside CSOs. The inevitability is that such people are frequently recruited elsewhere, meaning there is a need for: (i) strong policies and procedures that outlast individuals, and (ii) a continued pipeline of training in these areas.
- CSOs benefit from continued growth as communicators: to donors in the form of proposals; to government in the form of advocacy; and to the public in form of awareness raising and social change. Each requires a different set of skills.

The investment strategy for Phase II recognized the continued need for this, particularly given the technical and geographic focus of the grants. Fisheries management, by itself, is a

complex topic. However, the recipients of CEPF grants might not be fisheries experts but instead be conservation or community development groups. The investment strategy anticipated this, and CEPF supported various forms of training and mentorship, including:

- Engagement of Yayasan Masyarakat dan Perikanan Indonesia (MDPI), which specializes in training CSOs and community groups in fishery management. MDPI brought a representative of virtually every grantee or community in the CEPF portfolio to its permanent training center in Bali, or otherwise engaged them via two regional, in-person trainings, two online trainings and several field-based exchange visits. Between MDPI and other efforts, ultimately 220 people received training in some aspect of fisheries management.
- Engagement of Asosiasi Perikanan Pole and Line dan Handline Indonesia (AP2LHI), which provided mentorship to other groups as it brokered relationships between community fishers and buyers seeking sustainably sourced products.
- Support for grantees and communities to participate in Jaring Nusa, the network of sustainable fishing groups in Wallacea. This network enabled them to share experience and approach buyers of their products.

Furthermore, Burung Indonesia had a mandate to provide more mentorship and training opportunities for grantees. This included support for them to participate in provincial government-sponsored fisheries co-management committees and in the national *Jaring Nusa* community-based fishery network.

The results are evident from the CSTT scores. During Phase II, 38 organizations completed a baseline and final CSTT, of which 30 showed a meaningful improvement, by a median of 19 percent.

Finally, Burung had a mandate to build its own capacity as an organization that can manage its own finances, grow its own finances, and re-grant donor funds. Over Phase II, Burung:

- Maintained its seven-member management board and four-member supervisory board.
- Employed 76 full- and part-time staff.
- Worked in 11 provinces and 169 *desa,* with permanent offices in Bogor (Java), Gorontalo and West Flores.
- Purchased its own land and office in Bogor.
- Maintained a membership of 155 dues-paying members.
- Received US$2.5 million in revenue in 2023.
- Secured unrestricted revenue of 21 percent in 2022, with a goal of raising 33 percent of revenue from membership dues.
- Maintained reserve funds of US$500,000, sufficient for six months of staff salaries and third-party obligations, in compliance with Indonesian law and on par with international partners.
- Maintained a balanced age structure within the organization, with roughly one-third of staff members born in each decade from the 1970s to the 1990s, creating conditions for leadership succession.
- Managed the Hutan Harapan conservation forest (Jambi province, Sumatra) as a separate enterprise with an additional 207 staff.

At the close of Phase II, Burung was in a good position to continue serving as the RIT, with strong capacity on its own and the ability to lead other organizations. There were multiple other strong partners that could build the capacity of others, or that could implement complex grants.

3.10 Lessons from Phase I and Phase II

Many of the lessons from Phase I still remain relevant to the next phase of investment, particularly as many were based on the experience of grantees working on terrestrial conservation. Those are repeated here, albeit in an abbreviated fashion:

1. **Geographic prioritization remains important for efficiency and impact.** Even at the level of a corridor or a KBA, let alone an entire hotspot, CEPF grants (often less than US$125,000 in value) can be lost if scattered too widely. A focus on continuity, contiguity and technical complementarity of grants around a geography creates greater opportunity for success and also signals to government partners a commitment by CEPF. This was true for Phase I, and was evident again in Phase II, where the large, government-managed MPAs benefited from being surrounded (sometimes literally) by CEPF grantees.
2. **Networks remain essential for CSOs**. In Phase I, CEPF grantees benefited from the Indonesian Community Forest Conservation Forum (YKMI), which helped CSOs in Wallacea to align with a nationwide movement to improve community rights to public land, and from AMAN, an Indigenous people's network. In Phase II, this continued with Jaring Nusa, not to mention the network of CEPF grantees under the leadership of Burung Indonesia.
3. **Build coalitions to focus on the big picture**. Various partners, including Burung Indonesia, as well as some of the larger national NGOs, and not to exclude international organizations that might not receive CEPF funding, can engage partners at the MMAF and the Ministry of Forestry and Environment, as well as multinational corporations and private and public donors, to take wholesale action. In Phase I, this saw multiple groups working to reform Indonesia's list of protected species, while in Phase II, there were nationwide efforts to show that artisanal fisheries could generate meaningful national revenue, creating the argument for sustainable practices.
4. **Capacity building and organizational development remain relevant**. The need for capacity building, like basic education, will not disappear anytime soon. Working with specialized organizations (e.g., Penabulu on organizational development, IDEP on sustainable agriculture, YKMI on fisheries) is a proven option. Further, the growth of several partners over the two phases has shown that investment in particular groups pays dividends. Grantees from Phase I and Phase II, like Manengkel, Barakat, Lembaga Partisipasi Pembangunan Masyarakat, Yayasan Tana Ile Boleng, Yayasan Bina Sejahtera Baru, Yayasan Pengkajian dan Pengembangan Sosial, and Perkumpulan Relawan untuk Orang dan Alam, not only grew with CEPF support but received funds from other donors or formed partnerships with government independent of Burung Indonesia's engagement. These groups grew dramatically from when they each received small grants in Phase I. To the extent possible, future funding should find the next cohort of organizations like these.
5. **Community-based management of natural resources remains a focus for many CEPF grantees**. Given the typical size and duration of CEPF grants in Indonesia (around US$125,000 over 24 months) and the site-based focus of the

work, CEPF faced challenges in Phase I when attempting to engage the private sector as a partner or in an effort to reform its practices. This resulted in dropping Strategic Direction 5 (private sector engagement) from the investment strategy for Phase II and incorporating it opportunistically into grants falling under other strategic directions. There were similarly modest results during Phase II, when the state oil company, Pertamina, and a private company called Danone Aqua contributed corporate social responsibility money to support project activities but the companies themselves did not change their own practices.

6. **Local "ownership" of resources remains critical, regardless of how an area is designated**. The economic principles of natural resource management applied equally well to the terrestrial grants in Phase I as they did to the marine grants in Phase II, most notably that, when people own a resource and have a stake in it, they are more likely to conserve it. Projects that helped communities to get their rights over natural resources recognized were the most successful. In Phase I, this took the shape of communities having the right to cultivate coffee inside of Kelimutu National Park, and, in Phase II, of fishing groups having the right to fish in an area of sea at certain times of the year.
7. **Strong local management institutions are key**. While the focus of CEPF is and will remain on legally designated CSOs, as the organizations receiving grants, there are other informal, community-based organizations with which CEPF must work, either directly or indirectly. These include community-based producer organizations (e.g., fishery management cooperatives and agricultural *kelompoks* (groups)), as well as protection groups (e.g., the *pokmaswas* for community environmental surveillance, "coastal watch" groups). They also include community advisory councils, traditional elders' groups, and mosque, church and school-based bodies. While only certain types of CSO have the prerequisites to receive grants, all these local groups have a role to play in conservation. Appropriately empowering them remains vital.
8. **Community welfare remains a critical piece of the puzzle, to achieve lasting conservation results.** This lesson from Phase I carried into Phase II and continues to apply, namely that communities with limited opportunities for income need to be given alternative options to unsustainable natural resource use, not simply exhortations for conservation. Even as communities understand the long-term value of an open-closed fishery, a restored mangrove or a healthy forest for watershed protection, there are still immediate needs for food, health, housing and education that need to be met. The most successful grants during Phase II provided for small enterprises using fishery byproducts, support for community cooperatives in fishing communities, and support for sustainable harvest of nonthreatened species of crabs and sea cucumbers.
9. **Engagement of government is critical, as is putting results in government terms.** In Phase I, successful projects placed community and CSO plans purposefully in the context of official village development plans or district spatial plans, which not only ensured endorsement of the work but, in some cases, led to small allocations of public funds. In Phase II, this lesson continued to be relevant, as grantees ensured that fishing groups participated in provincial fisheries co-management committees under the auspices of MMAF. Grantees also supported public MPA managers to report using the official MMAF MPA monitoring tool, EVIKA. Using this tool, MPAs with community engagement or CSO co-management have had consistently higher scores than those without.

There were further particular lessons from Phase II.

10. **Replicating to neighboring communities is easy, whereas replicating to higher levels of government is difficult.** When given more funding, many CSOs had an easy time making links to communities up and down the coast. However, they struggled when trying to get provincial or national government support for new approaches. There is a continued role for the RIT or larger organizations to help local CSOs engage with decisionmakers in government.
11. **The collateral success of grants takes many forms**. Outside of project results frameworks, grantees began successfully marketing their communities as tourism attractions for "traditional" management, for "green" economies that provided sustainably caught fish to local restaurants, and for turtle hatcheries and mangrove nurseries.
12. **Monitoring of marine species, KBAs and coral reefs remains beyond the capacity of many grantees**. For CSOs without marine biologists on their teams, monitoring marine species or KBAs is difficult. There may be a need for specialized or third-party grantees to provide an independent monitoring function, rather than relying on local CSOs working at the community level to do this.

3.11 Lessons from the independent evaluation of the RIT

In 2024, CEPF commissioned a consultant to undertake an independent evaluation of lessons learned by the Wallacea II RIT during Phase II and to provide recommendations for the next phase. The consultant interviewed CEPF Secretariat staff, grantees, government representatives and other stakeholders (including donors) to evaluate Burung Indonesia's performance in relation to seven elements of the standard RIT terms of reference: coordination; biodiversity mainstreaming; communication; capacity building; solicitation and review of large grants; management of small grants; and monitoring and evaluation. The evaluation was based on seven criteria and found the following in terms of each:

1. **Relevance**: Burung Indonesia ensured strong alignment in awarding grants that met both conservation priorities and local needs.
2. **Efficiency**: Burung used its relationships with CSOs and government to ensure efficiency.
3. **Effectiveness**: Burung was effective at engaging with partners throughout the life cycle of the grant.
4. **Coverage**: Burung's guidance ensured grants that worked across diverse geographies and themes.
5. **Impact**: Burung was able to coordinate the grants so that the whole was greater than the sum of its parts. Grantees rarely worked on their own but, instead, because of Burung, received awards that purposefully complemented other work.
6. **Accessibility**: Burung's presence in Bogor and at three locations throughout the hotspot lowered barriers for local CSOs to engage in donor-funded conservation.
7. **Adaptive Management**: Burung's presence in the field, and its engagement with the donors, further allowed for flexible and real-time adjustments to project plans.

3.11.1 Lessons and their application to Phase III

1. **Relationships drive success.** Burung Indonesia's strength lay in its deep contextual knowledge and relationships. Its field presence, responsiveness and

mentoring were consistently praised by grantees, donors and government partners. This approach helped build trust, especially with grassroots organizations. Phase III will benefit from a continued field presence and frequent travel by the RIT to grantees.

2. **Capacity building is transformative.** Grantees, all local CSOs, reported significant growth in their technical, financial and strategic capacities. Burung's support helped them navigate CEPF's systems, improve project design and engage more effectively with stakeholders. Phase III will benefit from a continued emphasis in this area, whether by Burung personnel, consultants or third parties.
3. **Accessibility matters.** The RIT played a crucial role in making CEPF funding accessible to small and emerging organizations. Its inclusive and non-intimidating approach enabled broader participation and strengthened local ownership of conservation efforts. The implication for Phase III is to give lower capacity organizations, working at a slow pace, the opportunity to engage in the proposal and award process.
4. **Administrative complexity is a barrier.** For local CSOs, the requirements of CEPF are relatively complex. Burung was required to flow down these requirements to recipients of small grants. The implication for Phase III is for Burung to work with the CEPF Secretariat to ensure that the management of the small grant mechanism (including the small grant agreement template and small grant operational manual) is done in a way that minimizes the administrative burden on grantees.
5. **Adaptive management is a core strength.** Burung Indonesia demonstrated flexibility in responding to changing field conditions, including political shifts and natural disasters. This adaptability helped grantees stay on track and adjust their strategies when needed. The implication for Phase III is, among others, to ensure continued good relationships with government at national, provincial and *kabupaten* levels, and to avoid committing too much money too early in the portfolio.
6. **Staff training and delegation ensures smooth operations.** CEPF has a complex program design, reflected in a sophisticated and online grant management system, and operational rules that are also not trivial. The implication for Phase III is that the RIT will benefit from deeper and broader training by the CEPF Secretariat to allow more of the field team to contribute to management of the grant portfolio.

3.11.2 Recommendations for the RIT in Phase III

The independent consultant made several recommendations for a future RIT. To the extent that constraints of budget, time and policy allow, the CEPF Secretariat and future RIT should work together to:

1. **Streamline administrative processes,** including simplifying financial reporting, disbursement and grant closure procedures, especially for small grants. This will require investing in dedicated staff and user-friendly tools to reduce delays and improve efficiency.
2. **Strengthen post-training support,** including moving beyond one-off training events by offering structured follow-up, mentoring and peer learning opportunities. This will help sustain capacity gains and deepen impact.
3. **Improve internal continuity,** including building team-wide capacity to manage adaptive decisions and stakeholder relationships. This will require better onboarding, documentation and delegation to reduce reliance on individual staff.

4. **Enhance communication and visibility,** including sharing success stories, lessons learned and policy contributions more widely, especially with government, private sector and the public. This can boost awareness of and support for conservation.
5. **Foster collaboration among grantees** by creating opportunities for grantees to connect, share experiences and collaborate, such as corridor-level convenings or thematic learning clusters. This can amplify collective impact.

4. BIOLOGICAL IMPORTANCE OF THE HOTSPOT

4.1 Geography

The Wallacea Hotspot is located in the islands of the Indonesian archipelago and Timor-Leste, between the Sunda and Sahul continental shelves (White and Bruce 1986). The region is named after Alfred Russel Wallace, who spent years collecting specimens of flora and fauna within the region (described in his book, *The Malay Archipelago*, Wallace 1869). He noted that its fauna was distinct in many ways from the Oriental biogeographic realm to the west and the Australian biogeographic realm to the south and east (Monk *et al.* 1997).

The western boundary of Wallacea, the Wallace Line, which runs to the east of Borneo and Bali, and to the west of Sulawesi and Lombok, to separate some groups of Asian fauna from the Australian fauna. The division does not apply perfectly to all taxonomic groups but it is sufficiently distinct for birds and non-flying mammals for it to be recognized as an important biogeographic feature. The line marks the western limits of the distribution of marsupial mammals, cockatoos and several other bird families. The equivalent line at the eastern edge of Wallacea is the Lydekker Line, which runs to the east of Maluku (Halmahera, Seram, Kai and Tanimbar) and the Lesser Sundas (Timor), and to the west of New Guinea, with Australia outside Wallacea to the south (Monk *et al.* 1997, White and Bruce 1986). The locations of boundaries within this ecologically complex archipelago have been the subject of debate, with Weber proposing that, for mammals, the true boundary between the Australian and Oriental realm lies along a line running east of the island of Timor and west of Buru, dividing Sulawesi and the Lesser Sundas from Maluku. CEPF uses CI's definition of the Wallacea Hotspot, using the Wallace and Lydekker lines (Figure 1).

The hotspot corresponds to the whole of the Republic of Timor-Leste and the Indonesian provinces of Nusa Tenggara Timur, Nusa Tenggara Barat, Maluku and Maluku Utara, and the island of Sulawesi (six provinces), departing from these administrative boundaries only in that the Aru Islands and the small island of Gebe, administratively part of Maluku, are outside of Wallacea.

Wallace's line does not apply to marine species, as it cuts through the marine ecoregions where the archipelago is located. However, the region, along with the island of Papua to the east, is at the heart of the Coral Triangle: a region that has the richest marine biodiversity on Earth (Huffard *et al.* 2012).

The total land area of Wallacea is 33.8 million ha, and this area can be divided into three biogeographic subregions: Maluku; Lesser Sundas; and Sulawesi (Coates and Bishop 1997). The Maluku subregion covers the island groups of Halmahera, Bacan, Obi, Seram, Buru, Banda and Kai, with a total land area of 7 million ha. In the Lesser Sundas subregion, the main islands are Lombok, Sumbawa, Sumba, Flores, Tanimbar and Timor, totaling 8.1 million ha. The largest land mass in the region is the island of Sulawesi, covering 18.6 million ha and accounting for more than half of the total land area of the hotspot. The Sulawesi subregion includes the islands of the Sangihe-Talaud archipelago, and the Togean, Banggai and Sula islands. Timor island, which is in the Lesser Sundas biogeographic subregion, is administratively divided between the Republic of Indonesia and the Republic of Timor-Leste.

There are some areas of difference between administrative and biogeographic subregions. For example, the Sula Islands (Mangole, Sanana, Taliabu and surrounding islands) are biogeographically part of the Sulawesi subregion but administratively in Maluku Utara province.

4.2 Geology

The land area of Wallacea is fragmented into over 6,000 islands, almost all of them less than 1 million ha in area. This characteristic has had a defining influence on the region's biodiversity, and its social, political and economic landscape (Monk *et al.* 1997).

The complex, fragmented geography of Wallacea is a reflection of an equally complex geological history. The islands and oceanic trenches of the region are partly the result of folding caused by collisions between continental plates, and partly a result of subduction and volcanic activity. They can be divided into four types:

- Inner volcanic arc islands: the Sunda and Banda arcs together stretch from Lombok to the Banda Islands and include Lombok, Sumbawa, Komodo, Flores, Solor, Adonara, Lomblen, Pantar, Alor, Atauro, Wetar, Romang, Damar, Teun, Nila, Serua, Manuk and the Banda Islands. These are young oceanic volcanic islands, usually ringed by limestone or other sedimentary materials.
- Outer arc islands: the islands of the Outer Banda Arc include Raijua, Sawu, Rote, Semau, Kambing, Kisar, Leti islands, Kai islands, Watubela islands, Gorong islands and Seram Laut. They are nonvolcanic and are geologically related to the Australian continent.
- Continental crustal fragments include Sumba and Timor in the east Lesser Sundas, the Banggai-Sula Islands, Obi, Bacan, Buru, Seram and Ambon.
- Composite islands (composed of two or more islands from different sources that have joined together) include Sulawesi and most of the islands in Maluku Utara: Halmahera, Morotai, Makian, Moti, Tidore and Ternate.

Some islands are separated by shallow seas from larger land masses and were connected by land bridges to Australia and New Guinea at times when the sea level was lower. Others have formed in isolation. This has fundamentally affected which species have been able to colonize them. The marine basins between the island arcs may be as deep as 7,000 m, and are swept by powerful currents, known as the Indonesian Throughflow, as water flows from the Pacific to the Indian Ocean. These channels form a barrier to dispersal of terrestrial species but the currents are so strong that they are also an obstacle to the dispersal of marine species, isolating populations and contributing to the evolution of the globe's most species-rich marine ecosystems. The geological history of Wallacea is summarized in Table 5.

Table 5: Summary of geological timescale and events related to the Wallacea Hotspot over the last 350 million years

Era	Millions of Years Ago Ended	Geological Events	Biological Events
Cenozoic	0.01		Modern humans, human's earliest ancestor
	1	Microcontinents into final position, Australia continental margin collides with Indonesia Arc	Large carnivores
	10	Sorong Fault created, rafts move westward; Banda Arc bends westward; Inner-Arc islands begin to appear	
	10	Australian continent collides with eastern end of subduction zone; Proto Banda Arc created	
	10	Possible connections with Borneo either via Doang-doang shoals or a reduced Makassar Straits	
	25–60	Sula/Banggai together with eastern Sulawesi collide with western Sulawesi; northern peninsula starts rotating; eastern and western Sulawesi begin to fuse; widespread volcanism in western Sulawesi	Abundant grazing animals
	25–60	Western Indonesia and western Sulawesi in more or less present positions	Grasses and composites increase; large running animals
	20–60	Australia breaks away from Antarctica; volcanism in western Sulawesi begins	Many modern types of mammals evolve; grasses increase
	20–60	Java Trench subduction zone begins south of Sumatra, Java, Bali, Lombok, Sumbawa	First placental mammals
	70	Arafura Sea develops as continental margin below sea level	First flowering plants (coal forming); extinction of dinosaurs and ammonites at end of period
Mesozoic	145–250	Western Indonesia with Tibet, Myanmar, Thailand, Malaysia and western Sulawesi break away from Gondwanaland	First bird and mammals; dinosaurs and ammonites abundant
	145–250	Pangaea rifts into two: Laurasia and Gondwanaland; insular and some mainland parts of Southeast Asia part of eastern Gondwanaland	First dinosaurs; abundant tree ferns and conifers
Paleozoic	251–350	Continental slivers calve off incipient Australia and cross Tethys Sea northward	Extinction of many forms of marine animals including trilobites
	251–350	All land together as one continent, Pangaea	Abundant tree ferns; first reptiles; land insects; sharks and amphibians abundant

Source: Monk *et al.* (1997), Whitten *et al.* (1987).

4.3 Climate

The climate of the northern part of Wallacea is equatorial, with a double-peaked wet season, but more monsoonal in the south, with a single rainy season and a long dry season (Coates and Bishop 1997, Monk *et al.* 1997). The Lesser Sundas and Maluku are highly influenced by the west and northwest monsoon and trade winds that bring the rains from December to February. During July and August, the southeast trade winds bring dry air from the Australian land mass, resulting in a period of cool, dry weather in the Lesser Sundas. Wind speeds drop and temperatures rise in October, which is usually the hottest season in Wallacea (Coates and Bishop 1997).

Within the general pattern of the seasons described above, there is local variation, especially on small islands with steep topography. In Timor-Leste, the north coast experiences a four-to-six-month wet season with a single peak of rainfall, while the south coast has a bimodal pattern with a longer wet season and peaks in December and May. Higher areas have up to twice the rainfall of the coastal zones (Barnett *et al.* 2007). The average rainfall varies from 500–1,000 mm per year in the Lesser Sundas to 3,500–4,000 mm per year at the equator in northern Sulawesi and Halmahera (Coates and Bishop 1997, Monk *et al.* 1997).

The daily temperature range throughout the year in this region is between 21 and 34°C, with little seasonal variation, while the relative humidity is always high at dawn (above 90 percent) and reduces to 50 to 60 percent in the afternoon (Coates and Bishop 1997, Monk *et al.* 1997). The combination of low rainfall, high winds and high temperatures makes Nusa Tenggara the driest subregion in Indonesia.

Wallacea experiences variations in the timing and quantity of rainfall as a result of El Niño Southern Oscillation cycles but the effects vary depending on local climatic patterns. In Timor-Leste, some areas get 50 percent of their normal annual rainfall in El Niño years, while other areas receive more than average. All areas experience a delay in the rains, however, with implications for food security and health (Barnett *et al.* 2007).

4.4 Habitat and ecosystems

4.4.1 Forests

In 2019, forests covered 16.8 million ha (MOEF 2020), just under half the land area of Wallacea. Forty percent of this, 6.7 million ha, was categorized as primary forest. This represents a loss of forest cover of 0.8 million ha, or 4.8 percent, since 2011. Interestingly the area of forest categorized as primary has increased significantly, from 5.2 million to 6.7 million ha. This may reflect changes in methodology for forest assessments but may also be the result of secondary forests regrowing to form a closed canopy. Table 6 shows the breakdown of land cover in Wallacea by area and as a percentage.

Table 6: Change in forest area in Wallacea, 2011-2019

	Area in 2011 (ha)	Area in 2019 (ha)	Change (ha)	Percent change
All forest	17,700,000	16,857,000	- 843,000	- 4.8
Primary forest	5,200,000	6,732,000	+ 1,532,000	+ 29.5

There are significant differences in forest cover across the region. In Indonesian Wallacea, Sulawesi has 55 percent of the forests, Maluku 30 percent and the Nusa Tenggara 15 percent. However, Maluku is the most heavily forested subregion, with 63 percent of the land area forested, compared to 49 percent in Sulawesi and 38 percent in Nusa Tenggara. Timor-Leste is 50 percent forested, according to FAO Global Forest Assessment (2010) figures. These data are subject to debate and the real figure may be much lower.

At a provincial level, Sulawesi Tengah stands out for its forest cover. The province has 3.8 million ha of forest, and, although it is the largest province in Wallacea, at 6.1 million ha, this still amounts to almost 62 percent forest cover, meaning that this province alone has 22 percent of all Wallacea's forests. Two other provinces have more than 2 million ha of forest: Maluku Utara; and Maluku. At the opposite extreme, Sulawesi Utara has the smallest area of forest (0.5 million ha or 3 percent of the Wallacea total), although the least forested province is actually Sulawesi Selatan, which at 31 percent forest cover is lower than Nusa Tenggara Barat or Nusa Tenggara Timur.

Patterns and rates of deforestation are discussed in more detail in Chapter 9 (Threats). The main types of forest found in Wallacea are described briefly below.

Lowland evergreen and semi-evergreen forests
Evergreen and semi-evergreen forests are the natural vegetation of the lowlands of the equatorial tropical zone in Wallacea and are, thus, concentrated in Sulawesi and Maluku. In the Lesser Sundas, evergreen forests are limited to south-facing slopes of the southern coasts of islands such as Sumba, Sumbawa and Flores, where the southeast trade winds bring sufficient moisture during the dry season.

Lowland forest is the most productive and diverse of all terrestrial ecosystems and grows in areas with a minimum annual rainfall of 2,000 mm. Trees reach 30 m or more in height, with emergents up to twice that height. The forest interior is rich in thick-stemmed lianas and in woody as well as herbaceous epiphytes (Whitmore 1984). While the lowland forests of western Indonesia are dominated by trees of the Dipterocarpaceae, this family is represented by only six species in Sulawesi; forests in Wallacea are not dominated by one family of trees but show considerable variation from place to place (Whitten *et al.* 1987). Ebonies (*Diospyros* spp.) form dense clumps in some lowland forests but have been the target of intensive exploitation. One endemic dipterocarp, the Critically Endangered *Shorea selanica*, forms the dominant canopy species in the lowland forests of Seram, Maluku (Monk *et al.* 1997).

Lowland monsoon forest
Monsoon forest is formed in more seasonal climates than evergreen forest; it is the dominant forest type in the Lesser Sundas subregion, which is the driest and most seasonal subregion in Wallacea. Much of this forest type has been cleared for swidden agriculture and, in some cases, for mining and other development. In Sulawesi, monsoon forest is confined to small areas of the southeast peninsula and Buton island (Whitten *et al.* 1987).

Monsoon forests can be classified into four types according to the intensity of the seasonality:

- Dry evergreen forest: hard-leaved evergreen trees predominate, e.g., *Schleichera oleosa*.

- Tropical moist deciduous forest: more than 50 percent of trees are deciduous, but subdominants and lower story plants are largely evergreen.
- Tropical dry deciduous forest: entirely deciduous.
- Tropical thorn forest: deciduous with drought tolerant xerophytes and low thorny trees predominating, especially *Acacia* spp. This forest type is now scarce in the Lesser Sundas but can be found in southeastern Lombok and southwestern Sumbawa.

Lowland monsoon forests are typically dominated by *Pterocarpus indicus* and also contain the remaining stands of sandalwood (*Santalum album*), a tree that has been heavily exploited historically.

Montane forests and montane vegetation
Tropical montane forest is generally found above 900 m. Tree species include conifers such as *Podocarpus*. Above about 2,400 m, the forest is replaced by *Rhododendron* scrub and *Vaccinium* heath with tree ferns and, in the highest areas, grasslands and herbs. Some 20 percent of Sulawesi is within the montane forest biome, including important centers of plant endemicity in Latimojong (Sulawesi Selatan) and Bogani-nani Wartabone National Park.

In the drier Lesser Sundas, the *Podocarpus* montane forests give way to *Casuarina* above 2,700 m, and in the driest regions, such as in Timor-Leste, to *Eucalyptus urophylla*, which is now cultivated widely as an industrial tree crop. However, information on its distribution and status in natural range is limited (Monk *et al.* 1997).

Other forest types
Heath forest or *kerangas* occurs on podzolic soils and has a low or medium canopy (10–30 m) and a uniform structure, with small-stemmed, drought-tolerant trees. Heath forest occurs in limited areas in Maluku and the Lesser Sundas, as well as on Taliabu in the Sulawesi subregion.

Swamp forests, freshwater swamp forests or peat swamp forests occur in limited areas throughout Wallacea where conditions are suitable. Extensive swamp forests can be found in Yamdena, Tanimbar islands, and Rawa Aopa Watumohai, Sulawesi. Smaller areas of swamp forest occur along watercourses and the inner margins of coastal mangrove swamps throughout the hotspot. Sago swamp forests are of economic and cultural importance, as they provide the traditional stable food for much of Maluku.

Forest on ultrabasic rocks are usually less species rich than other forest types. Ultrabasic rocks are rich in iron, magnesium, aluminum and heavy metals but low in quartz and silica content (less than 45 percent). The soils are unsuitable for agriculture but may be targeted for mining. This forest type is found in the Lesser Sundas and Maluku, on Timor, Leti, Ambon, Seram, Obi, Bacan and Halmahera (Monk *et al.* 1997).

Savannas and grasslands are found throughout Wallacea in the driest areas but are extensive in the Lesser Sundas. They are influenced by fire and, in areas with a tradition of livestock herding, are managed and form an economically important resource. Savanna is dominated by an open forest canopy and an understory of mixed grasses and herbs. Most of tree species that occur in savanna are monsoon forest species, and savannas can be classified into eight types based on dominant tree species: *Albizia chinensis* savanna; palm

savanna dominated by *Borassus flabellifer* or *Corypha utan*; *Eucalyptus alba* savanna; *Melaleuca cajuputi* savanna; *Acacia* savanna; *Casuarina junghuhnianaf* savanna; Ziziphus *mauritiana* savanna; and *Tamarindus indicus* savanna.

4.4.2 Karsts

Limestone erodes rapidly, especially in high-rainfall areas, producing steep cliffs, exposed rocks, pinnacles and caves. The unique conditions within karst environments, especially within cave systems, and their isolation from other systems have encouraged speciation and led to the evolution of a highly specialized endemic fauna. Outside the caves, the calcium-rich soils and plants support diverse and often endemic snail and lepidoptera faunas. Many karst specialist species are likely to be threatened but have yet to be assessed against IUCN criteria. The trees in karst forests are smaller than those in lowland forests, because of the shallow and nutrient-poor soils, and tree species diversity is low. The difficult topography and infertile soils give karst areas some protection against clearance but they are targeted for limestone quarries and susceptible to pollution and abstraction of water. The main karst areas in Wallacea are in central Halmahera, Buru and Seram in Maluku subregion, Muna and Maros in Sulawesi (Whitten *et al.* 1987, Monk *et al.* 1997).

4.4.3 Freshwater rivers and lakes

Nowhere in Wallacea is further than 100 km from the coast, and rivers in the region are typically short, steep and prone to extreme fluctuations in flow over the year. On small islands, water supply and the management of water catchment areas is critical for livelihoods and economy. Many islands in Wallacea, including larger ones such as Lombok, Wetar, Timor, Sumba and Buru depend on one highland catchment near the center of the island for the majority of their water. The limited extent of lowland areas in the region means that there are few large freshwater swamp areas, the largest being Rawa Aopa in Sulawesi Tenggara (11,407 ha).

The Lesser Sundas and Maluku have relatively few lakes, most of them volcanic in origin, including Segera anakan (Lombok), Kelimutu (Flores) and Satonda (Sumbawa). Sulawesi, in contrast, has 13 lakes over 500 ha in area, including the second and third largest in Indonesia (Towuti and Poso), and the deepest in Southeast Asia (Matano, 590 m) (Whitten *et al.* 1987). These deep, isolated lakes were created as a result of Sulawesi's complex tectonic history and all support endemic fishes, shrimps and other fauna.

4.4.4 Coral reefs

The main types of coral reefs are fringing reefs, which closely follow the shoreline, barrier reefs, which are similar to fringing reefs but further from the shore, and atolls, a ring-shaped reef that develops around a slowly subsiding volcanic island and may be far from the shore. Coral reefs play an important role as a habitat for marine fauna and flora, providing nursery grounds for many juvenile fish, and as a source of nutrients and a variety of foods. The reefs of Wallacea are at the heart of the Coral Triangle, and although the most species-rich reefs ever recorded are just outside the eastern boundary of the hotspot in West Papua, the reefs of Wallacea are also exceptionally species-rich. They play a vital role in fisheries and local livelihoods.

Distribution of coral reefs is influenced by light, sedimentation, substrate, salinity, wind and tidal patterns. Coral reefs occur throughout Wallacea, with fringing reefs along the coasts of all islands, wherever local conditions are suitable. However, in many areas, a combination of destructive fishing practices, sedimentation, water turbidity and periodic increases in sea water temperature have killed the coral and resulted in the erosion of the reef structure. Significant areas of healthy coral reef in the Lesser Sundas are in Komodo-Rinca and the islands between east Flores and Alor, in Sulawesi at Taka Bone Rate, Kapoposang, Wakatobi, Togean, Banggai and around the islands of Sulawesi Utara. In Maluku, important coral reef areas are around the islands of the outer Banda Arc, Seram-Buru, the Southern half of Halmahera to Bacan and Obi (Monk *et al.* 1997, Whitten *et al.* 1987).

4.4.5 Seaweed and seagrass beds

Seagrasses are aquatic flowering plants (Angiospermae) that have adapted to live in shallow seas where there is enough light and an appropriate substrate. They form highly productive ecosystems that sequester large volumes of carbon. Seagrass beds function as nursery grounds for many invertebrates and juvenile fish and provide feeding grounds for fishes, mollusks, green sea turtle (*Chelonia mydas*) and dugong. They also stabilize offshore sand reservoirs, act as sediment collectors and prevent coastal erosion.

Indonesia has around 1.7 million ha of seagrass (Ministry of Forestry and KKP 2010). Seagrasses reach their largest extent in shallow seas, and so are widespread in the Arafura sea, outside the southeastern boundary of the hotspot, and in the Java sea, outside the western boundary. Nevertheless, Wallacea and especially the Lesser Sundas have more than 700,000 ha of seagrass concentrated in shallow coastal waters that are free from intense wave action or sedimentation.

4.4.6 Mangroves and other coastal habitats

Intertidal habitats include mangroves, beaches, rocky coasts and estuaries. Local geology and currents influence what type of coastal habitats predominate. These habitats can be highly productive and are often important for local economies. Sandy beaches are nesting grounds for sea turtles, while tidal sand and mud flats are important feeding grounds for migrating shorebirds.

Mangroves consist of trees that have adapted to live in the intertidal zone in tropical and subtropical regions. Typically, mangroves are found in zones parallel with the shore, with different species and growth forms as a result of the influence of tides, salinity, substrate, freshwater runoff and seepage, and wave exposure (Sukardjo 1993, Monk *et al.* 1997). The dominant genera in the zones are usually *Avicennia*, *Sonneratia*, *Rhizophora, Bruguiera, Ceriops, Heritiera* and *Lumnitzera* (Monk *et al.* 1997).

Mangroves occur all around the coastlines of Wallacea where conditions are suitable, but rarely form large stands. Important mangrove areas occur at the head of the Bone Gulf in Sulawesi, Kupang Bay and Sumba island (Huffard *et al.* 2012). Kupang Bay also has inter-tidal sand and mud flats that are seasonal feeding grounds for internationally important numbers of migratory shorebirds (Trainor and Hidayat in prep. 2013).

4.4.7 Offshore waters and seamounts

Bounded by two continental shelves, Wallacea is characterized by chains of islands connected by shallow seas, separated by deep trenches up to 7,000 m deep. These deepwater areas may be close to the shore and provide feeding, breeding and migratory corridors for whales and other cetaceans and large populations of pelagic fish, including tuna and shark. Seamounts (underwater mountains that do not break the surface) create local upwelling that brings nutrients into the surface and support rich local ecosystems, which in turn provide important feeding grounds for pelagic fishes and whales.

4.5 Species diversity and endemism

Although overall terrestrial species richness in Wallacea is not as high as the forests of Sundaland, Wallacea is exceptionally rich in unique species, many of them endemic to single islands or groups of islands. The drivers of speciation include isolation, periodic connection to the Australian and New Guinea land masses, and the complex patterns of tectonic movement and volcanic activity, splitting and re-forming islands. Transport by humans may also have played a role in distributing some species through the archipelago (e.g., southern cassowary (*Casuarius casuarius*) on Seram island) and has certainly had a major role in the introduction of feral and invasive species in recent millennia. The high level of endemism is at not only the species level but also at the subspecies level. One consequence of the large number of unique species dependent on small areas of habitat is such species are threatened by extinction. Wallacea is home to 728 globally threatened species (Table 7), 37 percent of all of the threatened species recorded from Indonesia, in an area that comprises only one-fifth of the land surface of the country.

The following section briefly reviews the status each main taxonomic group. Details on globally threatened species are provided in Chapter 5.

Mammals: There are 222 species of terrestrial mammal in the Wallacea Hotspot, including rodent and bat species; 127 of them (57 percent) are endemic. These include charismatic large mammals found in Sulawesi, such as three species of babirusa (*Babyrousa* spp.), lowland anoa (*Bubalus depressicorni*) and mountain anoa (*B. quarlesi*). Sulawesi island and its satellites are home to nine species of tarsier (*Tarsius* spp.) and seven species of macaque (*Macaca* spp.).

The marine mammal fauna of the region includes Important populations of sperm whale (*Physeter macrocephalus*) and blue whale (*Balaenoptera musculus*), which breed in the region. There are also important populations of dugong, especially in the Lesser Sundas.

Birds: There are 711 bird species recorded in the Wallacea Hotspot, of which 274 (39 percent) are endemic. The include one member of the bird-of-paradise family, Wallace's standardwing (*Semioptera wallacii*), which is endemic to the Halmahera island group, the unique maleo (*Macrocephalon maleo*) and a large number of parrot species. While birds are better known than most other groups, new species continue to be described from Wallacea, such as the five new species described from Peleng and Banggai by Rheindt *et al*. (2020).

Reptiles: Two hundred and twenty-two species of reptiles are found in the Wallacea Hotspot, with 99 of them (44 percent) endemic. Among the terrestrial species, Komodo dragon is the best-known and is found only in the Lesser Sundas islands of Komodo, Rinca

and Flores. The most threatened reptile is probably Roti island snake-necked turtle (*Chelodina mccordi*), which was originally known from only three sites (two KBAs) on Rote, Lake Naluk, Lake Enduy and Lake Peto, but has now been found at Lake Iralalaro at the eastern end of Timor-Leste.

There are seven sea turtle species in the world, five of them recorded in the Wallacea Hotspot: green; hawksbill (*Eretmochelys imbricata*); loggerhead (*Caretta caretta*); leatherback (*Dermochelys coriacea*); and the olive ridley (*Lepidochelys olivacea*).

Amphibians: There are 48 species of amphibians found in Wallacea, 33 (65 percent) of which are endemic. Many of the most threatened species are confined to single river basins or mountains. Many more frog species await discovery or further study (D. Iskandar pers. Comm 2013).

Fishes: More than 250 freshwater fish species occur in the Wallacea Hotspot, of which more than 50 (20 percent) are endemic. The island of Sulawesi is host to many freshwater fish species that are found only in lakes within the island, including all of the 37 globally threatened fish species within the Wallacea region.

Indonesia has 2,112 marine fish species (Huffard *et al.* 2012), and a high proportion of them are expected to occur within Wallacea. There are 110 endemic marine fish species within Wallacea (Allen and Adrim 2003, Allen and Erdmann pers. comm. 2013). A new endemic species was recently described from Timor-Leste.

Vascular plants: It is estimated that there are 10,000 plants in the Wallacea region. More than 15 percent of the species are endemic.

Insects: Lepidoptera (butterflies and moths) and Odonata (dragonfly) species are among the more well-known invertebrate fauna, while other invertebrate species groups are still poorly known in the Wallacea region. More than 40 birdwing butterflies are endemic to the region.

The number of freshwater and marine decapods is unknown but undoubtedly large. The Malili and Poso lakes and the karst ecosystem Maros-Pangkep in Sulawesi are particularly rich in endemic species, many of the threatened.

There may be as many as 450 species of coral in Wallacea. Information on the distribution is patchy, and many species are difficult to identify without microscopic examination. The data that is available suggests that most are widespread throughout the hotspot.

Sea cucumbers are threatened by overharvesting to supply the large Asian food market for beche-de-mer. *Holothuris nobilis* is at the eastern edge of its range in Wallacea, while the other species are widespread in the Indian and Pacific oceans.

Table 7: Summary of species diversity and endemism in Wallacea for groups where data are available

Taxonomic Group	Total number of species in Wallacea	Number of species endemic to the hotspot	Percent of species endemic to the hotspot	Number of threatened species in the hotspot	Percent of threatened species in the hotspot
Plants	10,000	>1,500	15	133	1
Terrestrial mammals	222	127	57	75	34
Birds	711	274	39	84	12
Reptiles	222	99	44	15	7
Amphibians	48	33	68	13	27
Freshwater fishes	250	50	20	29	12
Marine fishes	2,112*	110	+-5	79	4
Birdwing butterflies	80	40	50	18	23
Coral	450	1+	>0	178	40

Sources: CI (2010); Burung Indonesia (2013), IUCN (2021).
*figure for Indonesia, the Wallacea total is assumed to be close to this

5. CONSERVATION OUTCOMES DEFINED FOR THE HOTSPOT

The islands and seas of the Wallacea Hotspot directly and indirectly support the livelihoods of over 33 million people, as well as supplying raw materials for supply chains, which are global in scope. As a result of human activity, huge changes have already taken place in the region's ecosystems and in the numbers and distribution of species. These changes will continue and, in some cases, accelerate, as human populations grow and patterns of production and consumption change. These changes mean loss of habitat and increased pressure from harvesting and hunting, resulting in smaller, more fragmented and more vulnerable populations of many species.

Even with unlimited resources, it would be impossible to maintain all the species and ecosystems in Wallacea in their present state. In reality, funding for conservation is highly limited, and so choices need to be made about which sites, landscapes and species are the most important, feasible or urgent to conserve. CEPF invests effort in defining conservation outcomes: the quantifiable set of species, sites and corridors that must be conserved to maximize the long-term persistence of global biodiversity. By presenting quantitative and justifiable targets against which the success of investments can be measured, conservation outcomes allow the limited resources available for conservation to be targeted more effectively and their impacts to be monitored at the global scale.

Conservation outcomes form the basis for identifying biological priorities for CEPF investment in Wallacea. With the time and funding available for a grants program, CEPF cannot address more than a small proportion of these priorities, so there is a second process to select those outcomes that are the highest priorities to support through grant-making, which is the subject of Chapter 13.

5.1 Methodology

Conservation outcomes are the conservation targets in a hotspot that need to be achieved in order to prevent species extinctions and biodiversity loss. Species-level outcomes are defined in terms of species that are threatened with extinction globally. Action to address the threats may be focused on the species themselves, on sites where significant populations of the species occur, or, for some species, on larger landscapes or corridors used by the species. Conservation outcomes are, thus, defined at three levels: species; site; and corridor.

The first step in identifying conservation outcomes is the compilation of a list of species that are globally threatened. The global threat status of species is assessed by IUCN taxonomic specialist groups applying standard criteria on a species' population, population trends, life cycle and threats. CEPF defines conservation outcomes for species that are considered Critically Endangered, Endangered or Vulnerable by IUCN. The list of all threatened species in the hotspot is known as the species outcomes.

To update the species outcomes presented in the 2014 ecosystem profile, data were downloaded from the IUCN Red List website (www.iucnredlist.org) for Indonesia and Timor-Leste. For species already on the list for Wallacea, Red List status was confirmed and, where necessary, updated. The remaining list of globally threatened species in Indonesia was then reviewed to identify species that occur in Wallacea and had been added to the list of

threatened species since 2014. The final list used for this profile is based on data accessed from the IUCN Red List website on 19 August 2020 (marine species) and 30 April 2021 (terrestrial and freshwater species).

5.1.1 Methodology for species outcomes

Species outcomes are the complete list of globally threatened species found in the hotspot. Species that are known to be introductions and where the introduced population is not of significance for the conservation of the species were not included. Species outcomes do not include species classified by IUCN as Data Deficient.

Most of the globally threatened species in the hotspot can be effectively conserved through protection of their habitat (i.e., by achieving site and corridor outcomes). However, a subset of species will not be conserved by area-based conservation action alone, particularly species whose lifecycle includes moving over large distances, those that are targeted for consumption or trade, or those threatened by competition with invasive species or disease. These species, which may require targeted conservation action, are identified as priorities in Chapter 13.

5.1.2 Methodology for site outcomes

The biggest threat to biodiversity globally is habitat loss and degradation, and so conservation action often focuses on protecting and managing sites that still contain suitable habitat and viable populations of threatened species. Site protection can be highly efficient, because a whole ecosystem, with all its biodiversity and functions, can be conserved at the same time. As a consequence, almost every globally threatened species has a site outcome defined for it; the only ones that do not are those for which either no such site is known or no site can be defined that would make a meaningful contribution to its conservation.

Site outcomes are based on KBAs, as defined by IUCN (2016) and the KBA Standards and Appeals Committee (2019). In summary, a KBA is an area that contains:

- A significant population of a globally threatened species or ecosystem.
- A significant proportion of the population of an endemic species or an assemblage of species that are unique to a particular biome.

The criteria for the identification of KBAs have been extensively revised since the original ecosystem profile. They now cover all species and ecosystems, and are driven by the application of clear, quantitative thresholds for the presence of threatened species. Table 8 summarizes the new criteria for KBA identification.

The starting point for the identification of terrestrial KBAs in Wallacea was the set of KBAs identified in the 2014 ecosystem profile, which used data on 126 Important Bird Areas (IBAs) identified by BirdLife International and 16 Alliance for Zero Extinction sites, and then gathered locality records for globally threatened species from literature, stakeholder workshops and expert consultations.

Table 8: Criteria for identification of KBAs

Criteria	Relevant species/groups	A site may be a KBA if it regularly holds:
A1	Threatened species CR and EN	>0.5 percent global population + >5 reproductive units
A1	Threatened species VU	>1 percent global population + >10 reproductive units
A2	Threatened ecosystems CR/EN	>5 percent of the global extent of the ecosystem
A2	Threatened ecosystems VU	>10 percent of the global extent of the ecosystem
B1	All non-threatened species	>10 percent of the global population + >10 reproductive units
B2	Non-threatened restricted range species	>1 percent global population of 2 or more restricted-range species in the same taxonomic group*
B3	Geographically restricted assemblages	>0.5 percent of global population or >5 reproductive units of a number/proportion of the assemblage of species
B4	Geographically restricted ecosystem	>20 percent of global extent
C	Intact ecosystems	Site is one of <2 per ecoregion with wholly intact ecological community
D1	Aggregatory species	An aggregation representing >1 percent of global population over a season of key life-cycle stage OR is among the 10 largest aggregations known
D2	Any species	Support >10 percent global population at times of ecological stress
D3	Any species	Propagules, larvae or juveniles which maintain >10 percent of the global population produced at the site
E	Sites meeting irreplaceability criteria	Outcome of a quantitative analysis

Source: IUCN (2016).

To apply the revised criteria, the Indonesian KBAs on the 2014 list were reviewed and classified as follows:

- Green = good existing data are likely to allow the confirmation of the KBA under the revised criteria.
- Yellow = existing data suggest the site is a KBA but further data are required to confirm that it meets the revised criteria.
- Red = existing data suggest that the site should no longer be included in the KBA list; this may be because there has been a change in status of a trigger species at the site (e.g., it is no longer classified as a threatened species) or because new information has shown that the site is not as important for the species in question as was previously believed.

In the review of the IUCN Red List undertaken for this update, it was found that 180 species had been added to the list of threatened species in Wallacea since 2014 (see Section 5.2.1). Many of these newly added species will occur, and could be effectively protected, in the KBAs that have already been identified. For some species, however, their known distribution does not overlap with existing KBAs. As a result, seven new KBAs were proposed for these species, and the existing boundaries of three KBAs were extended to cover their distributions.

The identification of KBAs used only definite records of the presence of the species, and did not make assumptions about species' presence extrapolated from range maps. The justification for this approach is that identifying sites on the basis of range maps risks assuming that a species is being conserved at a site where it does not, in fact, occur.

Many published site records refer to named places (e.g., national parks and mountains) but do not provide a geolocated reference. These references were used as long as they could be attributed to a sufficiently specific area. References that named only the island, for example, were not used.

The data sources used for locality records were:

- IUCN Red List (IUCN 2013) and BirdLife International documentation, including the IBA directories for Asia (Chan *et al.* 2004), Maluku, Nusa Tenggara (Rombang *et al.* 2002), Sulawesi and Timor-Leste (Trainor *et al.* 2007).
- Published literature, in particular Whitten *et al.* (1987), Kottelat *et al.* (1993), Flannery (1995), Coates and Bishop (1997), Monk *et al*. (1997) and Koch (2012).
- Online databases, such as FishBase (www.fishbase.org), and the databases of museums and botanic gardens, including the Royal Botanic Gardens, Kew.
- Information from experts.
- Unpublished observations from fieldworkers, citizen scientists and local people knowledgeable about specific sites, who participated in the ecosystem profiling workshops held during 2013-2014 or communicated directly with the team.
- The National Biodiversity Strategy and Action Plans, and the National Ecological Gap Analysis, for Indonesia and Timor-Leste.
- *The Red Data Book of Threatened Species in Asia*, the World Bird/Biodiversity Database (www.globalconservation.info), the World Database on Protected Areas (www.wdpa.org), the World Database on KBAs (http://www.keybiodiversityareas.org/sites/search), and the Birds of the World database (https://birdsoftheworld.org/bow/home).

KBA boundaries were drawn on maps, using the boundary of apparently suitable habitat, when this could be seen on a satellite image. Where obvious ecological boundaries were not available but there was a protected area, the existing protected area boundary was used. However, where an ecological zone clearly had a different boundary from the protected area, the ecological boundary was given precedence, as KBAs are intended to contain specific conservation values and not be limited by administrative boundaries.

The review of the 2014 list of KBAs included a review of KBA boundaries. Revision of boundaries occurred where there had been changes to or new information about the distribution of habitat, or where there is new information on the distribution of threatened species in and around the site. As mentioned above, the boundaries of three KBAs (Balantak (IDN086), Mekongga (IDN101) and Leitimur (IDN207)) were extended to accommodate the range of newly added threatened species.

Following the methodology set out in Langhammer *et al.* (2007), terrestrial KBAs were assigned scores for vulnerability (Table 9), based on the global threat status of the species found at the site, and irreplaceability (Table 10), based on how many other sites are known to support the species found at the site. Where more than one globally threatened species

occurs at a KBA, each species was assigned a score, with the highest score being attributed to the KBA as a whole.

Table 9: Criteria used to assign vulnerability score to terrestrial KBAs

Species-based Vulnerability Score	Global Threat Status
Extreme	Critically Endangered
High	Endangered
Medium	Vulnerable
Low	Near Threatened and Least Concern

Source: Langhammer *et al.* (2007).

Table 10: Criteria used to assign irreplaceability score to terrestrial KBAs

Irreplaceability Score	Criteria if Population Data Are Available	Criteria if No Population Data are Available
Extreme	Sites known or inferred to hold 95 percent of the global population of a species	Sites holding a species endemic to the country/region that is not known to occur at any other site
High	Sites known or inferred to hold 10 percent but <95 percent of the global population of a species	Sites holding a species endemic to the country/region that is known to occur only at 2 to 10 sites *or* sites holding a species that globally is only known to occur at 2 to 10 sites
Medium	Sites known or inferred to hold 1 percent but <10 percent of the global population of a species	Sites holding a species endemic to the country/region that is known to occur only at 11 to 100 sites *or* sites holding a species that globally is known to occur only at 11 to 100 sites
Low	Sites known or inferred to hold <1 percent of the global population of a species	Sites holding a species endemic to the country/region that occurs at more than 100 sites *or* sites holding a species that globally is known to occur at >100 sites

Source: Langhammer *et al.* (2007).

The irreplaceability score is intended to represent how many opportunities (sites) there are to conserve a particular species. However, there is a risk that lack of locality data can lead to underestimating how many sites there are for a species and, thus, allocating it an irreplaceability score that is too high. To minimize these errors, an adjusted KBA number was assigned to each species and used to calculate the irreplaceability score based on the criteria in Table 10. The adjusted KBA number was an estimate of the number of KBAs with suitable habitat for the species that occur within its range. Actual and adjusted KBA numbers are given in Appendix 1.

For most globally threatened marine species, there are very few locality data available, because marine survey work has focused more on ecosystem monitoring. Data are especially scant for species that are difficult to identify. For example, more than half of the globally threatened marine species in Wallacea are corals, which, in some cases require laboratory examination to identify. For the minority of threatened marine species (e.g., Napoleon wrasse (*Cheilinus undulatus*) and bump-head parrotfish (*Bolbometopon muricatum*)) that are widespread and familiar to local stakeholders, a large number of sites are known but it is difficult to confirm if there is a significant population at any of them.

The 2014 ecosystem profile used locality records of 186 globally threatened marine species to identify 74 marine KBAs. However, no locality data were found for the remaining 66 globally threatened marine species listed at that time. Consultation with experts confirmed that the 74 KBAs identified were not representative of the distribution and richness of marine sites in the region, and so a list of potential additional KBAs was generated from existing marine prioritization exercises. Because these sites are not based on confirmed locality records, they are referred to as 'candidate KBAs.' A total of 66 candidate marine KBAs were identified using this method.

With the adoption of the new KBA guidelines, there is a greater emphasis on the need to demonstrate that a site supports a significant proportion of the global population of a threatened species or ecosystem (Table 8). The data supporting identification of marine KBAs were reviewed in December 2020. The available data only allowed for one site to be firmly proposed under the new criteria but some progress was made towards applying the new criteria to other sites (see Section 5.2.2).

To define KBAs, IUCN guidance states that, in the absence of population data, extent of suitable habitat (ESH) may be used as a proxy for population. The steps for the identification of a KBA using this approach are:

- Map the global occurrence of suitable habitat for a threatened species.
- Overlay the map of suitable habitat with the range map available from IUCN.
- Determine the ESH within the range of the species.
- Based on the ESH, establish thresholds for KBA identification: a site may qualify as a KBA if it contains >0.5 percent of the ESH for a CR or EN species, or >1 percent of the ESH for a VU species.
- Determine whether the area of suitable habitat available in the candidate KBAs is greater than the threshold to qualify as a KBA for that species.
- In addition, to qualifying as a KBA, there must be data to demonstrate that the site holds >5 reproductive units (= mature individuals in the case of species considered here) for CR and EN species, or >10 reproductive units for VU species.

Given the uncertainty of species data at marine KBAs noted above, it was not possible to apply the vulnerability-irreplaceability analysis described above to them. Instead, marine corridors were prioritized (see below), and marine KBAs were given a priority score based on the corridor they were located in.

5.1.3 Methodology for corridor outcomes

Corridors are large landscape units defined for the purposes of maintaining ecological and evolutionary processes that species and sites depend on. They may be identified for 'landscape species'. Landscape species are species that cannot be effectively protected within a KBA because they range widely during their life cycle or daily search for food (these are typically larger species or those dependent on food sources with seasonal and clumped distribution, such as frugivores) and/or because they occur at very low densities, such that a viable population can only be protected in an area much larger than a KBA.

Corridors can also be identified because they provide habitat connectivity between KBAs, and because they provide environmental services, such as watershed protection, that are of ecological and economic importance.

Terrestrial corridor outcomes were defined based on clusters of KBAs with similar ecological features, important for the conservation of landscape species and the delivery of ecosystem services important for human populations. Landscape species were identified by assessing globally threatened species within the hotspot based on their home range, feeding habits and body size. KBA clusters were identified based on the known ranges of landscape species, with their boundaries drawn to reflect the approximate limits of suitable habitat for the species concerned (which, for almost all species, is forest). The significance of KBA clusters in maintaining ecosystem services, such as provision of fresh water for areas of high population density and agricultural production, was also considered. In practice, there was a high degree of overlap between factors used for identifying KBA clusters, so that all the major remaining forested landscapes on each of the main islands in Wallacea were included within them.

Marine corridors were defined as large areas that contain critical species populations or ecological processes (such as spawning sites or feeding concentrations) and were identified on the basis of consultations with experts. Identification of marine corridors helped overcome some of the uncertainty associated with marine KBAs, noted above, because it allowed the definition of large areas of marine habitat where specific sites are not adequately known and individual species are mobile. The boundaries of marine corridors are approximate, typically following the limits of near-shore reefs, shallow seas divided by deep ocean trenches (e.g., the outer and inner Banda Arcs) or other marine ecosystems. The 2014 corridor analysis was reviewed in 2020, yielding several revisions.

5.1.4 Methodological limitations

As noted above, species and site outcomes are defined using the IUCN's global criteria for globally threatened species and KBAs. The IUCN Red List and the KBA Standard have the advantage of being standard, repeatable methodologies for categorizing the level of threat to a species and for identifying sites that contribute significantly to the global persistence of biodiversity. They do, however, have certain limitations:

- Because not all species have been assessed to determine their Red List status, there will be species in danger of extinction that are not included in the list of species outcomes and not be covered by the site outcomes identified based on this list.
- For those species that have been assessed as globally threatened, data on population size, threats and trends are rarely available. The possibility of errors in assigning threat status, therefore, cannot be eliminated.
- The availability of locality data is very limited for some species, so there is a risk that important sites are overlooked because distribution data are incomplete. Despite this, KBAs were identified based on locality data, because using range maps risks assuming a species is present at sites where it does not actually occur.
- The dependence on species as the basis for defining conservation outcomes means that the discovery of new species and changes in species taxonomy, particularly splitting one species into several, will affect the selection and prioritization of conservation outcomes.

None of these limitations invalidate the approach, however. Alternative approaches also have risks associated with them, including the possibility that, when conservation efforts are focused on the largest or most diverse sites, highly specialized, scarce species may be overlooked.

The following actions are priorities for improving the definition of conservation outcomes. They were identified in the 2014 ecosystem profile and remain valid:

- As noted in Section 5.1.2, existing data are inadequate to apply the revised KBA criteria. Given the lack of species-level data, it is important to test the application of ecosystem-based criteria for the identification of KBAs, as data for some ecosystems (e.g., coral reefs) are more complete and reliable than those for species.
- Implement studies, and publish existing studies, to describe new species and clarify the taxonomic status of many known species.
- Complete Red List assessments for more species in the Wallacea Hotspot, with special emphasis on: (1) those species groups that have not yet been widely assessed; and (2) Data Deficient species, especially those that apparently have limited ranges and small populations.
- Carry out field work to improve knowledge of the status and distribution of threatened species, particularly those known only from one or a few KBAs.
- Review the distribution of non-globally threatened endemic species within Wallacea.
- Identify further restricted-range species, and review how well these are covered in the existing network of KBAs.
- Develop a mechanism to locate, store and facilitate access to relevant data, and use these to periodically reevaluate the conservation outcomes.

5.2 Conservation outcomes

5.2.1 Species outcomes

Species outcomes consist of the list of globally threatened species found in the hotspot. As of 19 August 2020 (for marine species) and 30 April 2021 (terrestrial species), 728 species in Wallacea were classified as globally threatened by IUCN (i.e., Critically Endangered, Endangered or Vulnerable). Of these species, 448 are terrestrial or freshwater and 280 are marine. Three globally threatened species are excluded from these figures and from further analysis: Javan deer (*Rusa timorensis*), which has been introduced widely throughout the hotspot; waterwheel plant (*Aldrovanda vesiculosa*), which is extinct in Timor-Leste and has not been recorded elsewhere in Wallacea; and Chinese pond turtle (*Mauremys reevesii*), which has been introduced from East Asia at a few locations in Timor and Timor-Leste.

There was a 30 percent increase in the number of threatened species in Wallacea between 2014 and 2021, from 560 to 728 threatened species. This is a net increase, reflecting the balance of species added to and removed from the threatened species list. Most of the increase occurred among terrestrial and freshwater species, with a 45 percent increase in this group, compared to only a 10 percent increase for marine species.

Almost all of the increase in the number of threatened species has occurred because species that had not been assessed by IUCN in 2014 have since been assessed and found to be threatened. This applies to 170 species. In seven other cases, species that were classified as not threatened (i.e., Near Threatened, Least Concern or Data Deficient) in 2014 have been reassessed and found to be threatened. Conversely, there are 38 species that were classified as threatened in 2014 but that are now considered not threatened.

There have also been some changes in the level of threat to species that were already assessed as threatened in 2014. Overall, 33 species are now assessed as more threatened

than they were in 2014, nine are now assessed as less threatened and 229 remain in the same threat category. Table 11 gives further details on the changes, while Table 12 gives the current breakdown of threatened species in Wallacea according to IUCN categories. The complete list of species outcomes in Wallacea is presented in Appendix 1.

Table 11: Changes in the number of terrestrial and freshwater threatened species in Wallacea between 2014 and 2021

Type of change	Number of species affected	Notes
Species added to the Red List or moving from non-threatened to threatened categories		
Species not assessed by IUCN in 2014 but assessed as globally threatened in 2021	170	20 bird and 15 mammal species were added to the threatened species list, many the result of new species being recognized after taxonomic review. 74 plant species, 36 freshwater gastropods and 12 freshwater fish were added, as a result of new work assessing the taxonomy and status of species.
Species assessed as not threatened (i.e., Least Concern, Near Threatened or Data Deficient) in 2014 but as globally threatened in 2021	7	Three bird, two freshwater fish and two mammal species were moved from not threatened to threatened categories, following re-assessment of their status by IUCN. They include the widespread long-tailed macaque (*Macaca fascicularis*), which is now Endangered.
Species assessed as globally threatened in 2014 but as not threatened in 2021	39	22 of the species that moved from threatened to not threatened are freshwater fishes, as a result of an extensive reassessment of their threat status. Other species in this category comprise an amphibian, a bird, a butterfly, five mammals and nine plants.
Changes within the globally threatened categories		
Species that have become more threatened between 2014 and 2021	33	15 freshwater decapods, seven freshwater fishes, six birds, two plants, one mammal and one reptile have moved to higher threat categories, as re-assessment has found that their conservation status is worse than before.
Species that have become less threatened between 2014 and 2021	9	Three birds, two mammals, two freshwater fishes, one amphibian and one plant have moved to lower threat categories, as re-assessment has found that their conservation status has improved.
Species that remained in the same threat category	229	

Table 12: Total number of globally threatened species by taxonomic group and threat category, 2021

Taxonomic Group	2014 Red List	2021 Red List			
		CR	EN	VU	Total
Terrestrial mammals	64	4	31	40	75
Birds	62	15	31	38	84
Terrestrial/freshwater reptiles	10	2	4	4	10
Amphibians	8	1	4	8	13
Freshwater fishes	37	9	13	7	29
Calanoids	1	0	0	1	1
Freshwater decapods	32	14	7	14	35
Freshwater mollusks	3	26	12	1	39
Butterflies and moths	19	0	4	14	18
Dragonflies and damselflies	7	2	1	6	9
Ants, bees and wasps	0	0	0	1	1
Fungi	0	0	1	0	1
Vascular plants	68	24	46	63	133
Marine mammals	5	0	2	3	5
Marine reptiles	5	1	1	3	5
Marine fishes	54	10	18	51	79
Marine mollusks	2	0	0	2	2
Sea cucumbers	10	0	4	5	9
Marine decapods	0	0	1	1	2
Corals	176	1	10	167	178
Total	**562**	**109**	**190**	**429**	**728**

Sixty-nine percent of all terrestrial and freshwater threatened species in Wallacea are recorded from Sulawesi, with about 18 percent each in Maluku and the Lesser Sundas. When split on the basis of countries, 445 threatened species (99 percent) of terrestrial threatened species are found in Indonesian Wallacea, 17 species (4 percent) in Timor-Leste. Tables 13 and 14 summarize the distribution of terrestrial and freshwater threatened species between bioregions and countries.

Table 13: Distribution of terrestrial and freshwater threatened species by bioregion in Wallacea

Bioregion	CR	EN	VU	Total
Sulawesi	78	109	121	308
Maluku	12	23	44	79
Lesser Sundas (including Timor-Leste)	9	32	40	81
Wallacea (whole hotspot)	**97**	**155**	**196**	**448**

Notes: no bioregion is known for 1 EN species, the fungus *Calostoma insigne*; the combined totals for the bioregions are greater than the overall figure for Wallacea because some species occur in more than one bioregion.

Table 14: Distribution of terrestrial and freshwater threatened species by country in Wallacea

Country	CR	EN	VU	Total
Indonesia	96	153	196	445
Timor-Leste	3	11	3	17
Wallacea (whole hotspot)	**97**	**155**	**196**	**448**

Notes: the fungus *Calostoma insigne* (EN) is assumed to occur in Indonesian Wallacea but no site has been identified for it; the combined totals of the countries are greater than the overall figure for Wallacea because some species occur in both countries.

Critically Endangered species are considered to be in imminent danger of extinction in the wild, and so are of particular concern for conservation efforts. One hundred and nine species in Wallacea are Critically Endangered: around 1.3 percent of all Critically Endangered species worldwide. Only 12 of them are marine species: 10 fishes; one coral; and one sea turtle. The remaining 97 are terrestrial and freshwater species, of which 90 are endemic to the hotspot, and 65 are known from only one site. By far the greatest number (80 percent) of terrestrial and freshwater Critically Endangered species are recorded from Sulawesi, with around 10 percent each in Maluku and the Lesser Sundas.

The following sections summarizes the species outcomes by taxonomic group.

Terrestrial mammals. There are 222 terrestrial mammals in Wallacea, 75 (34 percent) of them are globally threatened, an increase from 64 in 2014. The changes are as follows:

- 16 species have been added to the list of threatened species: six bats; one primate; three rodents; and six tarsiers.
- Five species have been re-assessed and removed from the red list.

Four mammals are Critically Endangered. Sunda pangolin (*Manis javanica*) is widespread in Southeast Asia but under extreme pressure from the wildlife trade. The other three species are endemic to single islands in Wallacea: Talaud bear cuscus (*Ailurops melanotis*); Celebes crested macaque (*Macaca nigra*) (northern tip of Sulawesi only); and Siau island tarsier (*Tarsius tumpara*).

Birds. Of 711 bird species in Wallacea, 84 (12 percent) are classified as globally threatened. Of these, 65 are found only in Wallacea, with nine only known from one location. The total number of globally threatened bird species in Wallacea increased from 62 in 2014 to 84 in 2021. The changes are as follows:

- Three species have been added to the globally threatened list because of evidence of population decline as a result of trapping for the cage-bird trade: pale-bellied myna (*Acridotheres cinereus*); chestnut-capped thrush (*Geokichla interpres*); and Tenggara hill myna (*Gracula venerata*).
- Two endemic species have been added to the globally threatened list because they are limited to a single island, with a declining population: least boobook (*Ninox sumbaensis*); and Tanimbar scrubfowl (*Megapodius tenimberensis*).
- Fourteen species have been added to the globally threatened list because they have recently been recognized as full species, following taxonomic revisions, and have a limited range and small population: plain-backed Kingfisher (*Actenoides regalis*);

Sangihe dwarf-kingfisher (*Ceyx sangirensis*); Sumba eclectus (*Eclectus cornelia*); Tanimbar eclectus (*E. riedeli*); Sangihe pitta (*Erythropitta caeruleitorques*); Talaud pitta (*E. inspeculata*); Siau pitta (*E. palliceps*); southern hylocitrea (*Hylocitrea bonthaina*); Sangihe golden bulbul (*Hypsipetes platenae*); Bacan myzomela (*Myzomela batjanensis*); Banggai scops-owl (*Otus mendeni*); Lompobattang fruit-dove (*Ramphiculus meridionalis*); Banggai fruit-dove (*R. subgularis*); and scarlet-breasted lorikeet (*Trichoglossus forsteni*)

- Five seabirds that have been recorded in the region have also been added to the globally threatened list because they are suffering population declines on their breeding grounds: Matsudaira's storm-petrel (*Hydrobates matsudairae*); Aleutian tern (*Onychoprion aleuticus*); Beck's Petrel (*Pseudobulweria becki*); Hawaiian petrel (*Pterodroma sandwichensis*); and Heinroth's Shearwater (*Puffinus heinrothi*).
- In addition, six species have been changed from Vulnerable to Endangered, and three from Endangered to Vulnerable.
- One species, Timor imperial pigeon (*Ducula cineracea*) is no longer listed as globally threatened, but is now Near Threatened and, therefore, no longer included in the list of species outcomes for Wallacea.

Fifteen birds are Critically Endangered. Beck's petrel is a vagrant to the region, while Chinese crested-tern (*Thalasseus bernsteini*) and Christmas Island frigatebird (*Fregata andrewsi*) breed outside the region but have been recorded in Wallacea outside the breeding season. Grey-rumped myna (*Acridotheres tertius*) may occur in Wallacea but is most recently recorded from just outside the region, on Bali. Flores hawk eagle (*Nisaetus floris*) and yellow-crested cockatoo (*Cacatua sulphurea*) are endemic to Wallacea and known from a large number of sites but are under pressure across their range. Five of the Critically Endangered birds are endemic to the forests of the small island of Sangihe, northern Sulawesi, while four others are each endemic to a single island.

Terrestrial/freshwater reptiles. Of 222 terrestrial and freshwater reptiles in Wallacea, 10 (15 percent) are classified as globally threatened. Two are Critically Endangered: Roti island snake-necked turtle; which is known from only a few lakes on the Indonesian island of Rote and from Lake Iralalaro in Timor Leste; and Sulawesi forest turtle (*Leucocephalon yuwonoi*), which is endemic to northern Sulawesi, and suffered a rapid population decline as a result of collecting for the pet trade. Other threatened reptiles include: Banda island dtella (*Gehyra barea*), an Endangered gecko endemic to the Banda islands; Komodo dragon; Forsten's tortoise (*Indotestudo forstenii*); and Flores blind snake (*Indotyphlops schmutzi*). Two snakes and two turtles are more widespread in Southeast Asia but are considered threatened because of pressure from hunting and habitat loss across their range. There were no additions or deletion to the reptiles list between 2014 and 2021.

Amphibians. Of 48 amphibians in Wallacea, 13 (27 percent) are classified as globally threatened. One, the frog *Occidozyga tompotika*, is Critically Endangered, because it is known from a single location in Tompotika, Sulawesi Tengah, where it is threatened by habitat loss caused by mining, oil palm plantations and smallholder agriculture.

The total number of globally threatened amphibians in Wallacea has increased from eight in 2014 to 13 in 2021. The changes are:

- Six frogs have been added because they are now assessed as threatened*:* *Chalcorana macrops* (VU); *Occidozyga floresiana* (VU); *O. tompotika* (CR);

Oreophryne rookmaakeri (EN); *O. zimmeri* (EN) and *Rhacophorus monticola* (VU). All are endemic to Wallacea and known from only a few locations.

- Kopstein's callulop frog (*Callulops kopsteini*) has been changed from Endangered to Data Deficient. The species is only known from a single specimen, from the island of Sanana in Maluku. Nothing is known about its ecology, population or threats.
- Djikoro wart frog (*Limnonectes arathooni*) has been re-assessed and moved from Endangered to Vulnerable category.

Freshwater fishes. Wallacea has 250 species of freshwater fish, with 29 (12 percent) of them classified as globally threatened: a decrease from 37 in 2014. The changes are the result of extensive survey work in Sulawesi, especially in the Lake Poso-Malili Lakes area:

- Thirteen species that were not included in the 2014 analysis have now been assessed as globally threatened. Two of them are Critically Endangered, presumed extinct: *Oryzias timorensis*, which is known from a stream system in central Timor island and has not been seen since it was discovered in 1911; and *Adrianichthys roseni*, which has not been seen since it was discovered in Lake Poso, Sulawesi Tengah, in 1978. *O. soerotoi*, known only from Danau Tiu, a small lake in Sulawesi Tengah, is also Critically Endangered. Three of the species added to the red list are from the Malili lakes complex in Sulawesi Tengah: *Glossogobius mahalonensis*; *O. hadiatyae* and *Telmatherina bonti*. The other seven are from single lakes or restricted areas of river systems elsewhere in Sulawesi Tengah, Sulawesi Selatan and Sulawesi Tenggara. One species is endemic to the river flowing out of Lake Iralalaro in Timor-Leste.
- Eight species which were already included on the red list are now in a higher threat category. Duck-billed bunting (*Adrianichthys kruyti*) has changed from Critically Endangered to Critically Endangered, possibly extinct, as it has not been seen in Lake Poso since 1983, despite surveys being carried out. Three other fishes have moved to the Critically Endangered category: *Paratherina labiosa*, which is endemic to a single small lake in the Malili lakes system; *Tondanichthys kottelati*, which is known only from a single location in Lake Tondano, Sulawesi Utara; and Sarasin's minnow (*Xenopoecilus sarasinorum*), which is endemic to Lake Lindu in Sulawesi Tengah and appears to have suffered a dramatic population decline between 2011 and 2017.
- Two species have been re-assessed and moved to lower threat categories: *Nomorhamphus towoetii*, which lives in Towuti and Poso lakes in Sulawesi Tengah; and Popta's buntingi (*Xenopoecilus poptae*), endemic to Lake Poso, which moved from Critically Endangered to Endangered.
- 22 species that were included in the 2014 ecosystem profile have now been moved to the Near Threatened category. Eighteen of them are endemic to the Malili Lakes complex in Sulawesi Tengah, and moved to a less threatened category because they were found to be relatively abundant and/or widespread in recent surveys. A further three are endemic to neighboring Lake Poso, and were also found to be relatively common in recent surveys. One, *Oryzias celebensis*, is known from several localities and has a large population in Sulawesi Tengah, Sulawesi Selatan and Sulawesi Tenggara.

Freshwater decapods (crabs and shrimps). There are now 35 species of globally threatened freshwater decapod in Wallacea, three more than in 2014. Many of the species on the existing list have been re-assessed and had their status changed to a more threatened category.

The changes are as follows:

- Three species are newly assessed as globally threatened: gold-leg Matano crab (*Parathelphusa ferruginea*); Towuti molluscivore crab (*Syntripsa flavichela*); and Matano molluscivore crab (*S. matannensis*). All three are endemic to the Towuti-Matano lakes complex in Sulawesi Tengah, and are classified as Endangered.
- Thirteen species of freshwater shrimp have been changed from Endangered to Critically Endangered.
- The status of two species of freshwater crab has been changed from Vulnerable to Endangered. Both are endemic to the same lakes complex.

Fourteen Decapods are classified as Critically Endangered, all of them shrimps from the genus *Caridina* and all endemic to lakes in Sulawesi Tengah. One, *Caridina linduensis*, is unique to Lindu Lake, Lore Lindu, while the other 13 are known from the Malili lakes complex: Lake Mahalona; Lake Towuti; and Lake Matano. One of them, cardinal shrimp (*Caridina dennerli*), is possibly extinct. These lakes are also extremely important for threatened freshwater mollusks (see below).

Freshwater calanoids. One species of freshwater copepod, *Neodiaptomus lymphatus*, is listed as globally threatened. There has been no change between 2014 and 2021.

Freshwater mollusks. The number of globally threatened species in this group has increased dramatically, from three in 2014 to 39 in 2021, as a result of taxonomic and ecological work on the freshwater snail fauna of the Malili lakes complex in Sulawesi Tengah. The changes are:

- Three species have been classified as a Critically Endangered, possibly extinct: *Sulawesidrobia datar*; *S. yunusi*; and *Tylomelania zeamais*. They are all endemic to Lake Matano, in the Malili Lakes system, where they were last seen some years ago and were not found in recent (2017-2018) surveys.
- A further 22 species have been added to the Red List as Critically Endangered. All are endemic to small areas (in many cases a single site) in the Malili Lakes system, where they are expected to be threatened by the spread of invasive predatory cichlid fish, as well as pollution and other pressures.
- The remaining 11 additional species are classified as Endangered. All are endemic to the Malili lakes system but are more widespread or abundant than the species classified as Critically Endangered.

Butterflies and moths. There are 18 globally threatened butterfly species in Wallacea, all but one endemic to the hotspot. Nine are endemic to Sulawesi and its islands, three to Maluku and five to the Lesser Sundas. One species, Wallace's golden birdwing (*Ornithoptera croesus*) has been re-assessed since 2014, and changed from Endangered to Near Threatened. There have been no other changes to the list.

Dragonflies and damselflies. Nine species of dragonfly and damselfly from Wallacea are on the Red List as globally threatened. All are endemic to Wallacea, with four of them known from only one site. Two are Critically Endangered: *Protosticta gracilis*, which is known from near Tondano Lake in Sulawesi Utara, where it was last recorded in 1859 and may now be extinct; and *P. rozendalorum*, which is endemic to the island of Sangihe and known from a few specimens collected in 1985. Since 2014, there have been two additions

to the list of globally threatened species: *Drepanosticta hamulifera*, known only from the small island of Kabaena (Sulawesi) from the type specimen collected in 1989; and *Oligoaeschna venatrix*, known from a small number of widely scattered sites in Sulawesi.

Ant, bees and wasps. One bee species from Wallacea is assessed as globally threatened: Wallace's giant bee (*Megachile pluto*). The species is little known, rare and may be restricted to primary forests in Maluku Utara. It is classified as Vulnerable. The species was not included in the 2014 ecosystem profile.

Fungi. A single species of fungi was added to the red list for Wallacea after assessment in 2019. The species, *Calostoma insigne*, is widespread in Southeast Asia and Papua New Guinea but has a disjunct distribution and is suspected to have suffered habitat loss and thus a severe population decline. The fungus forms symbiotic relations with rainforest trees of the dipterocarp family, and the calculation of habitat loss and projected population decline is based on the decline of forest cover across the species's range. No confirmed sites for the species have been identified in Wallacea.

Vascular plants. Wallacea has an estimated 10,000 plant species, with more than 1,500 of them endemic to the hotspot and 133 (1 percent) on the red list. Twenty-four of them are Critically Endangered, including the orchid *Dendrobium bandaense*, which is only know from the type specimen, collected in 1901 on an island in the Banda archipelago. The species is, therefore, classified as Critically Endangered, possibly extinct. Of the other 23 Critically Endangered species: six are forest trees known from single localities in Seram, Ambon, Sulawesi, Sumbawa and Timor-Leste; five are orchids known from very small areas in Ternate, Sulawesi and Bacan; and eight are members of the ginger family Zingiberaceae, each known from a single site across Sulawesi. A further four Critically Endangered species are forest trees from the dipterocarp family, three of them endemic to the region but relatively widely distributed.

The list of globally threatened vascular plants has increased from 68 in 2014 to 133 in 2021. The changes are as follows:

- Seventy-three globally threatened species have been added, the majority through the assessment of species that were not previously covered. These include: 22 species of tree from the Lauraceae family, each known from one or only a handful of localities; 10 other tree species, including the eucalypt *Lauralee urophylla;* six *Dendrobium* orchids; six slipper orchids (*Paphiopedilum* spp.); 23 plants of the genus *Etlingera*; a ginger, *Zingiber* sp.; a pitcher plant, *Nepenthes pitopangii*; and a bamboo *Chloothamnus reholttumianus*.
- Eight species have been re-assessed and removed from the Red List. These include four species of trees (ramin (*Gonystylus macrophyllus*), Moluccan ironwood (*Intsia bijuga*), *Mangifera altissima* and *M. timorensis*), as well as four species of pitcher plant (*Nepenthes* spp.).

Two globally threatened plant species are associated with coastal and marine habitats: the mangrove trees *Camptostemon philippinense* (Endangered) and *Avicennia rumphiana* (Vulnerable). Both were included in the 2014 ecosystem profile.

Marine mammals. Five marine mammals are globally threatened: four whales; and dugong. The list of threatened marine mammals remained the same from 2014 to 2020, but

the status of fin whale (*Balaenoptera physalus*) changed from Endangered to Vulnerable, as a result of increasing population and threats being brought under control.

Marine reptiles. All five of the sea turtles recorded in Wallacea are globally threatened. One, hawksbill sea turtle, is classified as Critically Endangered. Green sea turtle is Endangered, while loggerhead sea turtle, leatherback sea turtle and olive ridley sea turtle are Vulnerable. The list of globally threatened marine reptiles remained the same between 2014 and 2020 but the status of loggerhead sea turtle *Caretta caretta* has been re-assessed from Endangered to Vulnerable.

Marine fishes. Of the estimated 2,112 marine fish species in Wallacea, 79 are classified as globally threatened. Ten are Critically Endangered, including seven shark species, two sawfish and southern bluefin tuna (*Thunnus maccoyii*). A further 18 are Endangered, including five rays and nine sharks. The remaining 51 species, including 13 rays, 12 sharks and eight seahorse species, are classified as Vulnerable. Two blenny species, two goby species and Indonesian coelacanth (*Latimeria menadoensis*) are endemic to Wallacea; all are all Vulnerable.

The list of globally threatened marine fish in Wallacea increased from 54 in 2014 to 79 in 2020. This is a result of the following changes:

- Three species have been removed from the list after a review of their range, as there are no confirmed records in Wallacea: common thresher shark (*Alopias vulpinus*); golden threadfin bream (*Nemipterus virgatus*); and dwarf sawfish (*Pristis clavata*).
- Three species have been removed from the list after they were downlisted from globally threatened categories: black-saddled coral grouper (*Plectropomus laevis*), which is now assessed as Least Concern; barramundi cod (*Cromileptes altivelis*), which is now assessed as Data Deficient; and giant grouper (*Epinephelus lanceolatus*), which is also now Data Deficient.
- Thirty-one species were added to the list because they were assessed as globally threatened since 2014. These include: 10 ray and seven shark species, added because of intense exploitation and slow recovery of populations (and in one case because of a taxonomic change); five fish that are dependent on *Acropora* corals, and so are impacted by the decline of these corals across the region; three species endemic to Wallacea and known from only a few localities; two species that form spawning aggregations that are targeted by fishers; and others that are vulnerable to over-fishing and by-catch, including ocean sunfish (*Mola mola*).

Marine mollusks. Two marine bivalves are classified as globally threatened: giant clam (*Tridacna gigas*); and southern giant clam (*T. derasa*). Both of them are classified as Vulnerable. Further data and information of these species is needed for updating their status. There has been no change since the 2014 ecosystem profile.

Marine decapods. Two crabs, tri-spine horseshoe crab (*Tachypleus tridentatus*) and coconut crab (*Birgus latro*), are classified as Vulnerable. These species were not on the 2014 list of species outcomes for Wallacea as they were previously listed as Data Deficient; they were re-assessed as Vulnerable in 2020.

Sea cucumbers. Sea cucumbers are threatened by overharvesting to supply the large Asian food market for *bêche-de-mer*. Nine species in Wallacea are globally threatened: four

are Endangered; and five are Vulnerable. The Endangered sea cucumber, *Holothuria nobilis*, was included on the list of species outcomes in the previous ecosystem profile but, after review, it has been removed, as its range does not include Wallacea.

Corals. Of around 450 hard coral species in Wallacea, 178 are classified as globally threatened, most on the basis of their sensitivity to temperature change and susceptibility to bleaching (Carpenter *et al*. 2008). One, *Millepora boschmai*, is Critically Endangered, because it is only known from a few locations in Indonesia and Panama. Ten corals are classified as Endangered, including one species endemic to Wallacea, *Acropora suharsonoi*, which occurs in the waters around Lombok, Sumbawa and Sumba. One hundred and sixty-seven corals are classified as Vulnerable. Information on their distribution is patchy, and many species are difficult to identify without microscopic examination.

The total number of globally threatened corals on the species outcome list for Wallacea has increased from 176 in 2014 to 178 in 2020. The changes are:

- *Lobophyllia flabelliformis* (Vulnerable), *Acropora suharsonoi* (Endangered, endemic to Wallacea) and *Alveopora minuta* (Endangered, endemic to the Coral Triangle) have been added to the list. All three were originally assessed as globally threatened in 2008 and appear to have been omitted from the 2014 ecosystem profile in error.
- The coral *Favia rosaria* has been deleted from the species outcome list, as a review of its range confirmed that it is not found in the hotspot.

Lack of data on the range of globally threatened species was a major constraint in the identification and prioritization of KBAs. For 16 terrestrial globally threatened species, no data were found to support the identification of site outcomes in Wallacea (Table 15). It is likely that most of these species already occur in existing KBAs but field work is needed to confirm this and, thus, ensure that the conservation of these species is addressed.

Table 15: Terrestrial globally threatened species in Wallacea for which no KBAs could be identified

Group	Scientific name	English name	Red List status	Wallacea endemic	Distribution	Action needed
Butterflies and moths	*Parantica philo*	Sumbawa tiger	VU	Yes	Sumbawa (Nusa Tenggara Barat)	Surveys to locate sites for the species
Butterflies and moths	*Parantica timorica*	Timor yellow tiger	EN	Yes	Timor (Nusa Tenggara Timur) and Timor-Leste	Surveys to locate sites for the species
Freshwater fishes	*Pandaka pygmaea*	Dwarf pygmy goby	CR	No	Sulawesi (also Indonesia, Philippines, Fiji, New Guinea)	Clarification of distribution and reassessment of threat status
Mammals	*Acerodon celebensis*	Sulawesi fruit bat	VU	Yes	Soppeng (Sulawesi Selatan)	Surveys to locate sites for the species

Group	Scientific name	English name	Red List status	Wallacea endemic	Distribution	Action needed
Mammals	*Rhinolophus canuti*	Canoet's horseshoe bat	VU	No	Timor (Nusa Tenggara Timur) and Timor-Leste	Single record from Timor may be a distinct form; requires further survey and clarification of taxonomy
Mammals	*Rhinolophus montanus*	Timorese horseshoe bat	EN	Yes	Known from four sites in Timor-Leste	Confirm presence in existing KBAs, confirm status
Mammals	*Pteropus conspicillatus*	Spectacled flying-fox	EN	No	Maluku Utara, coastal New Guinea and NE Australia	Confirm presence in existing KBAs, confirm status
Birds	*Pterodroma sandwichensis*	Hawaiian petrel	EN	No	Banda Neira (Maluku)	Further records to establish status in Wallacea
Birds	*Puffinus heinrothi*	Heinroth's shearwater	VU	No	Taliabu (Maluku Utara)	Further records to establish status in Wallacea
Birds	*Pseudobulweria becki*	Beck's petrel	CR	No	Halmahera (Maluku Utara)	Further records to establish status in Wallacea
Birds	*Hydrobates matsudairae*	Matsudaira's storm-petrel	VU	No	Lombok Strait (Nusa Tenggara Barat) and Timor-Leste	Further records to establish status in Wallacea
Birds	*Onychoprion aleuticus*	Aleutian tern	VU	No	Muara Bone (Gorontalo)	Further records to establish status in Wallacea
Plants	*Erythrina euodiphylla*		VU	No	Timor (Nusa Tenggara Timur) and Timor-Leste	Persistence of the species on Timor (single record in 1968) needs to be confirmed
Plants	*Aglaia speciosa*		VU	No	Sulawesi (also throughout Borneo and Sumatra)	The assessment for this species is old (1998) and needs updating
Plants	*Pterospermum blumeanum*		EN	No	Lombok (Nusa Tenggara Barat; also Java, Bali, Sumatra)	Confirm sites and the status of the species in Lombok
Fungi	*Calostoma insigne*		EN	No	Throughout Wallacea (also Indonesia, PNG, Malaysia, Thailand, Philippines)	Confirm sites and the status of the species in Wallacea

5.2.2 Site Outcomes

Terrestrial and freshwater KBAs

This analysis reviewed the 251 terrestrial KBAs identified in the 2014 ecosystem profile in light of the revised list of globally threatened species (see Section 5.2.1) and new information on existing KBAs. As a result, seven new KBAs were proposed: six in Sulawesi; and one in the Lesser Sundas (Table 16).

Table 16: Proposed new KBAs

Bioregion	Proposed KBA name	Justification for KBA status
Sulawesi	Danau Tiu	Only known site for the fish, *Oryzias soerotoi* (CR), which is endemic to this 2,400-ha lake in Sulawesi Tengah.
Sulawesi	Gunung Hek	This mountain in Sulawesi Tengah holds the only known sites for two ginger species: *Etlingera serrata* (CR); and *E. hyalina* (EN).
Sulawesi	Malili	The proposed KBA complements the existing KBAs of Lakes Towuti, Mahalona and Feruhumpenai-Matano, which together make up an exceptional center of freshwater endemism, with 101 threatened species. It covers the Larona River, which drains the lakes complex, and is the only known site for the freshwater snails *Tylomelania baskasti* (CR) and *T. sinabartfeldi* (CR). It includes the surrounding catchment, which has six threatened plant species: *Cryptocarya sulavesiana* (CR); *C. microcos* (EN); *Cinnamomum sulavesianum* (EN); *Dehaasia celebica* (VU); *Lindera apoensis* (VU); and *Manilkara fasciculata* (VU).
Sulawesi	Nanggala	This site holds two slipper orchid species with wide distributions in Southeast Asia but that are declining and, therefore, classified as EN: *Paphiopedilum bullenianum*; and *P. lowii*. It is the only KBA identified for these species in Wallacea.
Sulawesi	Pulau Tagulandang	This small island in Sulawesi Utara probably holds the largest population of Siau pitta (EN), a bird species found on only three small islands in the Sangihe-Talaud island group.
Sulawesi	Tolinggula	This site holds two of only three known locations for the ginger, *Etlingera borealis* (EN), which is only found on the north coast of Gorontalo province.
Lesser Sundas	Lakaan Mandeu	The site comprises a single stream (Mota Talau) and its catchment, in the center of Timor island on the Indonesian side of the border with Timor-Leste. The stream is the only known site for the fish *Oryzias timorensis* (CR(PE)).

Taking into account these changes, a revised list of 258 terrestrial and freshwater KBAs was proposed, comprising 101 in the Sulawesi bioregion, 51 in the Maluku bioregion and 106 in the Lesser Sundas bioregion (83 in Indonesia and 23 in Timor-Leste) (Tables 17 and 18 and Appendix 2). These KBAs cover 8.7 million ha or 26 percent of the land area of the hotspot.

Table 17: Number of terrestrial and freshwater KBAs by bioregion

Bioregion	# KBAs	Area (ha)
Sulawesi	101	5,146,103
Maluku	57	1,814,660
Lesser Sundas	100	1,779,178
Total	**258**	**8,739,941**

Table 18: Number of terrestrial and freshwater KBAs by country

Country	# KBAs	Area (ha)
Indonesia	235	8,360,193
Timor-Leste	23	379,748
Total	**258**	**8,739,941**

As noted in Section 5.1.2, the criteria for identification of KBAs (IUCN 2016) were refined since the original ecosystem profile was prepared. The data available on most KBAs are inadequate to properly assess them against the new criteria. As a first step, the data available for existing KBAs in Indonesia were reviewed and they were classified "green", "yellow" or "red" (see Section 5.1.2 for further details on the method). Using this approach:

- 50 KBAs were classified as green. Relatively minor efforts to confirm the presence and population of key species is likely to allow these KBAs to be confirmed under the revised criteria
- 176 KBAs were classified as yellow. Substantial additional survey work is required to confirm that these KBAs have the conservation values for which they were identified.
- 9 KBAs were classified as red. It is likely that further work will confirm that these sites do not hold the conservation values for which they were defined. However, it is possible that they will be found to be important for other species or ecosystems.

In addition to the review of KBA data carried out by the CEPF team for Indonesia, a group of government and NGO stakeholders in Timor-Leste reviewed the KBA list for that country in the light of a protected areas decree which has now been passed. They recommended:

- 21 of 23 existing terrestrial KBAs should be confirmed, although further review of data is required to confirm that they meet the new KBA standard. The two KBAs proposed to be excluded are Laleia (TLS014) and Leimia Kraik (TLS021).
- 28 new sites that are now official protected areas should also be considered as KBAs. Available species data do not yet support their confirmation as KBAs, and so they are not included in this analysis for now. These sites are listed in Appendix 3.

Eleven of the KBAs included in this analysis are highlighted for review and possible deletion, as the evidence supporting their status as KBAs is poor. There are eight such KBAs in the Maluku bioregion and three in the Lesser Sundas (Table 19).

The terrestrial and freshwater KBAs were ranked on the basis of vulnerability and irreplaceability scores, following the methodology described in Section 5.1.2. The 11 KBAs listed in Table 19 could not be included, because they did not have associated globally threatened species data. Using this approach, 40 KBAs emerged as the top ranked because they support species that are Critically Endangered and unique to a single site. These KBAs thus scored "extreme" for both vulnerability and irreplaceability (Table 20).

Twenty-three of the top-ranked terrestrial KBAs for vulnerability and irreplaceability are in the Sulawesi bioregion. They include the four KBAs that cover the Malili lakes complex, three other isolated lakes with threatened endemic species, six mountains with endemic species on the Sulawesi mainland, and five KBAs on surrounding island groups: Sangihe; Siau; Muna-Buton; Selayar; and Sula. Seven sites are in the Lesser Sundas bioregion: two in Timor-Leste; and five on the main islands of Nusa Tenggara (Timor, Sumba, Flores and

Sumbawa). The Maluku bioregion has 10 sites, with five on Halmahera, three on Seram and one each on Banda and Buru.

Table 19: KBAs proposed for review

KBA name	Bioregion	Justification for review
Kepulauan Tayandu	Maluku	These small island KBAs were identified in the 2014 ecosystem profile on the basis of IBAs defined for non-threatened species with a limited range and for congregations of seabirds. Virtually no data have been found to evaluate whether these sites meet the KBA criteria.
Pulau Manuk	Maluku	
Pulau Obit	Maluku	
Kepulauan Lemola	Maluku	
Pulau Babar	Maluku	
Pulau Damar	Maluku	
Pulau Larat	Maluku	
Pulau Romang	Maluku	
Pulau Dana	Lesser Sundas	
Laleia	Lesser Sundas	These sites were originally identified as KBAs for two threatened species that are widespread in the region: yellow-crested cockatoo; and sandalwood (*Santalum album*). There are many other sites for both species throughout the Lesser Sundas. A review by stakeholders in Timor-Leste in 2021 concluded that there is no evidence that the sites are important for these species and recommended that they be removed from the KBA list.
Leimia Kraik	Lesser Sundas	

The top-ranked terrestrial KBAs include sites with exceptional numbers of Critically Endangered Species, including 27 at Danau Towuti, 15 at Danau Mahalona and 10 at Feruhumpenai-Matano. Other notable sites are Lore Lindu, Gunung Sahendaruman and Danau Poso, with eight, seven and six Critically Endangered species, respectively.

Table 20: Top-ranked terrestrial KBAs with at least one Critically Endangered species (species vulnerability = extreme) and one species not known from any other site (irreplaceability = extreme)

KBA #	KBA	CR and single-site species at the KBA	Red List status	Single site species
Sulawesi bioregion				
IDN086	Balantak	*Occidozyga tompotika*	CR	single site
IDN096	Danau Mahalona	*Tylomelania confusa*	CR	single site
		Tylomelania hannelorae	CR	single site
		Tylomelania inconspicua	CR	single site
		Tylomelania kruimeli	CR	single site
		Tylomelania mahalonensis	CR	single site
		Sulawesidrobia mahalonaensis	CR	single site
IDN073	Danau Poso	*Adrianichthys kruyti*	CR	single site
		Adrianichthys roseni	CR	single site
		Mugilogobius amadi	CR	single site
IDN360	Danau Tiu	*Oryzias soerotoi*	CR	single site

KBA #	KBA	CR and single-site species at the KBA	Red List status	Single site species
IDN027	Danau Tondano	*Protosticta gracilis*	CR	single site
		Tondanichthys kottelati	CR	single site
IDN097	Danau Towuti	*Tylomelania bakara*	CR	single site
		Tylomelania masapensis	CR	single site
		Sulawesidrobia abreui	CR	single site
		Sulawesidrobia anceps	CR	single site
		Sulawesidrobia bicolor	CR	single site
		Sulawesidrobia perempuan	CR	single site
		Sulawesidrobia soedjatmokoi	CR	single site
		Sulawesidrobia towutiensis	CR	single site
		Caridina glaubrechti	CR	single site
		Caridina profundicola	CR	single site
		Caridina spinata	CR	single site
		Caridina spongicola	CR	single site
		Caridina woltereckae	CR	single site
		Paratherina labiosa	CR	single site
IDN095	Feruhumpenai-Matano	*Tylomelania turriformis*	CR	single site
		Tylomelania zeamais	CR	single site
		Sulawesidrobia datar	CR	single site
		Sulawesidrobia yunusi	CR	single site
		Caridina dennerli	CR	single site
IDN035	Gunung Ambang	*Etlingera xanthantha*	CR	single site
IDN363	Gunung Hek	*Etlingera serrata*	CR	single site
IDN012	Gunung Sahendaruman	*Ceyx sangirensis*	CR	single site
		Coracornis sanghirensis	CR	single site
		Hypsipetes platenae	CR	single site
		Zosterops nehrkorni	CR	single site
IDN060	Gunung Tinombala	*Etlingera caudata*	CR	single site
IDN124	Gunung Watusangia	*Vatica flavovirens*	CR	
		Drepanosticta hamulifera	VU	single site
IDN138	Karaeng-Lompobattang	*Etlingera doliiformis*	CR	single site
IDN067	Lore Lindu	*Caridina linduensis*	CR	single site
		Xenopoecilus sarasinorum	CR	single site
		Etlingera mucida	CR	single site
IDN029	Mahawu-Masarang	*Macaca nigra*	CR	
		Parantica kuekenthali	EN	single site
		Sundathelphusa rubra	VU	single site

KBA #	KBA	CR and single-site species at the KBA	Red List status	Single site species
IDN357	Malili	*Tylomelania sinabartfeldi*	CR	single site
		Cryptocarya sulavesiana	CR	single site
		Tylomelania baskasti	CR	single site
IDN126	Mambuliling	*Endiandra chartacea*	CR	single site
IDN074	Morowali	*Paphiopedilum intaniae*	CR	single site
IDN129	Pegunungan Latimojong	*Etlingera chlorodonta*	CR	single site
IDN066	Pegunungan Tokalekaju	*Paphiopedilum gigantifolium*	CR	single site
		Etlingera urophylla	CR	single site
IDN015	Pulau Siau	*Tarsius tumpara*	CR	single site
IDN142	Pulau Tana Jampea	*Cacatua sulphurea*	CR	
		Symposiachrus everetti	EN	single site
IDN089	Taliabu Utara	*Shorea selanica*	CR	
		Tyto nigrobrunnea	VU	single site
Maluku Bioregion				
IDN165	Aketajawe	*Shorea montigena*	CR	
		Nepenthes danseri	VU	single site
IDN185	Gunung Batu Putih	*Shorea selanica*	CR	
		Ornithoptera aesacus	VU	single site
IDN192	Gunung Kepala Madang	*Troides prattorum*	VU	single site
		Charmosyna toxopei	CR	
		Shorea montigena	CR	
		Shorea selanica	CR	
IDN178	Gunung Sibela	*Paphiopedilum schoseri*	CR	single site
IDN207	Leitimur	*Actinodaphne rumphii*	CR	single site
IDN212	Manusela	*Cryptocarya ceramica*	CR	single site
IDN145	Morotai	*Madhuca boerlageana*	CR	
		Guioa malukuensis	VU	single site
IDN199	Pulau Buano	*Symposiachrus boanensis*	CR	single site
IDN226	Pulau Gunung Api	*Dendrobium bandaense*	CR	single site
IDN163	Ternate	*Dendrobium militare*	CR	single site
Lesser Sundas Bioregion (Indonesia)				
IDN362	Lakaan Mandeu	*Oryzias timorensis*	CR	single site
IDN268	Manupeu Tanadaru	*Cacatua sulphurea*	CR	
		Papilio neumoegeni	VU	single site
		Paragomphus tachyerges	VU	single site
IDN284	Mbeliling-Tanjung Kerita Mese	*Nisaetus floris*	CR	
		Cacatua sulphurea	CR	
		Knema steenisii	VU	single site

KBA #	KBA	CR and single-site species at the KBA	Red List status	Single site species
IDN241	Puncak Ngengas	*Cryptocarya sumbawaensis*	CR	single site
IDN288	Ruteng	*Nisaetus floris*	CR	
		Parantica wegneri	VU	single site
		Paulamys naso	EN	single site
		Suncus mertensi	EN	single site
Lesser Sundas Bioregion (Timor-Leste)				
TLS020	Monte Tatamailau	*Eucalyptus orophila*	CR	single site
TLS001	Nino Konis Santana	*Chelodina mccordi*	CR	
		Craterocephalus laisapi	EN	single site

Together, the 40 top-ranked sites hold 76 percent of all the globally threatened species in Wallacea, including 93 percent of all Critically Endangered species (Table 21). When broken down according to taxonomic groups, over 80 percent of the threatened amphibians, reptiles, decapods, gastropods, hymenopterans and lepidopterans are also covered by the 40 priority sites, with over 60 percent of other groups (Table 22).

Table 21: Representation of globally threatened species in the 40 top-ranked KBAs

Red List category	Total number of globally threatened species in Wallacea	Number of globally threatened species in the 40 top-ranked KBAs	Percentage coverage
Critically Endangered	97	90	93
Endangered	154	113	73
Vulnerable	197	136	69
Total	**448**	**339**	**76**

The Alliance for Zero Extinction (AZE) identifies sites that hold a Critically Endangered or Endangered single-site endemic species. In 2018, a major reassessment mapped the AZE sites that must be effectively protected if the world's most threatened species are to survive. Twenty AZE sites were identified in Wallacea, up from 16 in the original ecosystem profile. All the AZE sites are included in the list of top-ranked KBAs. The newly recognized AZE sites are Danau Poso, Danau Rana, Danau Towuti, Feruhumpenai-Matano, Kepulauan Togean and Lore Lindu. Meanwhile, two KBAs were no longer recognized as AZE sites. Labobo-Bangkurung is no longer recognized as an AZE site because Banggai Crow (*Corvus unicolor*, CR) is now known from more than one KBA. Taliabu is no longer recognized because Taliabu masked-owl (*Tyto nigrobrunnea*) has been downlisted from Endangered to Vulnerable on the IUCN Red List.

Table 22: Representation of globally threatened species in the 40 top-ranked KBAs, by taxonomic group

Taxonomic group	Total number of globally threatened species in Wallacea	Number of globally threatened species in the 40 top-ranked KBAs	Percentage coverage
Birds	84	53	63
Mammals	75	50	67
Amphibians	13	11	85
Reptiles	10	9	90
Freshwater fishes	29	22	76
Decapods	35	30	86
Mollusks	39	39	100
Ants, bees and wasps	1	1	100
Butterflies and moths	18	16	89
Dragonflies and damselflies	9	6	67
Calanoids	1	0	0
Plants	133	102	77
Fungi	1	0	0
Total	**448**	**339**	**76**

Marine KBAs

Seventy-four marine KBAs were identified in the original ecosystem profile. Data from the 2014 marine KBA analysis were reviewed with reference to the new KBA criteria (IUCN 2016). One KBA has adequate species data to justify listing the site as a global KBA under Criterion A1a (globally threatened species). The site is Perairan Peleng-Banggai (IDN081), for which population data on the endemic, Endangered Banggai cardinalfish are available from a long-term conservation effort (partly supported by CEPF during Phase I).

Given the lack of population data, marine KBA identification based on extent of suitable habitat (ESH) was attempted. In practice, application of this approach requires that the species in question is clearly associated with a specific habitat (e.g., coral reef, seagrass) for the mature phase of its lifecycle, and that the habitat can be mapped. In addition, this approach is only likely to be relevant for species with a limited global range, because, for species with a large global range, the extent of ESH will be so large that there is little chance of a single KBA containing 0.5 or 1 percent of the ESH.

Threatened species that have a limited range (Coral Triangle or smaller), and that are associated with a habitat for which spatial data exist in Wallacea (i.e., coral reefs, seagrass or mangrove), were identified. This allowed the generation of thresholds that individual sites would need to meet to qualify as a KBA. Table 23 shows an estimate of ESH and KBA threshold for four candidate KBA trigger species.

Table 23: Species for which extent of suitable habitat and ecosystem thresholds were calculated

Species name	Habitat	Red List category	Range (ha)	ESH (ha)	KBA threshold (ha)
Acropora suharsonoi	coral reef	EN	4,925,598	19,468	97
Argyrosomus japonicus	estuarine	EN	256,433,557	21,724	109
Eviota pamae	coral reef	VU	1,014,488	904,698	9,047
Gobiodon aoyagii	coral reef	VU	803,240	3,652	37

A preliminary review of existing KBAs did not reveal any sites that met the threshold for the area of habitat within the range of the species above. This analysis requires further work to verify and expand the results.

The revised KBA criteria include identification of KBAs based on the presence of threatened ecosystems (Criterion A2). The threshold for a site to quality as a KBA under this criterion is that it contains >5 percent of a Critically Endangered or Endangered ecosystem or >10 percent of a Vulnerable ecosystem. To apply this criterion requires a clear definition of an ecosystem that can be mapped, and that the ecosystem in question has been assessed and qualifies as threatened under the relevant IUCN criteria.

To clarify the issue of ecosystem definition, the profiling team consulted with the KBA team at BirdLife International, the IUCN Red List of Ecosystems team, and scientists currently working on Red Listing in the Western Indian Ocean marine regions. The conclusion was that an acceptable definition of an ecosystem for the purposes of threat assessment and KBA identification would be to use the ecosystem functional groups defined by Keith *et al.* (2020). Relevant ones for Wallacea include:

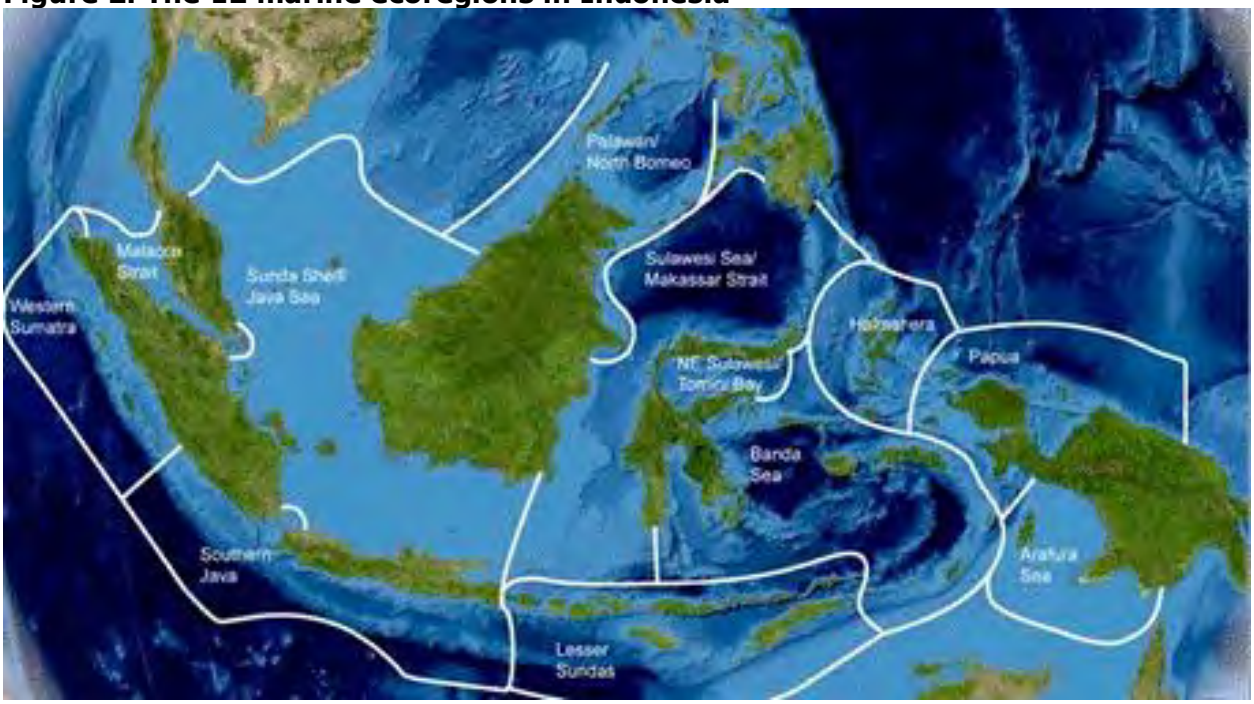
- FM1.2 Permanently open riverine estuaries and bays
- FM1.3 Intermittently closed and open lakes and lagoons
- M1.1 Seagrass meadows
- M1.3 Photic coral reefs
- M1.6 Subtidal rocky reefs
- M1.7 Subtidal sand beds
- M1.8 Subtidal mud plains

Maps of the ecosystems are under development and available at https://global-ecosystems.org/explore/groups/M1.3

For Wallacea, these broad ecosystem types can be sub-divided according to the marine ecoregions identified by Spalding (2007). Of 232 marine ecoregions defined globally, five cover Wallacea: Sulawesi Sea/Makassar Strait; Northeast Sulawesi/Tomini Bay; Halmahera; Banda Sea; and Lesser Sundas (Figure 2).

As an example, using this approach, the area of photic coral reef (*ecosystem functional groups* M3.1) in the Banda Sea (Ecoregion 131) could be calculated using existing mapping, and a site would meet the threshold for a KBA if it contains at least 5 or 10 percent of this ecosystem (depending on threat status).

Figure 2. The 12 marine ecoregions in Indonesia



Source: Huffard *et al.* (2012), recreated from Spalding *et al.* (2007).

To apply this criterion for identifying KBAs requires a second step: the assessment and classification of an ecosystem as threatened. No ecosystems in Wallacea have yet been assessed by the IUCN Red List of Ecosystems process, and, indeed, relatively few marine ecosystems have been assessed globally. Completing a Red List assessment was beyond the scope of the exercise to update the ecosystem profile. Given the importance and threat to the region's reefs and other marine ecosystems, it should be a priority. Examples of coral reef assessments are available from the Caribbean (Keith 2013) and Mesoamerica (Bland 2017).

The analysis of 74 marine KBAs in the original ecosystem profile was expanded to 140 sites, by including 66 candidate marine KBAs. The 140 marine KBAs cover a combined area of more than 9.4 million ha (Table 24). Their mean surface area is around 67,000 ha: almost twice that of terrestrial KBAs (34,000 ha). Taking terrestrial, freshwater and marine sites together, 398 KBAs have been identified in the Wallacea Hotspot, covering a combined area of 18,165,995 ha.

Table 24: Number of marine KBAs by bioregion

Bioregion	# KBAs	Area (ha)
Sulawesi	49	5,860,402
Maluku	39	2,760,452
Lesser Sundas	52	805,200
Total	**140**	**9,426,054**

A review of marine KBAs by stakeholders in Timor-Leste proposed that two of the 12 marine KBAs in the country be deleted: Raumoco (TLS004) and Kaibada (TLS011). This is because no data are available that support their classification as KBAs. Nevertheless, these sites were retained in this analysis pending review of their status as global KBAs.

Species data for marine KBAs and candidate marine KBAs were inadequate to allow ranking of sites based on vulnerability and irreplaceability, as was done for terrestrial KBAs. Instead, as described in Section 5.2.3, the marine corridors were ranked on the basis of their biological importance, along with the KBAs within them.

In Indonesia, a fundamental division of the legal status of land is into forest estate and non-forest estate. The forest estate is managed under the authority of the central Ministry of Environment and Forestry (although this has come under challenge in the last few years; see Chapter 6). It includes official protected areas but also watershed protection forests, and forests that can be exploited or (in some cases) converted. The forest estate in Indonesian Wallacea covers 19.8 million ha or 60 percent of the total land area, of which 2.9 million ha is set aside for conservation.

Over 6.9 million ha (82 percent) of the surface area of terrestrial KBAs in Indonesian Wallacea is within the national forest estate. Of this, 2.5 million ha is in official protected areas, 2.3 million ha is in forests designated for watershed protection and 2 million ha is in forests where licenses for timber exploitation or conversion to non-forest uses may be granted. Around half (1.3 million ha) of the 2.5 million ha of terrestrial KBAs within protected areas is within 18 national parks, each with its own budget and human resources. The remainder is in strict nature reserves, wildlife reserves and other conservation reserves, which are managed by regional Natural Resource Management Agency staff. Thus, 5.8 million ha (70 percent) of the surface area of terrestrial KBAs in Indonesian Wallacea lies outside formal protected areas.

In Timor-Leste, 44 sites are identified under Decree Law No. 5/2016, which created the National System of Protected Areas. Because the boundaries of the proposed new protected areas have not been fixed, it is not possible to ascertain what proportion of the KBAs is included in the protected areas.

Where a terrestrial and a marine KBA are contiguous, they should be considered and, ideally, managed as a single ecological unit. The KBA analysis retains the division between terrestrial and marine KBAs, only because there are differences in priority-setting methods, and because the quality and availability of data are typically better for terrestrial KBAs. A ranking and comparison of terrestrial, marine and combined KBAs would be difficult. In addition, there is an administrative reality that terrestrial conservation and marine conservation fall under the jurisdiction of different entities, be that different departments within a ministry in Timor-Leste, or different ministries in Indonesia (although there are exceptions in both cases, where a protected area managed by a single authority includes terrestrial and marine ecosystems).

In all, there are 65 terrestrial KBAs contiguous with 59 marine KBAs. In 38 cases, the terrestrial and marine KBAs share a border, while, in 27 cases, the terrestrial KBA is an island entirely within the marine KBA. In both situations, land management in the terrestrial KBA can be expected to influence the conservation status of the marine KBA. In addition,

many terrestrial KBAs protect forests in the upper catchments of rivers that drain into marine KBAs, even when the two sites are not contiguous.

Tables 25 to 28 and Figures 3 to 9 show the terrestrial and marine KBAs in each bioregion, with the Lesser Sundas divided into Indonesia and Timor-Leste. Each KBA is identified by a unique code.

Table 25: List of KBAs in the Sulawesi bioregion

KBA code	KBA name	KBA code	KBA name	KBA code	KBA name
IDN001	Kepulauan Nanusa	IDN051	Perairan Panua	IDN101	Mekongga
IDN002	Perairan Karakelang Utara	IDN052	Panua	IDN102	Kepulauan Padamarang
IDN003	Karakelang Utara	IDN053	Popayato–Paguat	IDN103	Lamadae
IDN004	Karakelang Selatan	IDN054	Gunung Ile-Ile	IDN104	Rawa Aopa Watumohai
IDN005	Pulau Salibabu	IDN055	Tanjung Panjang	IDN105	Teluk Lasolo–Labengki
IDN006	Perairan Talaud Selatan	IDN056	Perairan Tanjung Panjang	IDN106	Nipa-nipa
IDN007	Pulau Kabaruan	IDN057	Buol–Tolitoli	IDN107	Pulau Hari
IDN008	Kawaluso	IDN058	Gunung Dako	IDN108	Tanjung Peropa
IDN009	Perairan Sangihe	IDN059	Teluk Dondo	IDN109	Pulau Wawonii
IDN010	Gunung Awu	IDN060	Gunung Tinombala	IDN110	Tanjung Batikolo
IDN011	Tahuna	IDN061	Gunung Sojol	IDN111	Baito–Wolasi
IDN012	Gunung Sahendaruman	IDN062	Siraro	IDN112	Pesisir Tinanggea
IDN013	Mahangetang	IDN063	Perairan Maputi	IDN113	Selat Tiworo
IDN014	Perairan Siau	IDN064	Pasoso	IDN114	Muna Timur
IDN015	Pulau Siau	IDN065	Tanjung Manimbaya	IDN115	Buton Utara
IDN016	Perairan Tagulandang	IDN066	Pegunungan Tokalekaju	IDN116	Lambusango
IDN017	Perairan Biaro	IDN067	Lore Lindu	IDN117	Wabula
IDN018	Perairan Likupang	IDN068	Perairan Kayumaloa	IDN118	Ambuau
IDN019	Likupang	IDN069	Tambu	IDN119	Perairan Wakatobi
IDN020	Molaswori	IDN070	Perairan Tambu	IDN120	Wakatobi
IDN021	Mawori	IDN071	Lariang	IDN121	Pulau Batu Atas
IDN022	Tangkoko Dua Sudara	IDN072	Pambuang	IDN122	Basilika
IDN023	Selat Lembeh	IDN073	Danau Poso	IDN123	Pulau Kadatua
IDN024	Lembeh	IDN074	Morowali	IDN124	Gunung Watusangia
IDN025	Gunung Klabat	IDN075	Gunung Lumut	IDN125	Kepulauan Sagori
IDN026	Tulaun Lalumpe	IDN076	Tanjung Colo	IDN126	Mambuliling
IDN027	Danau Tondano	IDN077	Perairan Kepulauan Togean	IDN127	Mamuju
IDN028	Soputan–Manimporok	IDN078	Kepulauan Togean	IDN128	Perairan Mamuju
IDN029	Mahawu–Masarang	IDN079	Perairan Pagimana	IDN129	Pegunungan Latimojong
IDN030	Gunung Lokon	IDN080	Bakiriang	IDN130	Danau Tempe

KBA code	KBA name	KBA code	KBA name	KBA code	KBA name
IDN031	Gunung Manembo-nembo	IDN081	Perairan Peleng–Banggai	IDN131	Pallime
IDN032	Perairan Arakan Wawontulap	IDN082	Labobo–Bangkurung	IDN132	Perairan Pallime
IDN033	Amurang	IDN083	Kokolomboi	IDN133	Cani Sirenreng
IDN034	Gunung Sinonsayang	IDN084	Bajomote–Pondipondi	IDN134	Bantimurung Bulusaraung
IDN035	Gunung Ambang	IDN085	Timbong	IDN135	Bulurokeng
IDN036	Gunung Simbalang	IDN086	Balantak	IDN136	Kapoposang–Pangkep–Bulurokeng
IDN037	Bogani Nani Wartabone	IDN087	Perairan Balantak	IDN137	Komara
IDN038	Tanjung Binerean	IDN088	Pulau Seho	IDN138	Karaeng–Lompobattang
IDN039	Perairan Tanjung Binerean	IDN089	Taliabu Utara	IDN139	Kepulauan Selayar
IDN040	Pantai Modisi	IDN090	Perairan Taliabu Utara	IDN140	Pulau Selayar
IDN041	Milangodaa	IDN091	Buya	IDN141	Taka Bonerate
IDN042	Puncak Botu	IDN092	Loku	IDN142	Perairan Tana Jampea
IDN043	Molonggota	IDN093	Sanana	IDN143	Pulau Tana Jampea
IDN044	Perairan Molonggota	IDN094	Pulau Lifamatola	IDN144	Pulau Kalatoa
IDN045	Perairan Mas Popaya Raja	IDN095	Feruhumpenai–Matano	IDN357	Malili
IDN046	Mas Popaya Raja	IDN096	Danau Mahalona	IDN358	Nanggala
IDN047	Tangale	IDN097	Danau Towuti	IDN359	Pulau Tagulandang
IDN048	Muara Paguyaman Pantai	IDN098	Routa	IDN360	Danau Tiu
IDN049	Nantu	IDN099	Lamiko-miko	IDN361	Tolinggula
IDN050	Dulamayo	IDN100	Perairan Lamiko–Miko	IDN363	Gunung Hek

Figure 3. Map of KBAs in southern Sulawesi

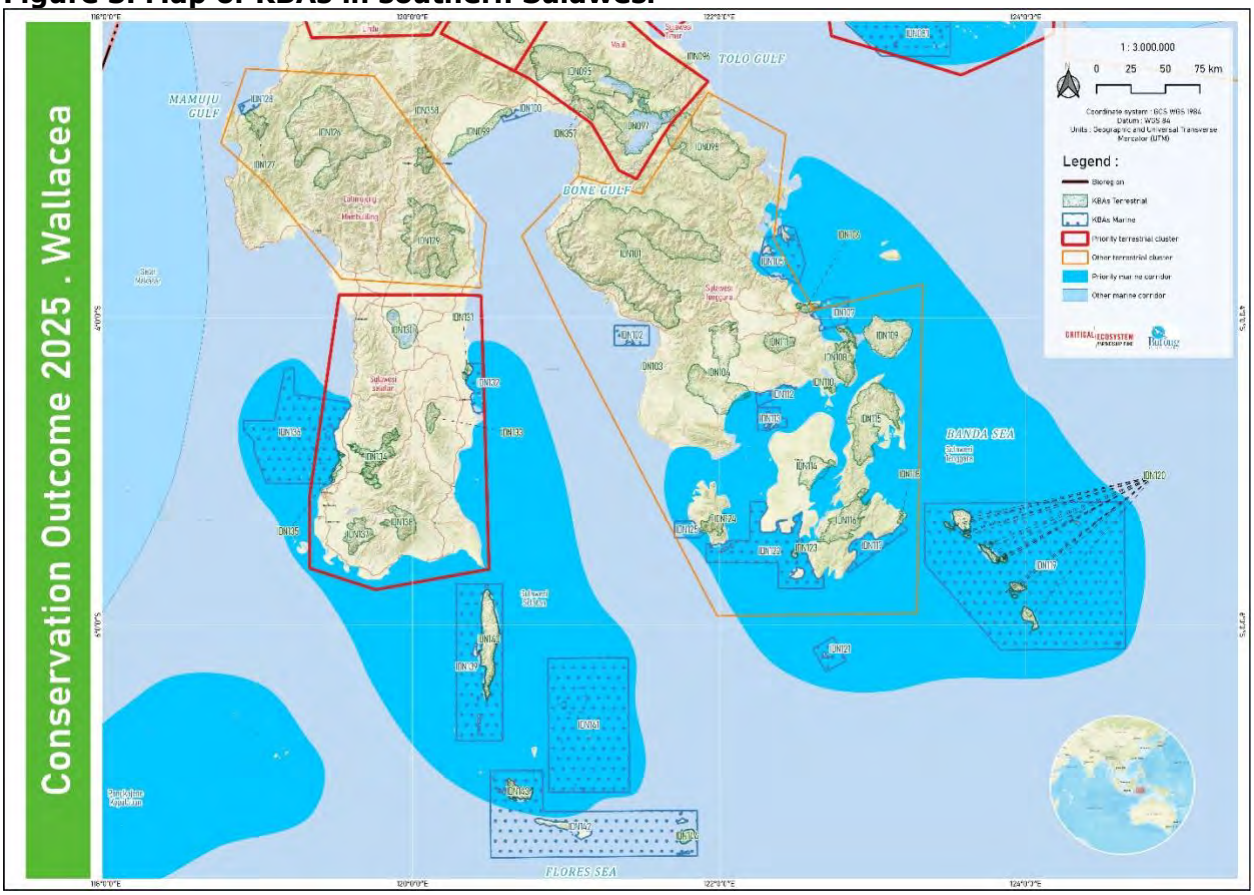


Figure 4. Map of KBAs in central Sulawesi

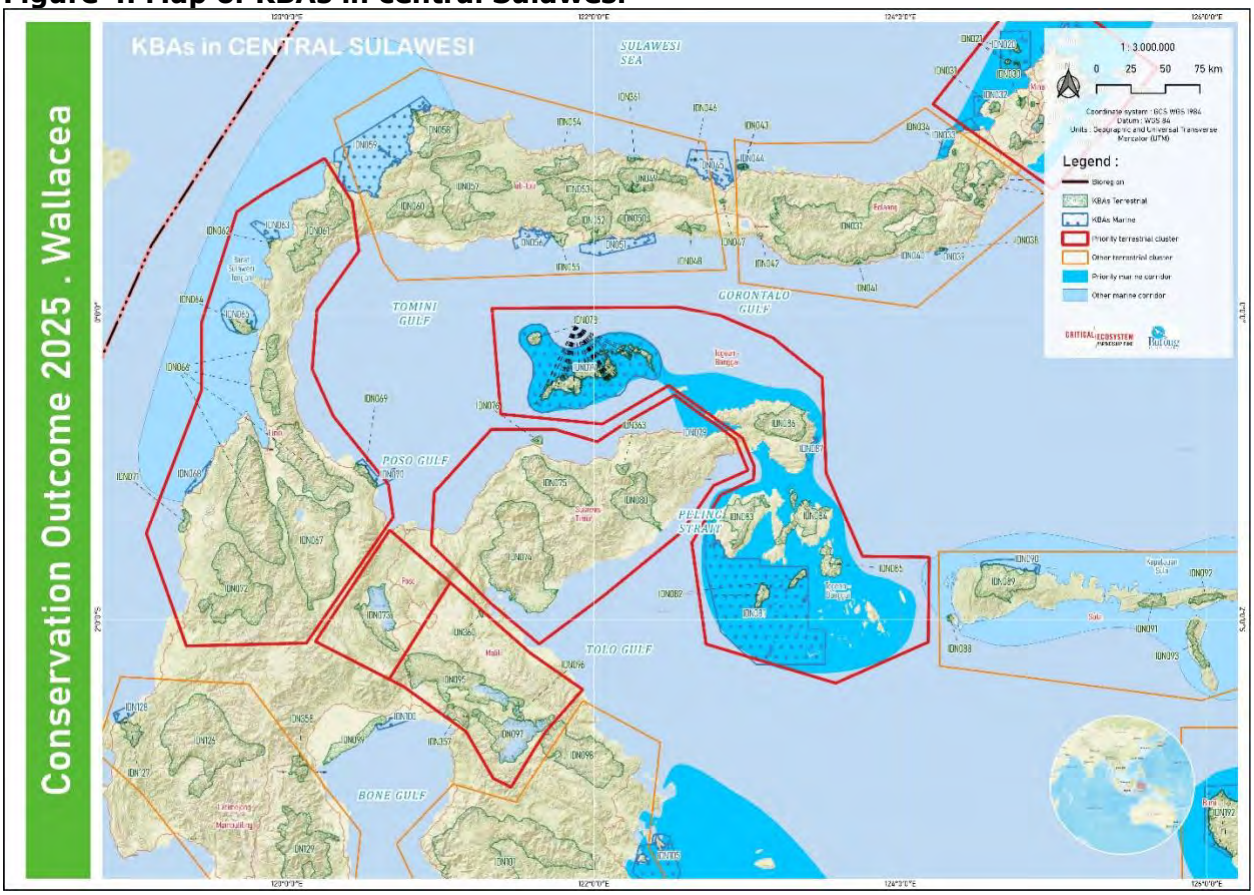


Figure 5. Map of KBAs in northern Sulawesi

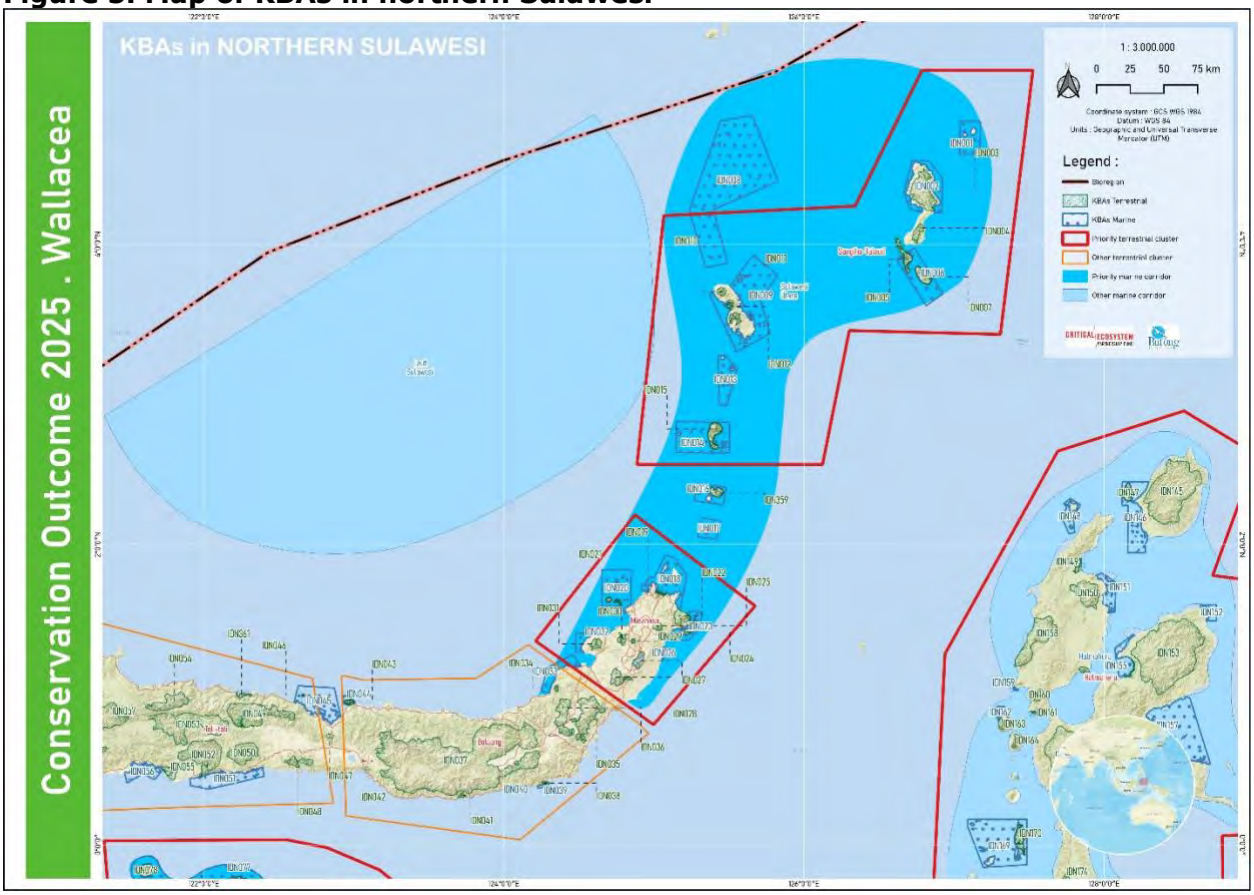


Table 26: List of KBAs in the Maluku bioregion

KBA code	KBA name	KBA code	KBA name	KBA code	KBA name
IDN145	Morotai	IDN177	Tutupa	IDN209	Perairan Haruku Saparua
IDN146	Pulau-pulau Pesisir Morotai	IDN178	Gunung Sibela	IDN210	Haruku
IDN147	Pulau Rao	IDN179	Mandioli	IDN211	Saparua
IDN148	Loloda	IDN180	Perairan Mandioli	IDN212	Manusela
IDN149	Galela	IDN181	Selat Obilatu–Malamala	IDN213	Waebula
IDN150	Gunung Dukono	IDN182	Obilatu	IDN214	Tanah Besar
IDN151	Pulau–Pulau Pesisir Tobelo	IDN183	Danau Manis	IDN215	Perairan Tanah Besar
IDN152	Jara-Jara	IDN184	Wayaloar	IDN216	Kepulauan Gorom
IDN153	Halmahera Timur	IDN185	Gunung Batu Putih	IDN217	Perairan Kepulauan Banda
IDN154	Hutan Bakau Dodaga	IDN186	Cabang Kuning	IDN218	Kepulauan Banda
IDN155	Teluk Wasile	IDN187	Selat Obi	IDN219	Perairan Kepulauan Tayandu
IDN156	Kao	IDN188	Pulau Obit	IDN220	Kepulauan Tayandu
IDN157	Teluk Buli	IDN189	Perairan Pulau Obit	IDN221	Perairan Tual
IDN158	Gamkonora	IDN190	Jorongga	IDN222	Pegunungan Daab-Boo
IDN159	Tanjung Bobo	IDN191	Liliali	IDN223	Pulau Manuk
IDN160	Tanah Putih	IDN192	Gunung Kepala Madang	IDN224	Perairan Pulau Manuk
IDN161	Rawa Sagu Ake Jailolo	IDN193	Waemala	IDN225	Kepulauan Lucipara
IDN162	Ternate–Hiri	IDN194	Danau Rana	IDN226	Pulau Gunung Api
IDN163	Ternate	IDN195	Leksula	IDN326	Kepulauan Kisar
IDN164	Tidore	IDN196	Teluk Kayeli	IDN327	Pulau Romang
IDN165	Aketajawe	IDN197	Perairan Teluk Kayeli	IDN328	Perairan Kepulauan Lemola
IDN166	Weda Telope	IDN198	Kelang–Kassa–Buano–Marsegu	IDN329	Kepulauan Lemola
IDN167	Dote-Kobe	IDN199	Pulau Buano	IDN330	Kepulauan Sermatang
IDN168	Perairan Dote-Kobe	IDN200	Gunung Sahuwai	IDN331	Kepulauan Damar
IDN169	Kayoa	IDN201	Luhu	IDN332	Pulau Damar
IDN170	Pulau Kayoa	IDN202	Tullen Batae	IDN333	Kepulauan Babar
IDN171	Kasiruta	IDN203	Pulau Kassa	IDN334	Pulau Babar
IDN172	Yaba	IDN204	Pegunungan Paunusa	IDN335	Perairan Angwarmase
IDN173	Gorogoro	IDN205	Gunung Salahutu	IDN336	Tanimbar Tengah
IDN174	Saketa	IDN206	Perairan Gunung Salahutu	IDN337	Selat Yamdena
IDN175	Kepulauan Widi	IDN207	Leitimur	IDN338	Pulau Larat
IDN176	Libobo	IDN208	Leihitu	IDN339	Kepulauan Larat–Fordata

Figure 6. Map of KBAs in southern Maluku

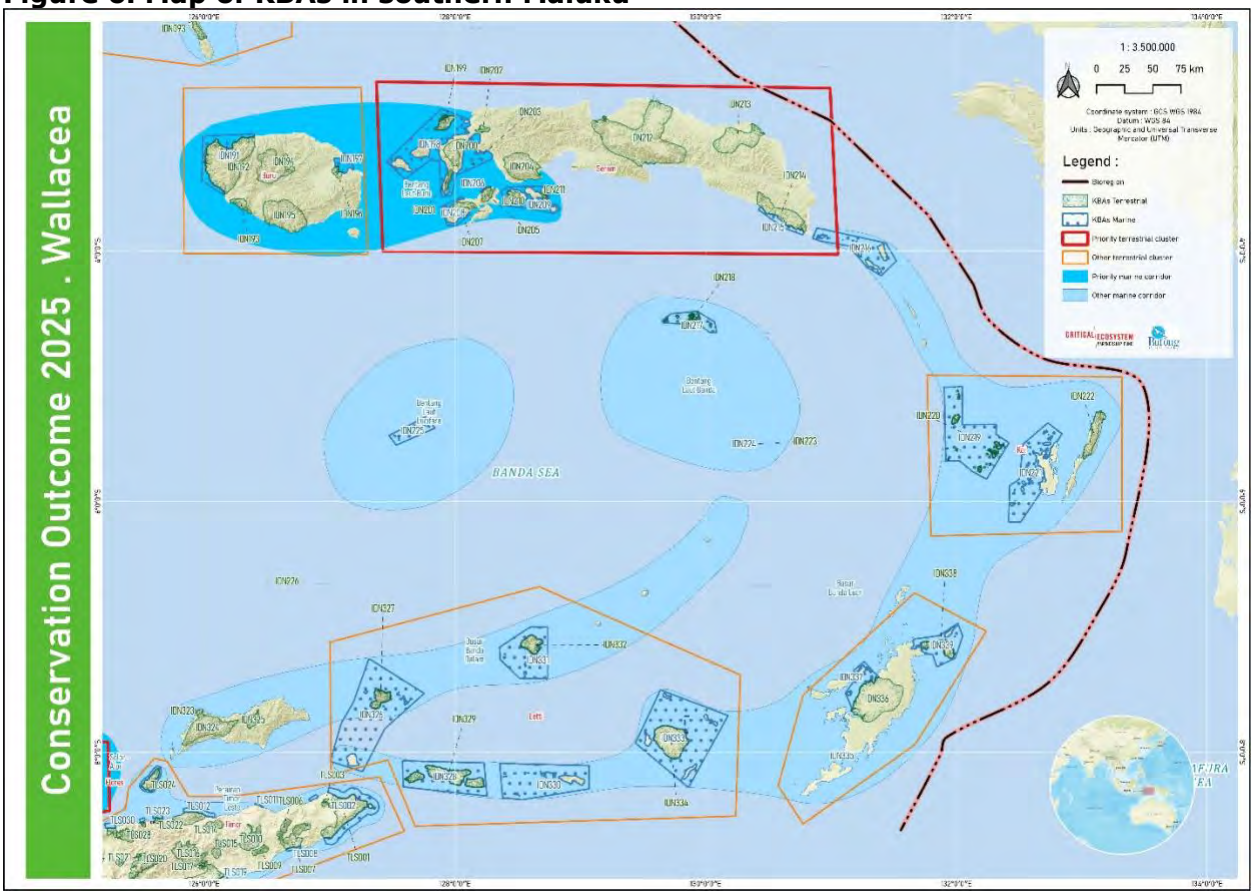


Figure 7. Map of KBAs in northern Maluku

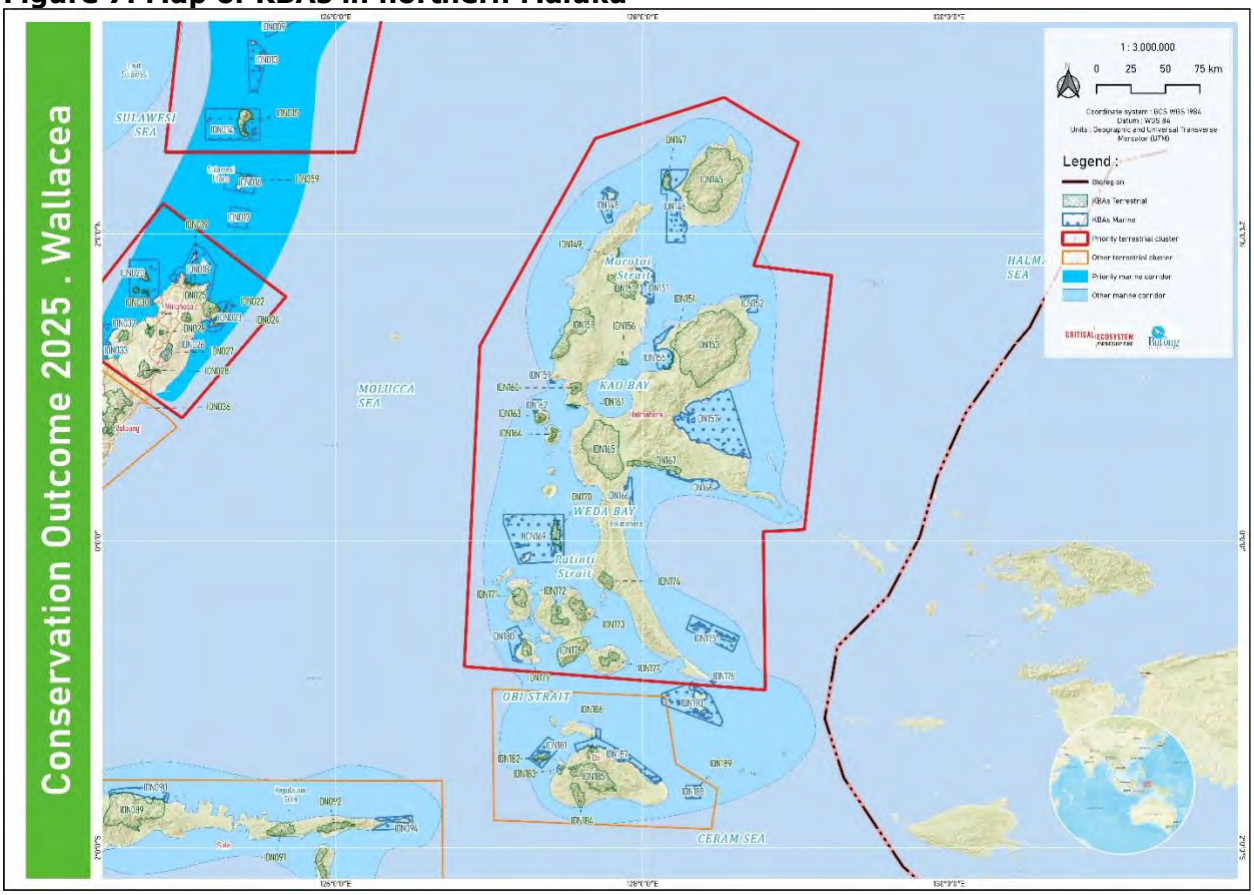


Table 27: List of KBAs in the Indonesian Lesser Sundas bioregion

KBA code	KBA name	KBA code	KBA name	KBA code	KBA name
IDN227	Batu Gendang	IDN266	Baliledo	IDN305	Ili Wengot
IDN228	Perairan Batu Gendang	IDN267	Pahudu Tilu	IDN306	Gunung Lewotobi
IDN229	Lombok Barat	IDN268	Manupeu Tanadaru	IDN307	Pantai Selatan Lebau
IDN230	Gili Ayer–Meno–Trawangan	IDN269	Tangairi–Lukulisi–Konda Maloba	IDN308	Larantuka
IDN231	Gunung Rinjani	IDN270	Perairan Tarimbang	IDN309	Tanjung Watupayung
IDN232	Gili Sulat–Gili Lawang	IDN271	Tarimbang	IDN310	Flores Timur
IDN233	Perairan Bumbang	IDN272	Lai Kayambi	IDN311	Perairan Lembata
IDN234	Bumbang	IDN273	Praipaha Mandahu	IDN312	Lamalera
IDN235	Sekaroh	IDN274	Yumbu–Kandara	IDN313	Lembata
IDN236	Lunyuk Besar	IDN275	Laiwanggi Wanggameti	IDN314	Selat Pantar
IDN237	Tatar Sepang	IDN276	Pulau Salura–Mangkudu–Kotak	IDN315	Pantar
IDN238	Taliwang	IDN277	Tanjung Ngunju	IDN316	Pantar Utara

KBA code	KBA name	KBA code	KBA name	KBA code	KBA name
IDN239	Sumbawa Barat	IDN278	Perairan Tanjung Ngunju	IDN317	Gunung Muna
IDN240	Pulau Panjang	IDN279	Luku Melolo	IDN318	Perairan Gunung Muna
IDN241	Puncak Ngengas	IDN280	Komodo–Rinca	IDN319	Mainang
IDN242	Dodo Jaranpusang	IDN281	Perairan Komodo–Rinca	IDN320	Perairan Alor Utara
IDN243	Perairan Pulau Moyo	IDN282	Wae Wuul	IDN321	Tuti Adagae
IDN244	Pulau Moyo	IDN283	Nggorang Bowosie	IDN322	Kunggwera
IDN245	Perairan Pulau Satonda	IDN284	Mbeliling–Tanjung Kerita Mese	IDN323	Pulau Redong
IDN246	Gunung Tambora	IDN285	Sesok	IDN324	Gunung Arnau
IDN247	Nisa–Teluk Saleh	IDN286	Nangalili	IDN325	Danau Tihu
IDN248	Empang	IDN287	Todo Repok	IDN340	Kateri–Maubesi
IDN249	Perairan Empang	IDN288	Ruteng	IDN341	Gunung Mutis
IDN250	Perairan Parado	IDN289	Gapong	IDN342	Buat–Soe
IDN251	Teluk Waworada	IDN290	Pota	IDN343	Oenasi
IDN252	Perairan Bajo	IDN291	Nangarawa	IDN344	Manipo
IDN253	Pulau Ular	IDN292	Gunung Inerie	IDN345	Camplong
IDN254	Sangiang	IDN293	Aegela	IDN346	Gunung Timau
IDN255	Gili Banta	IDN294	Wolo Tado	IDN347	Bipolo
IDN256	Pero	IDN295	Riung 17 Pulau	IDN348	Perairan Teluk Kupang
IDN257	Rokoraka–Matalombu	IDN296	Pulau Ontoloe	IDN349	Teluk Kupang
IDN258	Cambaka	IDN297	Mausambi	IDN350	Semau
IDN259	Danggamangu	IDN298	Kelimutu	IDN351	Perairan Rote Utara
IDN260	Yawila	IDN299	Paga	IDN352	Rote Utara
IDN261	Lamboya	IDN300	Tanjung Watu Mana	IDN353	Danau Peto
IDN262	Poronumbu	IDN301	Gunungsari	IDN354	Rote Barat Daya
IDN263	Pantai Mananga Aba–Pantai Waeketo	IDN302	Teluk Maumere	IDN355	Perairan Pulau Dana
IDN264	Kaliasin	IDN303	Pulau Besar	IDN356	Pulau Dana
IDN265	Lokusobak	IDN304	Egon Ilimedo	IDN362	Lakaan Mandeu

Figure 8. Map of KBAs in western Lesser Sundas

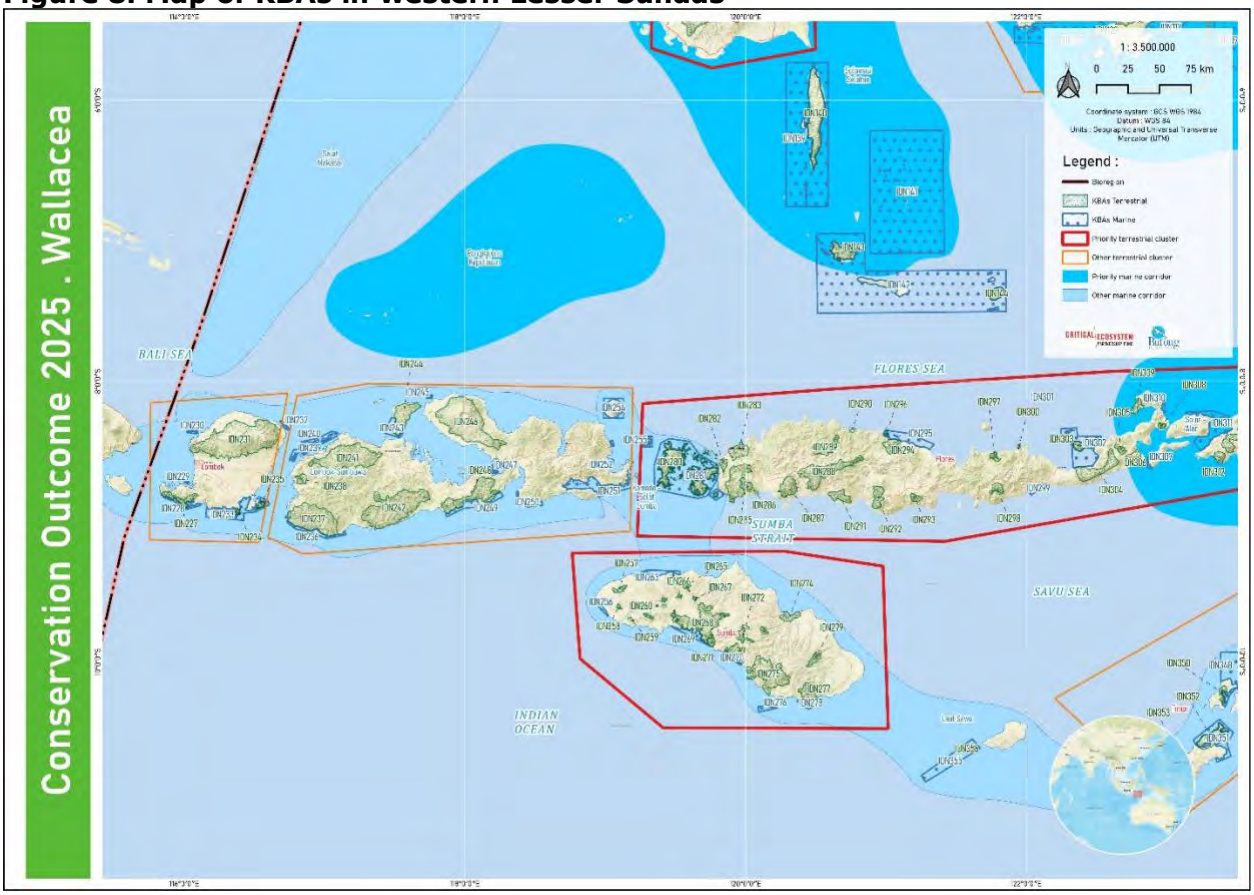


Figure 9. Map of KBAs in eastern Lesser Sundas (including Timor-Leste)

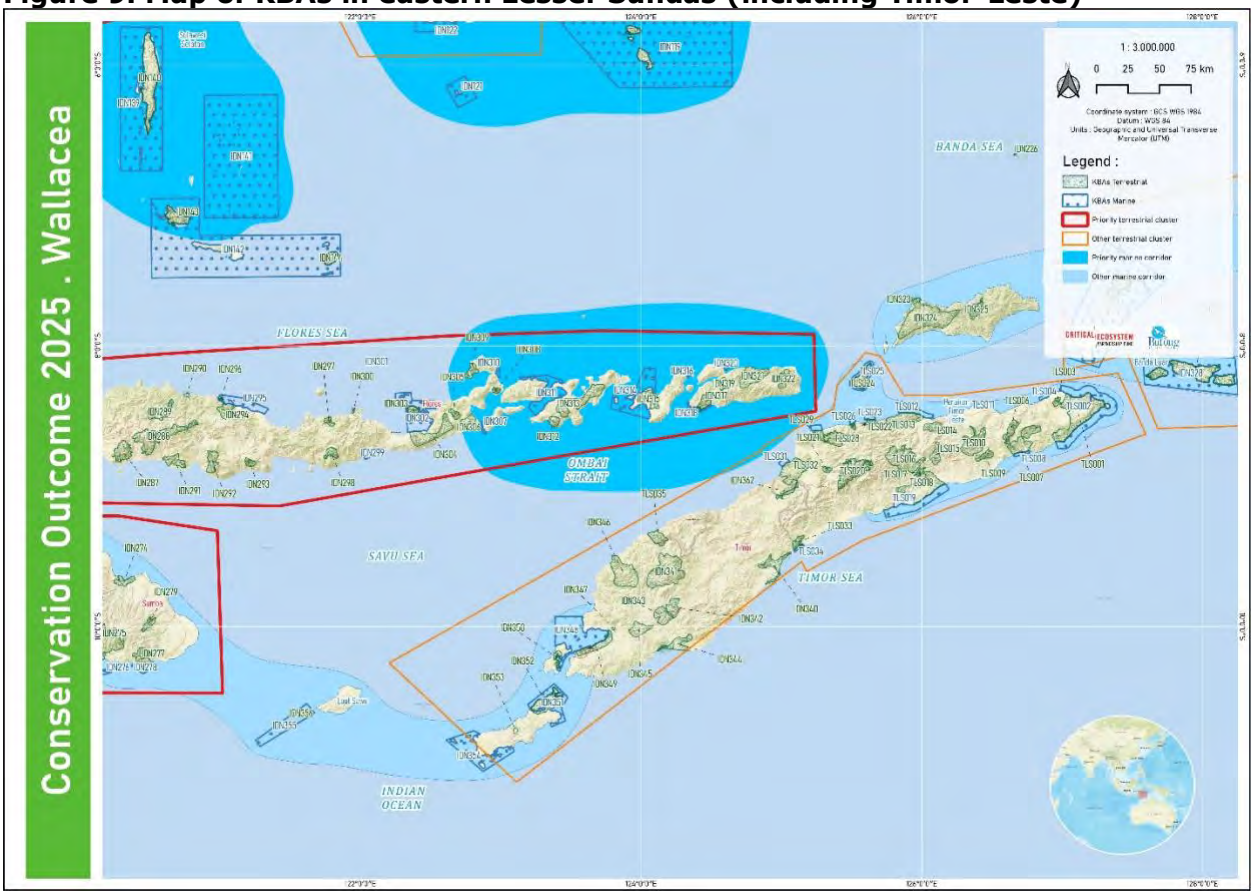


Table 28: List of KBAs in the East Timorese Lesser Sundas bioregion

KBA code	KBA name	KBA code	KBA name	KBA code	KBA name
TLS001	Nino Konis Santana	TLS013	Subaun	TLS025	Perairan Atauro
TLS002	Perairan Nino Konis Santana	TLS014	Laleia	TLS026	Perairan Tasitolu
TLS003	Nari	TLS015	Monte Aitana–Bibileo	TLS027	Tasitolu
TLS004	Raumoco	TLS016	Monte Diatuto	TLS028	Fatumasin
TLS005	Legumau	TLS017	Monte Mak Fahik–Sarim	TLS029	Maubara
TLS006	Monte Matebian	TLS018	Sungai Klere	TLS030	Perairan Maubara
TLS007	Irabere–Iliomar	TLS019	Perairan Sungai Klere	TLS031	Perairan Be Malae
TLS008	Perairan Irabere–Iliomar	TLS020	Monte Tatamailau	TLS032	Be Malae
TLS009	Monte Builo	TLS021	Leimia Kraik	TLS033	Tilomar
TLS010	Mundo Perdido	TLS022	Areia Branca no Dolok Oan	TLS034	Perairan Tilomar
TLS011	Kaibada	TLS023	Perairan Areia Branca no Dolok Oan	TLS035	Citrana
TLS012	Perairan Subaun	TLS024	Atauro Island		

5.2.3 Corridor outcomes

Terrestrial corridors
Terrestrial corridors were defined on the basis of the presence of landscape species and for the role of the corridor in maintaining ecosystem services and connectivity among KBAs. Of the 448 terrestrial and freshwater globally threatened species in the hotspot, 32 were judged to be landscape species, either on the basis of known information about their ecology or on an assumption based on large body size and relatively wide range. Species that are widely distributed outside the region or occur only as vagrants were excluded.

Compared to the 2014 list:

- Two species were deleted, as they are no longer included on the threatened list.
- Eight new landscape species were selected from among the species added to the list of globally threatened species in Wallacea.

The 10 landscape corridors defined in 2014 (Figure 10) were reviewed and found to hold all of the landscape species, with the exception of two species confined to single large islands: Tanimbar eclectus; and Banggai fruit-dove. These islands are not large enough to justify the identification of corridors on them, so no change was made to the list of terrestrial corridors. In practice, the corridors cover most of the remaining forest on the large islands of the hotspot. The definition of corridor boundaries used ecological (primarily forest) boundaries where possible but are necessarily approximate. Table 29 lists the landscape species and the corridors where they occur.

Table 29: Occurrence of landscape species in corridors

Scientific name	Common name	Status	Halmahera	Seram-Buru	Sumba	Sumbawa-Lombok	Timor-Wetar	Flores Forests	Flores Coast	North Sulawesi	Central Sulawesi	South Sulawesi
Acerodon celebensis	Sulawesi Fruit Bat	VU								x	x	x
Acerodon mackloti	Sunda fruit bat	VU			x	x	x	x	x			
Babyrousa celebensis	Sulawesi babirusa	VU								x	x	x
Bubalus depressicornis	Lowland anoa	EN								x	x	x
Bubalus quarlesi	Mountain anoa	EN								x	x	x
Cacatua alba	White cockatoo	EN	x									
Cacatua moluccensis	Salmon-crested cockatoo	VU		x								
Cacatua sulphurea	Yellow-crested cockatoo	CR			x		x	x				
Eclectus cornelia	Sumba Eclectus	EN			x							
Eclectus riedeli	Tanimbar Eclectus	VU										
Eulipoa wallacei	Mollucan scrubfowl	VU	x	x								
Harpyionycteris celebensis	Sulawesi harpy fruit bat	VU								x	x	x
Macrocephalon maleo	Maleo	EN								x	x	

Scientific name	Common name	Status	Halmahera	Seram-Buru	Sumba	Sumbawa-Lombok	Timor-Wetar	Flores Forests	Flores Coast	North Sulawesi	Central Sulawesi	South Sulawesi
Macrogalidia musschenbroekii	Sulawesi palm civet	VU								x	x	x
Nisaetus floris	Flores hawk-eagle	CR				x		x				
Nyctimene minutus	Lesser tube-nosed bat	VU		x								
Pteropus caniceps	North Moluccan flying-fox	VU	x									
Pteropus chrysoproctus	Moluccan flying-fox	VU		x								
Pteropus conspicillatus	Spectacled flying-fox	EN	x									
Pteropus griseus	Gray flying-fox	VU					x	x	x	x	x	x
Pteropus melanopogon	Black-bearded flying-fox	EN		x				x				
Pteropus ocularis	Ceram flying-fox	VU		x								
Pteropus temminckii	Temminck's flying-fox	VU		x								
Ptilinopus dohertyi	Red-naped fruit-dove	VU			x							
Ramphiculus subgularis	Banggai fruit-dove	VU										
Rhabdotorrhinus exarhatus	Sulawesi hornbill	VU								x	x	x
Rhyticeros cassidix	Knobbed hornbill	VU								x	x	x
Rhyticeros everetti	Sumba hornbill	EN			x							
Syconycteris carolinae	Halmahera blossom bat	VU	x									
Treron floris	Flores green pigeon	VU				x		x				
Treron psittaceus	Timor green pigeon	EN					x					
Varanus komodoensis	Komodo dragon	VU							x			
Total per corridor			**5**	**7**	**5**	**3**	**4**	**6**	**3**	**10**	**10**	**9**

The biological ranking of corridors used a complementarity approach. Central Sulawesi was ranked first, because it has the joint highest number of landscape species (10). North Sulawesi has the same set of species but was ranked lower because of its smaller area. Seram-Buru was ranked second, as it adds the largest number of additional species. Sumbawa-Lombok and Flores forests add the same two landscape species but Flores forests was ranked higher, because of its larger overall number of landscape species and larger area. Timor-Wetar and Flores coast both add one species but Timor-Wetar was ranked higher, because of its higher overall number of landscape species and larger size. Table 30 summarizes the biological ranking of terrestrial corridors. Further details on each corridor are provided in Appendix 4.

Figure 10. Map of terrestrial corridors in Wallacea

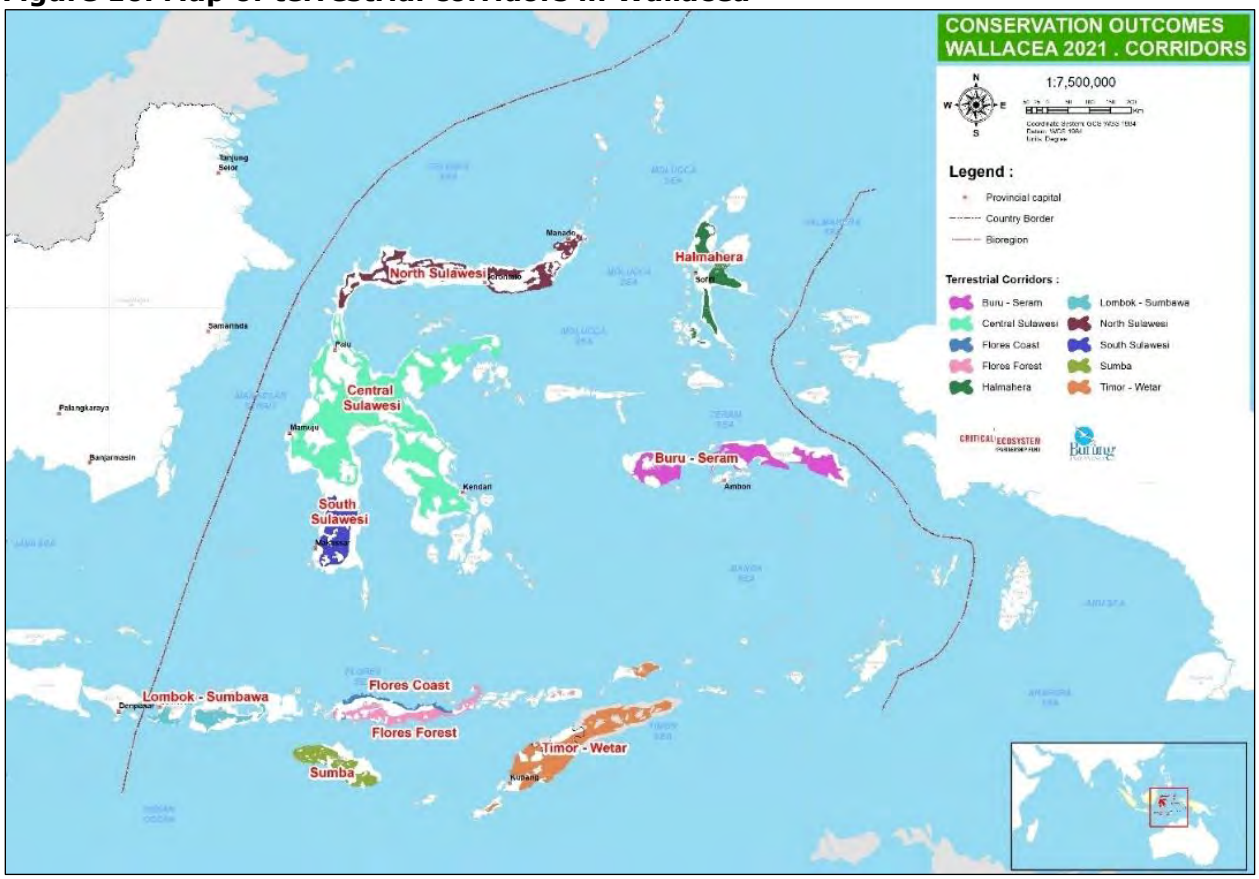


Table 30: Biological ranking of terrestrial corridors

Corridor	Rank	Province / country	Area (ha)
Central Sulawesi	1	Sulawesi Barat, Sulawesi Tengah, Sulawesi Selatan and Sulawesi Tenggara	6,243,989
Seram-Buru	2	Maluku	1,427,848
Sumba	3	Nusa Tenggara Timur	662,795
Halmahera	4	Maluku Utara	691,328
Flores Forests	5	Nusa Tenggara Timur	685,928
Timor-Wetar	6	Nusa Tenggara Barat and Timor-Leste	1,902,524
Flores Coast	7	Nusa Tenggara Timur	179,880
North Sulawesi	8	Sulawesi Utara and Gorontalo	1,279,252
South Sulawesi	9	Sulawesi Selatan	879,949
Sumbawa-Lombok	10	Nusa Tenggara Barat	475,605

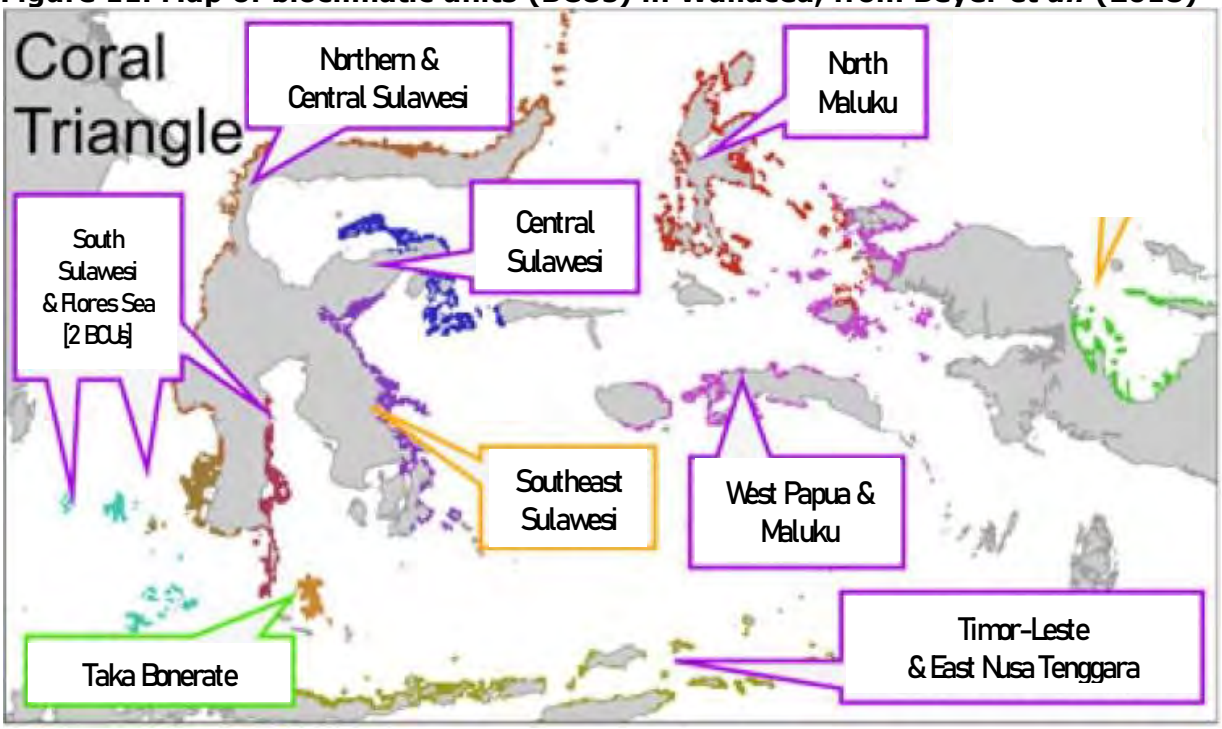
Marine corridors

Marine corridors encompass an areas that are important for groups of wide-ranging or migratory species, or for critical ecosystems and ecological processes, such as coral reefs and fish spawning grounds. In the 2014 ecosystem profile, marine experts helped identify

16 marine corridors where boundaries are approximations of the limits of the conservation value contained by the corridor.

Subsequent to the 2014 ecosystem profile, a global analysis by Beyer *et al.* (2018) identified a set of reefs using indicators of past, recent and predicted future thermal stress, larval connectivity and vulnerability to cyclone damage. This analysis divided reefs into regions (bioclimatic units or BCUs) containing approximately 500 km^2 of coral, and then identified the top 50 percent of those that perform best in relation to the indicators of stress. The analysis identified 162 BCUs worldwide, 50 of which optimize or maximize conservation outcomes. Ten BCUs from this list of 50 are within the boundaries of the Wallacea Hotspot (Figure 11).

Figure 11. Map of bioclimatic units (BCUs) in Wallacea, from Beyer *et al.* (2018)

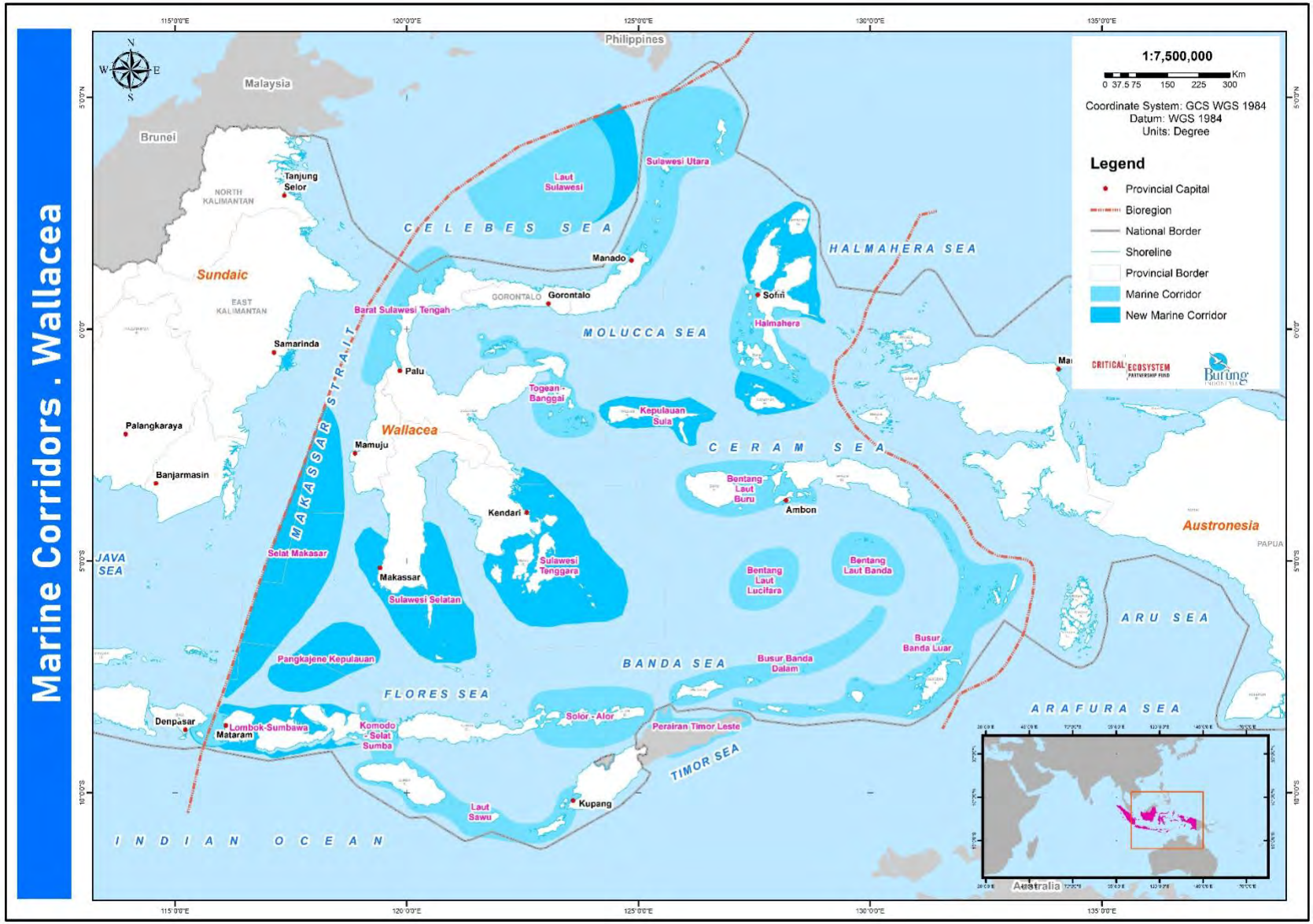


Note: Nusa Tenggara Barat is also included in Beyer *et al.* (2018) but does not appear on this map.

Experts reviewed the 16 marine corridors identified in the 2014 ecosystem profile in relation to the Beyer *et al.* (2018) BCUs and other information from the past six years. Based on the results of this review, the boundaries of three corridors were extended and five new corridors were added (Figure 12, Table 31). This created an updated set of 21 marine corridors (Figure 14, Appendix 4).

The Beyer *et al.* (2018) analysis also formed the basis of priority setting by the Bloomberg Philanthropies VOI. The VOI, Beyer *et al.* (2018) and CEPF geographies are broadly similar, with differences mainly in the grouping of priority areas and in the level of detail and level of analysis (Figure 13). Table 32 clarifies the relationship among the three sets of information.

Figure 12. Marine corridors in Wallacea in 2014, showing updates made in 2020



Note: Palung Timor marine corridor is not shown on this map.

Table 31: Rationale for new and amended marine corridors in Wallacea

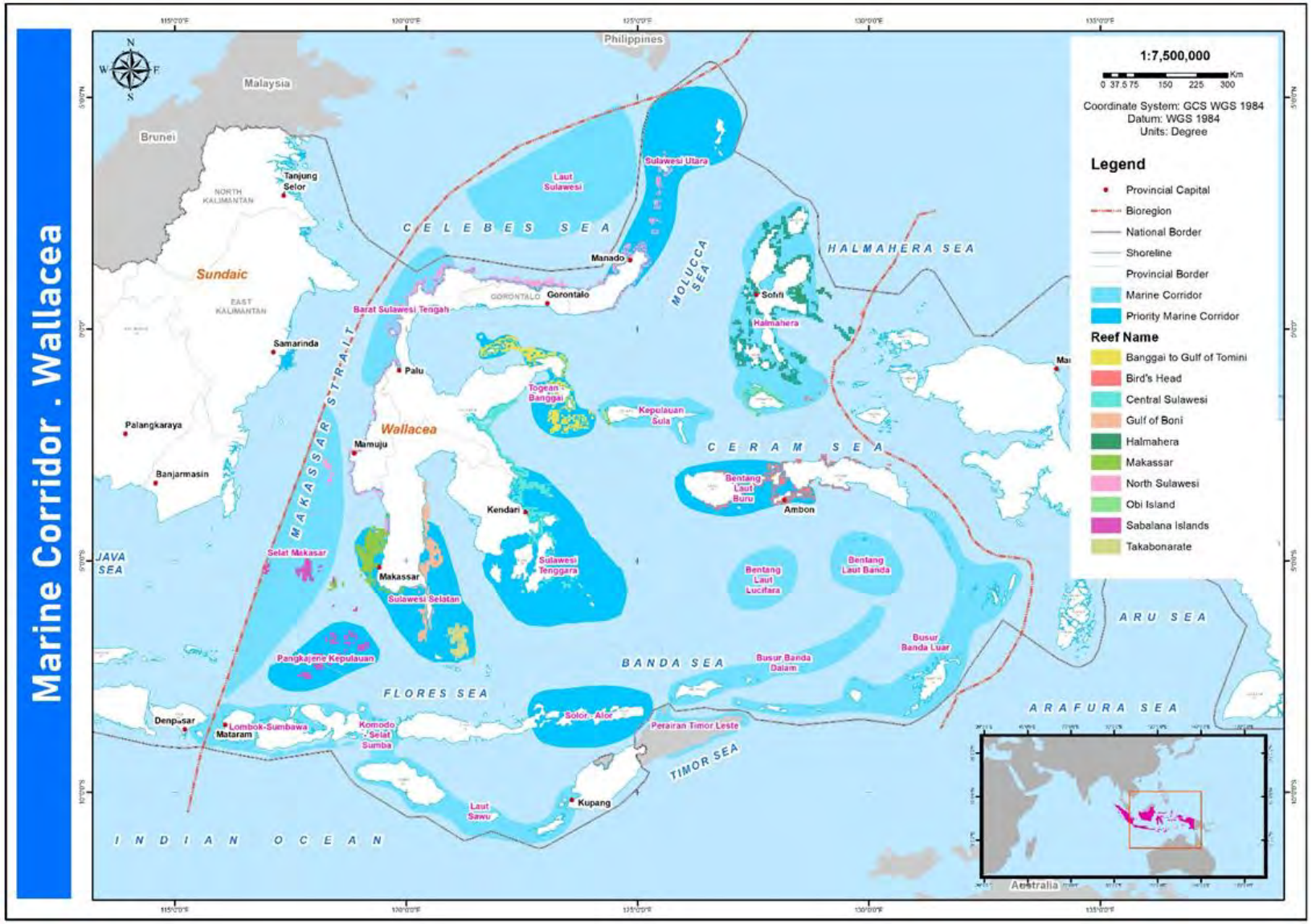
No.	Corridor name	Justification	Input
1	Selat Makassar*	This new corridor was added based on recent studies from Hadi *et al.* (2020) and Simeon *et al.* (2018) on shark distribution. Those studies found that this corridor is a key migration area for two protected sharks: silky shark (*Carcharhinus falciformis*); and scalloped hammerhead (*Sphyrna lewini*)	Irfan Yulianto / WCS
2	Pangkajene Kepulauan*	A widely scattered archipelago, this corridor was included on the list of 50 priority reefs by Beyer *et al.* (2018). It was already defined as important area for conservation in the national marine spatial plan (Rencana Tata Ruang Laut Nasional; RTRLN). In addition, it was defined as an important fisheries area (main fishing ground): Fisheries Management Area 714.	Toni Ruchimat / MMAF
3	Kepulauan Sula*	Recent findings showed that this corridor contains important habitat for green, hawksbill and leatherback turtles. Studies showed high abundance of the three species, including high rate of encounter during underwater surveys. The reefs at the western end of Sula Island were included on the list of 50 priority reefs by Beyer *et al.* (2018) (as part of Central Sulawesi BCU).	Marthen Welly / CTC-USAID SEA
4	Obi island (extension of Halmahera corridor)	The Halmahera corridor was extended to encompass the reefs and seas around Obi island, which are an important habitat for golden sea fan (*Isis hippuris*) and an important corridor for cetacean migration.	Marthen Welly / CTC-USAID SEA
5	North Halmahera (extension of Halmahera corridor)	The Halmahera corridor was extended to encompass the reefs and seas of all of Halmahera and Morotai island, including reefs, which are an important habitat for Wallacea-endemic walking sharks. This aligns with the list of 50 priority reefs by Beyer *et al.* (2018) (as part of North Maluku BCU).	USAID SEA, MMAF
6	Laut Sulawesi	This corridor was extended to include deep sea habitat (sea mounts), which support populations of tuna and other large pelagic species.	Budy Wiryawan / IPB
7	Sulawesi Selatan (including Taka Bonerate)*	This new corridor was added based on recent studies from Beyer *et al.* (2018) and Hoegh-Guldberg *et al.* (2018). It is a national and international priority.	Irfan Yulianto / WCS
8	Sulawesi Tenggara*	This new corridor was added based on recent studies from Beyer *et al.* (2018) and Hoegh-Guldberg *et al.* (2018). It is a national and international priority.	Irfan Yulianto / WCS
9	Lombok-Sumbawa	The Selat Lombok corridor was extended, to include the coastal waters of Lombok and Sumbawa. The corridor was renamed as Lombok-Sumbawa.	Irfan Yulianto / WCS

Note: * indicates new corridor.

Table 32: Summary of the relationship between CEPF Wallacea marine corridors and VOI priority reefs, with reference to Beyer *et al.* (2018)

CEPF Marine Corridor	VOI priority reef	Notes
Sulawesi Utara, Barat Sulawesi Tengah, Sulawesi Selatan (part)	North Sulawesi Makassar	The Beyer *et al.* "Northern and Central Sulawesi" BCU extends along the entire west coast of Sulawesi, while the CEPF corridors are focused on sub-sets. The southern end of the BCU, around Makassar, is in the South Sulawesi corridor.
Togean-Banggai, Kepulauan Sula	Banggai to Gulf of Tomini	The Beyer *et al.* "Central Sulawesi" BCU includes reefs at the western end of Sula Island. For CEPF, the whole of Sula is a separate corridor.
[none]	Gulf of Tomini	The Gulf of Tomini coastline outside of the Togean-Banggai area.
Sulawesi Tenggara	Southeast Sulawesi	The Beyer *et al.* "Southeast Sulawesi" BCU extends along the entire eastern flank of Southeastern Sulawesi but does not include all the reef areas around Buton and Wakatobi. The CEPF corridor includes these areas but does not extend as far north.
Sulawesi Selatan	Gulf of Bone Taka Bonerate Makassar	The Beyer *et al.* "South Sulawesi" BCU encompasses the western shore of the Gulf of Bone, while the corridor includes the reefs to Makassar (which are in the Northern and Central Sulawesi BCU) and does not extend as far up the Gulf of Bone. Taka Bonerate is a separate BCU but is included in the corridor.
Pangkajene Kepulauan	Sabalana Islands	The Beyer *et al.* "Flores Sea" BCU is near contiguous with the CEPF corridor. The Sabalana Islands reef Sabiana falls within both this corridor and the Makassar Strait corridor.
Solor-Alor, Perairan Timor Leste, Busur Banda Dalam (part), Busur Banda Luar (part)	Flores/Timor	The Beyer *et al.* "Nusa Tenggara -East Timor" BCU is largely contiguous with the four corridors, but the BCU extends further west along the north coast of Flores.
Komodo–Selat Sumba	[none]	The corridor is located at the western end of the Nusa Tenggara BCU and may partially overlap.
Lombok-Sumbawa	[none]	Overlaps with the Beyer *et al.* "West Nusa Tenggara" BCU.
Bentang Laut Buru	Birds Head (Maluku part included in the corridor)	The corridor covers Ambon, West Seram and Buru, a subset of the Beyer *et al.* "Maluku-West Papua" BCU.
Halmahera	Halmahera / Obi Island	The corridor, which includes Obi Island, is otherwise contiguous with the Beyer *et al.* "North Maluku" BCU.
Selat Makassar	Sabalana Islands	A section of the Sabalana reef is within the Selat Makassar corridor.
Bentang Laut Lucipara	[none]	Corridors identified for non-reef priorities; do not feature in the Beyer *et al.* analysis.
Bentang Laut Banda	[none]	Corridors identified for non-reef priorities; do not feature in the Beyer *et al.* analysis.
Laut Sulawesi	[none]	Corridors identified for non-reef priorities; do not feature in the Beyer *et al.* analysis.
Palung Timor	[none]	Corridors identified for non-reef priorities; do not feature in the Beyer *et al.* analysis.
Laut Sawu	[none]	Corridors identified for non-reef priorities; do not feature in the Beyer *et al.* analysis.

Figure 13. Overlap of reefs identified by Beyer *et al.* (2018) and CEPF corridors



Note: Palung Timor marine corridor is not shown on this map.

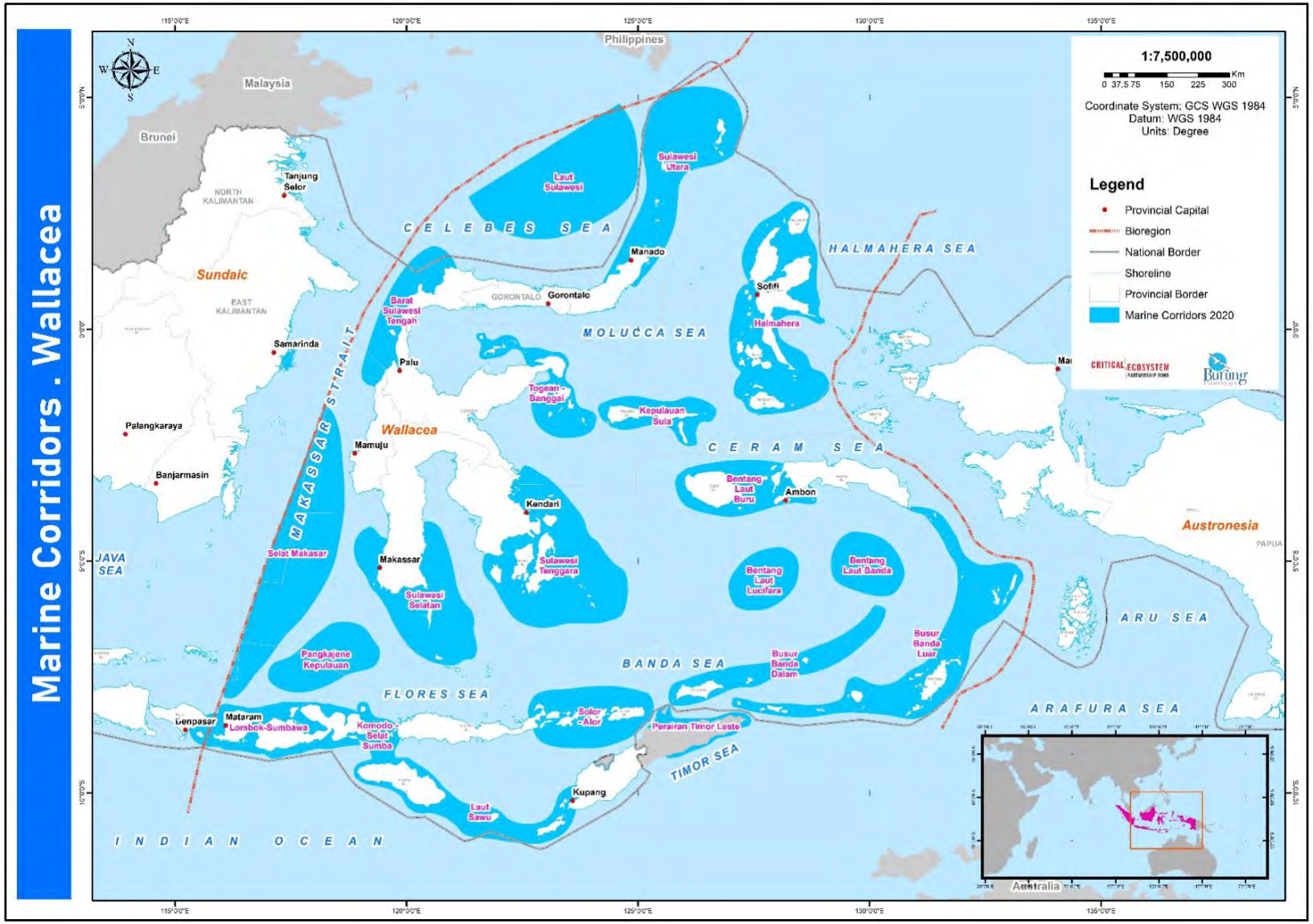
Ranking marine corridors objectively for their biological importance is difficult because relatively detailed surveys are only available for six corridors: Sulawesi Utara; Sulawesi Tenggara; Sulawesi Selatan; Perairan Timor Leste; Bentang Laut Banda; and Halmahera. Each of these corridors supports between 60 and 140 globally threatened marine species. The absence of species-level survey work in other corridors means that very few globally threatened species have been recorded there. However, expert informants ranked the corridors for biological importance using a simple scale: medium; high; and very high.

The results (Table 33) suggest that the Togean-Banggai, Solor-Alor and Halmahera corridors have the highest biological priority, while the others are almost equal in species richness. Two corridors, Palung Timor and Laut Sulawesi, do not contain coral reef or other near-shore habitats and are, therefore, assumed to have a far smaller complement of globally threatened species. These corridors were identified because of their importance for pelagic fishes and whales.

Table 33: Biological ranking of revised marine corridors

Corridor Name	Change with the 2020 update	Biological ranking
Halmahera	Expanded to include Obi island and North Halmahera	Very High
Solor–Alor	No change	Very High
Togean–Banggai	No change	Very High
Bentang Laut Banda	No change	High
Bentang Laut Lucipara	No change	High
Pangkajene Kepulauan	New corridor added	High
Sulawesi Tenggara	New corridor added	High
Sulawesi Utara	No change	High
Barat Sulawesi Tengah	No change	Medium
Bentang Laut Buru	No change	Medium
Busur Banda Dalam	No change	Medium
Busur Banda Luar	No change	Medium
Kepulauan Sula	New corridor added	Medium
Komodo–Selat Sumba	No change	Medium
Laut Sawu	No change	Medium
Laut Sulawesi	Expanded to the east	Medium
Lombok-Sumbawa	Expanded to include the coastal waters of Lombok and Sumbawa	Medium
Palung Timor	No change	Medium
Selat Makassar	New corridor added	Medium
Sulawesi Selatan	New corridor added	Medium
Perairan Timor Leste	No change	Medium

Figure 14. Marine corridors in Wallacea



Note: Palung Timor marine corridor is not shown on this map.

6. SOCIOECONOMIC CONTEXT

This chapter presents a general overview of the socioeconomic context for biodiversity conservation in the hotspot. It reviews the main trends in socioeconomic development over recent decades and the principal economic sectors operating in the region.

The chapter covers Indonesian Wallacea and Timor-Leste separately. Indonesian Wallacea accounts for 96 percent of the population in the region, and Timor-Leste the other 4 percent. The rate of growth of GDP for the provinces in Indonesian Wallacea was between 3.9 and 8.83 percent in 2019 (BPS 2020), while that of Timor-Leste was 16.4 percent (but this follows two years of negative growth and more modest growth before that). However, the impact of the Covid-19 pandemic reversed economic growth across the region in 2020. At US$4,450 per capita (2019, 2010 constant prices), Indonesia's GDP remains considerably higher than Timor-Leste's, which was US$977 in 2019 (World Bank 2021).

6.1 Indonesia

Wallacea has a long history of human occupation, trade, agricultural development and resource extraction (timber, fish, copper, nickel). Over the centuries, the region has attracted traders (and invaders) from Java, China, Malaya, Portugal, Spain, England and the Netherlands. Their interaction with the local economies, culture and social structures has had a profound impact on the landscape of the hotspot (Monk *et al.* 1997).

The islands of Indonesian Wallacea are traditionally associated with low incomes, high poverty levels, and low levels of access to health and education. Although the region still lags behind other parts of the country when it comes to socioeconomic development, a more nuanced review is now necessary, given the rate of economic development. In some parts of Sulawesi, for example, the social and economic indicators have improved considerably. Even in the perennially poor region of Nusa Tenggara Timur, the social and economic indicators give some reasons for optimism. Economic development, however, relies on intensive exploitation of the natural resources and biodiversity base. In doing so, it is undermining the sustainability of the economy and putting Wallacea's unique ecosystems under increasing pressure.

6.1.1 Social and demographic trends

Regional demographics
The population of Indonesian Wallacea was 33,674,469 in 2020, making up only 12.5 percent of the total Indonesian population. Sulawesi, which covers 9.9 percent of the country, has only 7.3 percent of the national population; Maluku, covers 4.1 percent of the country and has only 1.1 percent of the population. By way of contrast, Java covers only 6.8 percent of the country but has 57.5 percent of the population (BPS 2020).

Population growth rates in Wallacea are higher than the national average but slowed from 2.4 percent per year between 2000 and 2010 to 1.5 percent per year from 2010 to 2020. The overall figure for Indonesia during the same period was 1.31 percent (Table 34). The population continues to grow in all provinces, with highest growth rates, of over 2 percent per year, in Maluku, Maluku Utara and Sulawesi Barat. The lowest rates of population growth are in the relatively densely populated regions of Gorontalo and Sulawesi Selatan.

Overall population density is 1.01 people per hectare, lower than the national average of 1.4 people per hectare. Population density varies greatly by island (Table 34). The highest in Wallacea is in Nusa Tenggara Barat province, at 2.86 people per hectare, concentrated on the two largest islands, Lombok and Sumbawa. In Nusa Tenggara Timur, population density is just over 1 person per hectare but local population densities vary from less than 0.2 people per hectare in the driest areas, such as in East Sumba and eastern Flores, to about 1.4 people per hectare in the wetter, more fertile areas. Sulawesi is the most heavily populated of all the islands in the hotspot with population densities high in the north (Sulawesi Utara and Gorontalo) and south (Sulawesi Selatan), reflecting the presence of two of eastern Indonesia's most important urban centers: Manado; and Makassar. Maluku and Maluku Utara have the smallest populations and lowest populations densities of all the provinces in the hotspot, a total of 3.1 million people, at an average density of 0.4 people per hectare. In fact, much of the population is in the city of Ambon, with large areas of sparsely occupied land.

Table 34: Basic Population Statistics for the Wallacea Hotspot in Indonesia (2020)

Province	Population	Population Density (people per hectare)	Average % Annual Population Growth (2010–2020)
Gorontalo	1,171,681	1.04	1.26
Maluku	1,848,923	0.39	2.06
Maluku Utara	1,282,937	0.40	2.36
Nusa Tenggara Barat	5,320,092	2.86	1.82
Nusa Tenggara Timur	5,325,566	1.09	1.37
Sulawesi Barat	1,419,229	0.85	2.25
Sulawesi Selatan	9,073,509	1.94	1.29
Sulawesi Tengah	2,985,734	0.48	1.33
Sulawesi Tenggara	2,624,875	0.69	1.76
Sulawesi Utara	2,621,923	1.89	1.55
Total Indonesian Wallacea	**33,674,469**	**1.01**	**1.56**
Total Indonesia	**270,203,917**	**1.4**	**1.31**

Source: BPS (2020).

Employment, migration and urbanization

The urbanization rate in Indonesia has increased dramatically in recent years, with over half (56 percent) of all Indonesians now living in urban areas. While the provinces in Wallacea are between 23 and 54 percent urban, below the national average, the trend of increasing urbanization is shown by the growth in the urban population in the last 10 years. Only Maluku and Maluku Utara provinces have shown little increase in urban population. Sulawesi Utara and Nusa Tenggara Barat are the two most urbanized provinces (Table 35).

Migration appears to be a relatively minor contributor to population change. Net migration (the number of people whose address was another province five years before the census) varies between 1.31 (Nusa Tenggara Barat) and -0.77 percent (Maluku) (BPS 2020).

Table 35: Percentage of population in urban areas by province 2010 and 2020

Province	Urban Percentage 2010	Urban Percentage 2020
Sulawesi Utara	45.2	54.7
Nusa Tenggara Barat	41.7	49.4
Sulawesi Selatan	36.7	45
Gorontalo	34	44
Maluku	37.1	38.9
Sulawesi Tenggara	27.4	35
Sulawesi Tengah	24.3	30.5
Maluku Utara	27.1	28.5
Nusa Tenggara Timur	19.3	24.3
Sulawesi Barat	22.9	23
Total Indonesian Wallacea	**32.5**	**39.1**
Total Indonesia	**49.8**	**56.7**

Source: BPS (2020).

Poverty and human development

Although the absolute number of poor people in Wallacea has increased over the last 10 years, growth in population means that the proportion of poor people has declined slightly, from 14.7 (2012) to 13.1 percent (2020). Poverty levels remain above the national average, however, and the rate of reduction is less than the national trend, which has seen poverty levels fall from 12.1 to 10.2 percent over the same period (Table 36).

Table 36: Number and percentage of poor people by province in the hotspot, 2020

Province	Total number of poor people, 2020	Number of poor people as percent of total population	Number of rural poor as percent of total rural population	Number of urban poor as percent of total urban population
Gorontalo	185,310	15.8	25.0	4.2
Maluku	322,400	17.4	24.1	6.9
Maluku Utara	87,520	6.8	7.6	4.9
Nusa Tenggara Barat	746,040	14.0	13.2	14.8
Nusa Tenggara Timur	1,173,530	22.0	26.2	9.2
Sulawesi Barat	195,050	13.7	12.0	8.6
Sulawesi Selatan	800,240	8.8	12.1	4.8
Sulawesi Tengah	403,740	13.5	15.2	9.6
Sulawesi Tenggara	317,320	12.1	14.3	8.0
Sulawesi Utara	195,850	7.5	10.5	5.0
Total Indonesian Wallacea	**4,427,000**	**13.1**	**16.3**	**8.0**
Indonesia	**27,549,690**	**10.2**	**13.3**	**7.9**

Source: Calculated from BPS (2020).

Poverty is a mainly rural phenomenon in Wallacea, with rural poverty rates averaging over 16 percent, while urban poverty averages 8 percent. Only Nusa Tenggara Barat is different from this trend, with marginally greater numbers and percentage of poor people in urban areas in 2020.

There are marked differences in poverty rates between provinces. Nusa Tenggara Timur had a poverty rate of 22 percent and over a quarter (27 percent) of all the poor people in Wallacea in 2020. Nusa Tenggara Barat and Maluku also have high poverty rates. By contrast, Maluku Utara, Sulawesi Selatan and Sulawesi Utara stand out as the three provinces with the lowest poverty rates, all under 10 percent, and all less than the national average.

In terms of the Human Development Index (HDI) score, the provinces of Wallacea rank between 6th (Sulawesi Utara) and 32nd (Nusa Tenggara Timur) among Indonesia's 34 provinces. Six provinces rank lower than they did 10 years ago, however, while only Sulawesi Selatan and Sulawesi Tenggara have significantly improved their standing (Table 37). Only Sulawesi Utara is above the national HDI score.

Table 37: Human Development Index and other key indicators by province in the hotspot

Province	HDI	Change in HDI rank since 2010	Gender Development Index (2020)	Change in GDI since 2010	Life expectancy (2020)	Number of years in school (2020)	Change in years of school since 2010
Gorontalo	68.68	-3	70.74	+15.1	68.07	8.26	+1.06
Maluku	69.49	-6	75.54	+8.3	65.98	10.2	+1.6
Maluku Utara	68.49	+2	77.28	+12.9	68.33	9.42	+1.22
Nusa Tenggara Barat	68.25	+3	51.96	-4.1	66.51	8.08	+1.48
Nusa Tenggara Timur	65.19	-1	74.53	+9.9	67.01	8.09	+1.49
Sulawesi Barat	66.11	-4	65.92	+2.8	65.06	8.33	+1.23
Sulawesi Selatan	71.93	+7	76.32	+13.9	70.57	8.86	+1.46
Sulawesi Tengah	69.55	-3	75.78	+10.4	68.69	9.09	+1.19
Sulawesi Tenggara	71.45	+8	72.54	+8.7	71.22	9.41	+1.51
Sulawesi Utara	72.93	-4	78.98	+7.9	71.69	9.74	+0.94
Indonesia	**71.94**		**91.06**	**+23.26**	**71.47**	**8.9**	

Source: BPS (2020).

The Gender Development Index shows a significant improvement nationally since 2010, of +23.26 points, and all but one of the provinces in Wallacea show the same trend, albeit with less marked improvement. Only Nusa Tenggara Barat shows a decline in the Gender Development Index figure, to 51.96, by far the lowest in the region (Table 37).

Life expectancy remains slightly lower than the national average for all provinces except Sulawesi Utara. The number of years in school is close to the national average, 8.9 years, with Maluku (10.2 years) significantly above. All provinces show an increase of a year or more in the total number of years of schooling when compared to 2010 figures (Table 37).

Culture, ethnicity, languages and religion

Wallacea is home to many ethnic groups with a distinct culture, language and heritage. There is no one dominant ethnic group but there is instead a complex mixture of large numbers of groups spread across the region (Aspinall 2010). Nusa Tenggara Timur is one of the most ethnically plural provinces in Indonesia (Barlow and Gondowarsito 2009). Bahasa Indonesia is spoken across the hotspot but in each subregion there are local languages (Table 38).

Table 38: Ethnicity, religions and languages in Wallacea

Province	Major Ethnic Groups	Majority Religion	Other Religions	Local Languages
Sulawesi Utara	Minahasa	Christianity	Islam, Hinduism, Buddhism	Minahasa, Manado
Gorontalo	Gorontaloan, Mongondow	Islam	Christianity, Hinduism, Buddhism	Gorontalo
Sulawesi Tengah	Butung, Kaili, Bugis, Tolaki, Gorontaloan	Islam	Christianity	Butung, Kaili, Bugis, Tolaki, Gorontaloan
Sulawesi Barat	Mandar	Islam	Christianity, Hinduism	Mandar, Toraja, Bugis, Makassar
Sulawesi Selatan	Bugis, Makassar, Toraja	Islam	Christianity, Buddhism	Bugis, Makassar, Toraja
Sulawesi Tenggara	Buton, Bugis, Tolaki, Muna	Islam	Christianity, Hinduism	Buton, Bugis
Nusa Tenggara Barat	Sasak, Bima, Sumbawa, Indian, Balinese	Islam	Hinduism, Buddhism	Sasak, Balinese,
Nusa Tenggara Timur	Atoni, Manggarai, Sumba, Belu, Lamaholot, Rote, Lio	Christianity	Islam	Kambera, Anakalangu, Manggarai, Riung
Maluku Utara	Melanesian, Kei, Ambonese, Buton, Malay, Javanese, Chinese	Islam	Christianity	Ternate
Maluku	Melanesian, Kei, Ambonese, Buton, Malay, Javanese, Chinese	Islam	Christianity, Hinduism	Kei, Buton, Ambon

Source: Compiled from BPS (2010).

Wallacea's interaction with numerous cultures over the ages (Indian, Chinese, Melanesian, Polynesian, Portuguese, Arabian, English, Dutch, etc.) has resulted in an interweaving of religions throughout the hotspot: Hinduism, Buddhism, Islam and Christianity are all found in Wallacea. Islam is the religion of the majority in all provinces except Sulawesi Utara and Nusa Tenggara Timur, where Christianity predominates (Table 38). Although most people identify themselves as Muslims or Christians, they often subscribe to local beliefs and deities as well.

Throughout Wallacea, there are numerous traditional societies that have evolved systems to protect, conserve and manage the natural resources on which they depend, and to ensure equitable distribution of these resources. Anthropological studies indicate that hotspots of high biodiversity are associated with regions where traditional societies are frequently found. There are numerous examples in Wallacea of traditional knowledge systems (Pattiselanno and Arobaya 2013). One of the best known and most intensely studied

traditional resource management systems is an indigenous resource conservation and management tradition in Maluku known as *sasi*. *Sasi* is used for marine, coastal and terrestrial resources, and may involve limits on access, off-take, hunting methods or timing of hunting and harvesting as ways to ensure that over-exploitation does not take place. Although *sasi* has transformed with time and its scope differs from location to location, projects (including work funded by CEPF under Phase I in Wallacea) has shown that it can be used as a basis for building local level natural resource management institutions (Zerner 1994, Novaczek *et al.* 2001).

Livelihoods in Indonesian Wallacea
The range of livelihoods in Wallacea is diverse, from the 1.5 million urban dwellers in the economic hub of Makassar, to hunter-gatherers in the depths of the forests of Halmahera and Seram. As noted in Section 6.1.1.1, the majority of the people in Wallacea are still rural based and depend on agriculture or the sea for their livelihoods.

Most of the references to marine-based livelihoods in Wallacea are related to the remarkable fishing and sailing exploits of ethnic communities originating from different places in Indonesia. The Bugis, Makassar, Butonese, Madurese and Bajau sailing groups have long plied the waters of Maluku and even further to the east of Indonesia, exploiting trade and fishing opportunities. Their long-range networks extend across transient and semi-permanent coastal settlements throughout the islands of the region. Historically, they have been the dominant and most visible fishing communities in the region (Southon 1995, Stacey 1999, Fox 2000, Dwyer 2001).

Coastal communities in Indonesia, in general, have strong physical and cultural bonds to their environment and rely heavily for their livelihoods on resources from the surrounding sea. Today, however, many of these traditions are being weakened with the introduction of external values, ideas and consumer products. While some of these changes are welcomed and embraced by communities, many of the advocates of traditional knowledge and practices are now struggling to maintain their identity and culture. Conservation of resources is an idea that has both traditional and modern foundation, and many of the projects in CEPF Phase I showed how conservation outcomes could be achieved by blending traditional ideas with modern approaches in a process driven by community members themselves.

6.1.2 Economic context

Economic trends in Indonesian Wallacea
As Table 39 indicates, economic growth in the provinces of Indonesian Wallacea was between 3.9 and 8.8 percent in 2019, prior to the Covid-19 pandemic. The growth rate is significantly below the rate reported in 2010, however, for all but three provinces, and, of these three, only one, Sulawesi Tengah, shows a marked increase in growth rate. Nine of the 10 provinces have a GDP growth rate higher than the national average, however, continuing a trend seen in 2010. The provinces of Nusa Tenggara Barat and Nusa Tenggara Timur remain the worst performers in terms of GDP growth, as they were in 2010. All the provinces were hit by the Covid-19 pandemic in 2020, with only Maluku Utara and Sulawesi Tengah maintaining growth in the economy over the year. The fisheries, forestry and agriculture sectors are the main contributors to regional GDP, comprising over 20 percent each, while mining contributes 15 to 20 percent.

Table 39: Percentage annual change in GDP in Indonesian Wallacea, 2010–2020

Province	2010	2019	2020
Gorontalo	11.91	6.4	-0.02
Maluku	6.47	5.41	-0.92
Maluku Utara	7.96	6.1	+4.92
Nusa Tenggara Barat	6.29	3.9	-0.64
Nusa Tenggara Timur	5.13	5.24	-0.83
Sulawesi Barat	8.19	5.67	-2.42
Sulawesi Selatan	6.29	6.91	-0.7
Sulawesi Tenggara	8.18	6.5	-0.65
Sulawesi Utara	7.12	5.65	-0.99
Sulawesi Tengah	7.62	8.83	+4.86
Indonesia	**6.1**	**5.02**	**-2.07**

Sources: Rancangan Akhir Rencana Kerja Pemerintah Tahun (2013); Bappenas (2012).

Regional development in Indonesian Wallacea

Indonesia has the 16th largest economy of any country in the world, and, at one time, was aiming to be in the top 10 by the end of the current long-term plan, in 2025. While this is now unlikely, the economy grew at around 5 percent per year until the Covid-19 pandemic in mid-2020. In an attempt to achieve ambitious growth targets and to re-start the economy after the pandemic, the government under President Widodo's second term has prioritized improving the ease of doing business, encouraging investment and improving infrastructure. Thus, the National Medium Term Development Plan 2020-2024 emphasizes infrastructure development, especially connectivity, as the first of its five priorities. The others are human resource development, increased investment, bureaucratic reform and increased efficiency in the use of the state budget. The post-Covid recovery plan re-emphasizes this focus on investment and economic growth.

6.1.3 Main economic sectors

Mining, oil and gas sector

Indonesia is among the top 10 producers in the world of gold, copper, nickel and tin. Mining is a significant contributor to Indonesia's GDP and the major contributor to the GDP of a number of its provinces, including Nusa Tenggara Barat, Sulawesi Selatan and Maluku Utara.

Demand for nickel is growing globally, with the need for batteries for renewable energy. Indonesia is the largest nickel producer in the world, holding an estimated 25 percent of the world reserves of the metal, and producing 800,000 tons in 2019 (USGS 2020). The main production areas are Sulawesi Tengah, Sulawesi Selatan, Sulawesi Tenggara and Maluku Utara (Halmahera). Areas with abundant reserves of nickel in Sulawesi are (1) Sorowako, East Luwu Regency, Sulawesi Selatan; (2) Morowali Regency, Sulawesi Tengah; (3) Pomalaa, Kolaka Regency, Sulawesi Tenggara; and (4) Konawe Regency, Sulawesi Tenggara (Coordinating Ministry for Economic Affairs 2011). Production is dominated by government-owner Aneka Tambang, and PT Vale Indonesia.

In Sulawesi, PT Vale Indonesia operates at four locations, with a contract of work area covering a total of 118,017 ha. Its mines are close to the critically important Malili lakes complex, with a large number of highly threatened freshwater species.

Nickel ore deposits are also found in the Central and East Halmahera districts of Maluku Utara province. PT Weda Bay Nickel (now owned by Eramet and other shareholders (Mitsubishi, ANTAM and PAMCO) and potentially financed by the Agence Française de Developpement and other lenders, including the IFC) has a mining concession of about 54,000 ha located partially in the forests that form a corridor between the two sections of the Aketajawe-Lalobata National Park. The company has adopted a best-practice (World Bank IFC-based) environmental, biodiversity and social policy, including a plan for a biodiversity offsets program covering a large tract of forest and other habitats to offset residual impacts to biodiversity (Stephen Dickinson, GM Environment and Biodiversity, pers. comm. 2014).

While Weda Bay is investing time and resources in detailed social and biological surveys, and has not yet started mining operations, smaller companies in neighboring concessions are operating and have, in some cases, prompted protests from neighboring communities about marine and freshwater pollution.

The nickel industry is an important source of exports and foreign revenue for Indonesia. In 2014 the Government proposed a ban on export of raw nickel ore, in an effort to develop smelting in Indonesia, and increase the value of exports. In 2021, it was reported that three smelters were expected to be operational within a year (Reuters 2021b), and that Harita group had built a US$3.7 billion smelter on Obi island, Halmahera, to produce battery components (Daily Insights 2021).

The oil and gas industry contributed 7 percent of Indonesia's GDP in 2010 (EIA 2014) and provided US$3.4 million to state revenues in 2011 (PWC 2012). Operated primarily by international companies working under production sharing contracts, the main players in oil and gas production are Chevron, Total, ConocoPhillips, Exxon and BP, along with national company Pertamina. Oil production has declined over the last 10 years, with Indonesia becoming a net importer of oil in 2004 and suspending its membership of OPEC in 2009. At the same time, gas production has increased significantly.

Oil production in Indonesia has been concentrated in the marine basins off Sumatra and Java. Gas production is concentrated in Aceh, East Kalimantan and West Papua (the BP Tangguh facility), with a liquefied natural gas plant in each of these areas. The seas to the east of the Central Sulawesi marine corridor have also emerged as an important area for gas production (EIA 2014), and the Donggi-Senoro Liquefaction Plant is being built by Mitsubishi, Kogas, Medco and Pertamina near Luwuk in eastern Sulawesi to serve this field. The area is close to the high-priority Banggai Islands marine KBAs and the Togean-Banggai marine corridor.

Gold, copper and one of the world's largest sources of naturally occurring asphalt are also found in Sulawesi.

Forestry and forest plantation sector

Forest industries have focused on exploitation of Wallacea's natural forests through the logging license (IUPHHK-HA) system administered by the Ministry of Forestry. These

licenses are available for parts of the state forest zone classified as "production" forests. There are 10.3 million ha of production forest in Wallacea, and licenses for exploitation of natural forest (i.e., industrial logging licenses) have been issued covering 1.9 million ha in 2020, down from 2.8 million ha in 2011 (MoEF, 2020).

Production forest can also be licensed for the development of tree plantations (Hutan Tanaman Industri or HTI). The Ministry of Environment and Forestry supports the expansion of these plantations, which are primarily for fiber (acacia and eucalyptus) but also for rubber and, occasionally, sago. In 2011, only 350,000 ha, 3 percent of the production forest estate, had been licensed for this use in Wallacea. By 2020, the total area licensed for tree plantations in Wallacea had expanded by 120,414 ha, to 470,414 ha.

In addition to the licenses issued to companies, 633,305 ha of community-based forest management licenses had been issued in Wallacea by 2020, under three schemes: community forests; village forests; and community timber plantations. This is over twice the area licensed in 2011, 296,603 ha, and reflects the shift in emphasis of MoEF towards granting rights for community management.

Just under 1 percent of the current state forest zone (90,570 ha, 240 licenses) is licensed for 'leasehold forest license'. These licenses allow non-forest uses within forest areas, and are usually issued for mining or power infrastructure development.

Seventy percent of the production forest estate in Wallacea, 7.2 million ha, are without any license. Experience suggests that the parts of the forest zone without an active license are those most vulnerable to illegal exploitation; however, it also needs to be recognized that much of the state forest zone is inhabited and used by communities (and in many cases, it has been for many generations). Thus, state forest zone is not the same as forest cover, and state forest zone without any current license does not mean that there is no one using the land and resources.

There are marked differences in the proportion of the state forest zone which has been licensed between the regions (Table 40). Nusa Tenggara has only 1.1 million ha of production forest and only one logging concession, but 129,985 ha of timber plantation license. The subregion is also notable for having 72,908 ha of community forests (HKm and HTR). Maluku, by contrast, has 28 logging concession licenses covering 1.5 million ha, and 99,153 ha of HTI licensed. The region also has a large area of community forestry licenses, 209 licenses covering 218,527 ha. Sulawesi has 5.2 million ha of production forest, the largest absolute area of any subregion, but a much lower proportion is licensed for logging- 9 licenses cover 393,750 ha. Sulawesi has the largest area of timber plantation (11 licenses, 241,276 ha) and a large area of community forest management licenses (1,652 licenses covering 341,870 ha).

Oil palm plantations

Globally, it is expected that 74 million tons of palm oil will be produced in 2020, slightly down from 2019 as a result of the Covid-19 pandemic, but still reflecting the steady growth in global demand for the product for food, biofuel and other uses. Indonesia produced 48.3 million tonnes, 66 percent of the global total, in 2020. Just over half of this volume is exported, contributing between 10 percent and 15 percent of the country's exports by value. Indonesia also has a strong domestic market for palm oil, bolstered in recent years by a law that requires an increasing proportion of fuel to be sourced from biofuel.

Table 40: Area (hectares) of forest-use licenses in production forests in Indonesian Wallacea, 2020

Province	Total production forest area	Area of logging license	Area of timber plantation license	Area of village forest license	Area of community forestry license	Area of community plantation license	Area of non-forest use license	Total licensed area
Gorontalo	423,400	-	74,146	6,777	10,030	1,364	3,188	95,505
Sulawesi Barat	425,200	30,525	10,600	9,285	17,205	7,730	603	75,948
Sulawesi Selatan	636,000	-	21,430	49,757	54,358	7,966	11,722	145,233
Sulawesi Tengah	2,010,100	336,425	73,320	41,377	26,693	-	16,292	494,107
Sulawesi Tenggara	961,900	-	54,280	30,804	28,538	13,156	24,362	151,140
Sulawesi Utara	288,000	26,800	7,500	-	8,726	28,104	2,201	73,331
Maluku	2,862,900	720,634	33,245	102,522	33,438	-	832	890,671
Maluku Utara	1,712,600	782,006	65,908	52,104	11,025	19,438	20,998	951,479
Nusa Tenggara Barat	437,400	28,644	75,810	-	19,450	3,122	9,394	136,420
Nusa Tenggara Timur	536,400	-	54,175	-	47,121	3,215	978	105,489
Total	**10,333,033**	**1,925,034**	**470,414**	**292,626**	**256,584**	**84,095**	**90,570**	**3,119,323**

Source: MoEF (2020).

Just over half of Indonesia's oil palm is produced by smallholder producers, the rest from large plantations. In 2018, the total area of oil palm plantation licenses in was around 22 million ha. Despite sustainability commitments from many large companies, the Indonesian palm oil industry has been shown to have been a major contributor to fires, forest loss, peatland degradation and social conflict. As a result, Indonesian palm oil has been a focus of concern for the EU, which is a major export market for Indonesia, and in January 2018 the EU's renewable Energy Directive was amended to exclude palm oil biofuels after 2021. In response to domestic and international pressure to make the industry more sustainable and transparent, the government introduced a temporary ban on the issuance of new licenses for oil palm in September 2018, scheduled to end in September 2021. The ban mandated local governments to review existing plantation licenses.

Only a relatively small proportion of Indonesia's oil palm (0.6 million ha) is grown in Wallacea, in Sulawesi and Maluku. However, the area licensed for oil palm has grown by nearly 250 percent in the 10 years from 2008 and 2018.

Local communities that are losing their land to oil palm plantations have become increasingly critical as they link the expansion of these plantations with flooding, water pollution and water shortages. For example, in Gorontalo province, three villages in the Popaya subdistrict are blaming water shortages on the neighboring palm oil plantation. Conflicts between communities and palm oil plantation will continue as competition for land increases.

Cocoa

Indonesia is among the world's top six cocoa producers, producing less than Cote d'Ivoire, Ghana and Ecuador, and similar levels to Nigeria and Cameroon. The commodity delivers the fourth largest foreign exchange earnings in the plantation sector after palm oil, rubber and coconut. However, production has declined over the last five years, and in 2020 it was estimated the country would produce 200,000 tonnes, nearly a third less than in 2016-2017 (290,000 tons) (Jakarta Post 2020).

Growing of cocoa in Indonesia is dominated by smallholder farmers managing less than 2 ha of land, often with a low density of cocoa plants mixed with other crops. They lack access to information, capital and inputs, and this has left them vulnerable to fluctuations in weather, pests and diseases, and the changes in the global markets. There is some evidence that they are increasingly turning to rubber or oil palm as alternative crops. As a result, the area of cocoa production in Indonesia has fallen by almost 10 percent in five years.

Whereas Wallacea does not play a very large role in palm oil production, the region dominates the cocoa sector in Indonesia (Table 41). Sixty-seven percent of Indonesia's cocoa farms, just over one million ha, are in Wallacea, almost all in Sulawesi, most of it in the two provinces of Sulawesi Tengah and Sulawesi Tenggara. The area of cocoa farms has followed the national trend, however, with declines in eight of the ten provinces in Wallacea between 2017 and 2021.

The market for cocoa is growing, especially in Asia, and Indonesia has made efforts to develop new plantations and downstream industry to increase its share of the market. However, several years of investment in the industry by Government have failed to reverse the decline in production. Private sector and donor-supported projects are still attempting to address the issue (e.g. the Rainforest Alliance TRACTION project). In another example, two

of the biggest buyers, Olam and Mondelez, have announced a joint sustainable cocoa project on Seram, which will contribute to rehabilitating over 3,000 ha of degraded land. The focus on sustainable cocoa is part of efforts to improve income from the commodity. UTZ/Rainforest alliance now have 31 certified cocoa producer groups and 10 certified supply chain actors in Indonesia.

Table 41: Area (hectares) of cocoa farms in Wallacea, 2017 and 2021

Province	2017 area (ha)	2021 area (ha)	Percentage change
Gorontalo	15,162	14,272	- 5.87
Sulawesi Barat	145,787	139,974	- 3.99
Sulawesi Selatan	237,712	196,378	- 17.39
Sulawesi Tengah	285,788	272,079	- 4.80
Sulawesi Tenggara	254,957	239,043	- 6.24
Sulawesi Utara	16,717	16,681	- 0.22
Maluku	28,160	24,989	- 11.26
Maluku Utara	32,437	23,828	- 26.54
Nusa Tenggara Barat	7,657	7,727	+ 0.91
Nusa Tenggara Timur	57,838	66,077	+ 14.24
Total Wallacea	**1,082,215**	**1,001,048**	**- 7.50**
Total Indonesia	**1,658,421**	**1,497,467**	**- 9.71**

Source: Directorate-General Estate Crops, Ministry of Agriculture (2021).

Agriculture and fisheries

Agriculture is still the dominant sector throughout Wallacea. It is the largest contributor to Sulawesi's GRDP (30 percent) and absorbs about 50 percent of the total workforce. Sulawesi is the third largest food producing region in Indonesia, accounting for 10 percent of national rice production and 15 percent of national corn production.

The government considers fisheries to be a subsector of agriculture, and it is difficult to extract data from government reports, especially when the categories reported on differ from year to year. Currently, fisheries contributes approximately 22 percent of the total GRDP of food agriculture subsector (70 percent catch fisheries and 30 percent aquaculture).

Nationally, 3.7 million people work as subsistence fishermen, bringing in 4.4 million tons of fish catch (FAO 2010); however, the FAO also recognized that the overall catch was significantly under-reported, so the figures might be misleading. Specific figures for Wallacea are not available, but it is hypothesized that while fisheries around Java and Sumatra are being utilized at or beyond their maximum sustainable yield, the fisheries in the less densely populated eastern Indonesia are not yet fully exploited (Resosudarmo *et al.* 2000, Dutton 2004, Dahuri 2013).

As a subsector of agriculture, fisheries contributes just over half of agriculture's contribution to the GDP (16 percent) in Maluku (Bappenas 2012). Data specifically on fish catch (as opposed to farmed fish) shows that Maluku province has the largest rate of increase in catch fisheries production in Indonesia, and the region has been designated a National Fish Reserve. Development of fisheries in Maluku Utara will be the subject of a major investment in the Morotai Mega Minapolitan, a plan to create zones for a fishery port, processing

industries, offices and warehouses, marine tourism, residential housing, and conservation and supporting services centered on the island of Morotai, northern Halmahera. At present, according to the Ministry of Maritime Affairs and Fisheries (KKP), the fishery potential of Maluku is in the Banda Sea, the Seram Sea and the Arafura Sea. The three potential sites are known as the "golden fishing ground." There are plans for fishing port development in Kendari, Sulawesi Tenggara, to service deep-sea fishing in the Arafura Sea.

Although the fishing reserves are quite abundant, problems related to stock depletion due to overfishing in some areas of Wallacea are starting to emerge and are threatening the sustainability of this resource. There have been reports of overexploitation of demersal fish and shrimp fisheries in Sulawesi Selatan (Glaeser and Glaser 2010) and large pelagic fish in Sulawesi Utara (Tulungen 2009). Even more worrying are the widespread unsustainable practices, such as destructive fishing using bombs or poison, and the clear-felling of mangrove forests for conversion of the habitat into industrial uses (Idrus 2009).

Aquaculture (the farming of fish and other freshwater or marine products such as seaweed and shellfish) is an increasingly important component of Indonesia's fisheries. Some areas in Wallacea, such as in Sulawesi, have a long history of aquaculture, while the industry is only just starting to expand in Nusa Tenggara Timur and Maluku, especially the remote islands of Maluku. Tiger shrimp and milkfish are two main important cultivated species in the region. The milkfish is mainly for domestic consumption, whereas shrimp is for export markets. In addition, seaweed cultivation has become increasingly important, and Sulawesi Selatan is now the largest seaweed producer nationally, and Indonesia the world's second largest producer. Other species that are commonly cultivated include pearl oyster, crabs, tilapia, mullet and local carp. Recently, there have been efforts to cultivate highly valued species, such as barramundi, siganidae fish, sea horses and certain types of high-priced corals. Cultiatvation of these products, however, is still limited to research facilities owned by government and private companies.

Tourism

In 2017, tourism contributed about US$37 billion to the Indonesian economy, making up 4.1 percent of GDP as well as being a significant source of foreign exchange. The sector supported over 12 million jobs, more than 10 percent of all employment. There were approximately 15.8 million visitors to Indonesia in 2018, the majority from China, followed by Singapore, Malaysia and Australia. Domestic tourism was also significant, with an estimated 303 million trips in 2018 (OECD 2020).

Half of all foreign visitors to Indonesia go to Bali, with most others going to Java and North Sumatra. Situated on the edge of Wallacea, tour companies have already started to encourage tourists to venture beyond Bali to experience the attractions of Nusa Tenggara Barat, Nusa Tenggara Timur, Sulawesi Utara and Maluku Utara, and the local governments are increasingly making efforts to manage and promote tourism facilities. International flights now provide direct access to Makassar, Manado, Kupang and Lombok.

The government has set ambitious targets for the growth of the tourism sector as part of its goal of diversifying and expanding the economy. To do this, 10 areas including four in Wallacea have been identified as centres for the expansion of tourism. Those in Wallacea are Mandalika (Lombok, Nusa Tenggara Barat), Labuan Bajo (Flores/Komodo, Nusa Tenggara Timur), Morotai (Maluku Utara) and Wakatobi National Park (Sulawesi Tenggara). Mandalika and Morotai have been given special economic zone status, and the

developments at Morotai are part of a larger programme of economic development that include improved facilities for the fishing industry. All of these areas except Mandalika include or are close to KBAs, and all are areas where nature-based tourism is a main attraction. The risks of damage from tourism development are significant, however, and include direct damage to ecosystems from infrastructure development, pollution, and rapid growth in demand for energy, building materials, freshwater, and waste disposal.

Tourism is driven by interest in culture (60 percent) and nature (35 percent) (Ollivaud and Haxton 2019), with about a third of nature-based tourism focused on marine resources. It therefore has the potential to be an important incentive for the conservation. There are many local examples (Komodo in Flores; Tangkoko in Sulawesi; Manusela National Park in Seram) where local people have successfully tapped into tourists' interest in and need for accommodation, transport, guiding and other services. The risk of negative impacts on ecosystems is also significant, however, and includes direct damage and disturbance, as well as pressures from increased water and energy use, and waste disposal.

6.2 Timor-Leste

[Note to readers: the text for Timor-Leste is abridged and modestly updated from the 2014 ecosystem profile. Readers are directed to the 2014 profile for further background. This section can be further elaborated as necessary at the time of expected investment in the country.]

Timor-Leste accounts for 4 percent of the population of Wallacea, with an economic growth rate of 1.6 percent in 2019, and poverty levels of 28 percent, the country faces different social and developmental challenges from much of Indonesian Wallacea.

6.2.1 Social and demographic context

Timor-Leste is a small country with a complex history that is still emerging from the impact of 450 years of Portuguese colonialism and 24 years of Indonesian occupation. After voting overwhelmingly for an end to Indonesian occupation on Aug. 30, 1999, Timor-Leste gained independence on May 20, 2002. In the process of Indonesian withdrawal, however, more than 70 percent of the built infrastructure was destroyed (World Bank 1999). Governance structures, education and health services collapsed almost entirely, and the country was left with significant social, economic and political challenges. In the ensuing refugee crisis, an estimated 250,000 people were displaced (CAVR 2005).

In the aftermath of political instability and internal violence commonly referred to as "the crisis," in 2006, Timor-Leste stabilized. Responsibility for policing and security has been handed back from the U.N. Mission in Timor-Leste (UNMIT) to the Timor-Leste state, and peaceful democratic elections for president and parliament were held in 2012, 2017 and 2018.

Timor-Leste's ranking in the Human Development Index moved from 120 in 2010 to 142 in 2023, ranking as medium-developed country.

In 2019 the World Bank estimated the population of Timor-Leste at 1,318,442 people; 31.3 percent of the population lives in urban areas, with 68.7 percent living in rural areas

and 36.8 percent under 15 years of age. The current fertility rate for Timor-Leste is 3.9 births per woman, which is the highest in Southeast Asia.

The population density of 85.3 people per square kilometer in Timor-Leste is significantly lower than areas such as Nusa Tenggara Barat, Sulawesi Utara and Sulawesi Selatan, but higher than other areas within the Wallacea area such as Maluku and Maluku Utara. The population growth rate of 1.9 reflects the average of the areas within the hotspot, although it is higher than the Indonesian average.

The 2013 Labor Force Survey, still the most recent in 2021, shows an overall unemployment rate of 11 percent for 2013 (6.9 percent in urban areas and 3.1 percent in rural areas); however, the survey also reveals that 72 percent of the people in employment (some 178,900) are considered in vulnerable employment. Furthermore, more than a half-million people are considered to fall within the inactive category, whether by working at home or enrolled in education and training programs. The labor force participation of young people in Dili is particularly low by regional standards.

More than 68 percent of the population lives in rural areas, with 74 percent depending on agriculture for their livelihoods. The average rural family in Timor-Leste is typically engaged in rain-fed, subsistence agriculture as their primary livelihood activity — mostly using labor intensive, low-input, traditional slash-and-burn/shifting agriculture techniques.

The 2015 Census shows that 79.6 percent of households are involved in crop production including: maize (77 percent), cassava (71 percent), fruit (55 percent), coconut (56 percent), vegetables (58 percent), coffee (42 percent), and rice (39 percent). More than 87 percent of households are involved in raising livestock.

The Timor-Leste Survey of Living Standards estimated poverty at 36.6 percent in 2001 and 49.9 percent in 2007. Subsequent datasets and analysis concur that almost half of the population live in poverty. Poverty is greater in rural areas than urban areas.

According to the 2010 Demographic and Health Survey, 46 percent of children under five were stunted, and 23 percent were severely stunted; 24 percent of children under five were wasted and 10 percent were severely wasted. While, according to data from the 2010 national census, in rural areas 43 percent of households did not have access to an improved water source water, and 74 percent of households did not have access to improved sanitation.

Timor-Leste is an ethnically and linguistically complex society. There are 32 recognized local mother tongues spoken in Timor-Leste. The major local language groups include Mambai, Makasai, Tetum, Kemak, Baikeno, Bunak, Tokodede Fataluku, among others. There are two official languages, Portuguese (spoken by only 25 percent of the population) and Tetum (spoken by almost 56 percent of the population). In addition, the constitution designates English and Bahasa Indonesia as "working languages."

Timor-Leste is a predominantly Catholic country. According to the 2015 census, 97.6 percent of the population is Catholic, 1.96 percent is Protestant or Evangelical, 0.24 percent is Muslim, and 0.23 percent practices some other or no religion. Local traditions and customs are held hand-in-hand with Catholic beliefs, and in most areas, are seen as more powerful and important than Catholic traditions.

Timor-Leste is a nation defined by deep-rooted traditional modes of authority that were relatively undiminished by years of Portuguese colonial rule. Lisan or adat relates to the traditional or customary norms and relationships that shape all interactions at the community level. Relationship to the ancestors and to the land are of the utmost importance to local communities and family structures.

Lisan is used as a first port of call for almost all community level decisions or conflict resolutions. Understanding and working with these traditional structures is crucial to the success of almost all development outcomes.

Across Timor-Leste there are diverse mechanisms for resolving conflict and in particular for managing natural resources. One of the most well-known mechanisms that has become popular at the national level and among civil society is that of Tara Bandu. *Tara bandu* is a Tetum phrase meaning "hanging prohibition" and ceremony, but relatively similar mechanisms exist across the country in other linguistic groups with different names (Lobu and Kerok).

Tara Bandu has the potential to regulate both social daily matters and the relationship between humans and the environment. In fact, the customary law of Tara Bandu is a major tool for conflict prevention and resolution at the local community level, for management of natural resources (Ministry of Economy and Development 2012).

In its simplest form, *tara bandu* is used to prohibit certain unsustainable practices, such as cutting trees, hunting, fishing and harvesting certain crops at certain times. More recently, Tara bandu has been used to regulate a prolific list of community issues including theft, property destruction, gang violence, domestic violence, adultery and many others.

6.2.2 Economic context

According to government statistics, Timor-Leste has experienced double-digit economic growth and huge economic improvements through the early 2000s. Throughout the 2010s Timor Leste saw significant declines in GDP growth with a low of -4.1 percent in 2017, and then rebounding in 2019 to 18.7 percent. The government has shown commitment to economic transparency initiatives and is fully compliant with the Extractive Industries Transparency Initiative (EITI). It is also seen as a global leader on issues facing fragile states through leadership of the G7+ platform for engagement in fragile states.

Nonetheless, Timor-Leste remains the second most oil-dependent economy in the world (after South Sudan), and many donors and civil society groups are concerned with the lack of development in the non-oil economy. Eighty percent of the GDP comes from oil and gas, and the sector provides 90 percent of Timor-Leste's state revenues. Several years of aid agency handouts to communities, perpetuated now by government assistance funded by oil revenues, has undermined community self-reliance and enterprise, an issue faced by CSOs trying to facilitate participatory processes with communities. In 2011, non-oil GDP was only US$1.1 billion, and approximately half of that came from state spending, which is itself 94 percent from petroleum revenue. In 2012, Timor-Leste imported US$670 million worth of goods and exported US$31 million, mostly coffee.

There have been significant improvements in the 2014 state budget with a smaller overall budget and increased spending on health and education; however, 40 percent of the budget

will be spent on infrastructure and large amounts of funding are allocated for oil- and gas-related mega projects. Civil society groups remain particularly worried about the sustainability of current spending.

Petroleum fund
Income from the petroleum sector is channeled through the Timor-Leste Petroleum Fund, which was established in 2004 to "contribute to the wise management of the petroleum resources for the benefit of both current and future generations". The government has continuously withdrawn amounts far above the estimated sustainable income (ESI) from the Petroleum Fund. The 2020 state budget of US$1.497 billion was more than double the ESI. The 2021 state budget is similarly significantly larger than ESI, which is projected to be US$1.378 billion for this year, and expected annual withdrawals to exceed US$2.1 billion in 2022 and 2023.

La'o Hamutuk projections suggest that, with current spending and no change in policy, the Petroleum Fund will extend only to 2024, forcing 96 percent austerity after 2026. Even the most optimistic scenario, assuming significant policy change, predicts that the Petroleum Fund might last until 2037 at the latest.

Coffee
Coffee makes up 95 percent of all Timor-Leste's non-oil exports. Exporting more than 12,000 tons of coffee every year, Timor-Leste produces only 0.2 percent of the global supply but has a niche market in organic coffee. It is estimated that more than 52,000 ha of land are used for coffee cultivation, mainly in the highland districts of Ermera, Manufahi, Ainaro, Aileu, Bobonao and Liquica. Coffee is primarily grown by small holders cultivating 1 or 2 ha, and it is estimated that significant work will need to be done in upgrading plantations, many of which are made up of old unproductive trees. The Strategic Development Plan aims to double coffee production by 2030, having rehabilitated 40,000 ha of coffee plantations.

Agriculture
Agriculture comprises 30 percent of non-oil GDP. More than 68 percent of the population lives in rural areas, with 75 percent depending on agriculture for their livelihoods. The average rural family in Timor-Leste is typically engaged in rain-fed, subsistence agriculture as their primary livelihood activity, mostly using labor-intensive, low-input, traditional slash-and-burn/shifting agriculture techniques.

The World Bank Country Strategy Paper noted that "agriculture remains an important buffer that absorbs excess labor, albeit with low value-added and salaries" (World Bank 2013).

Aside from subsistence level crops, other crops that are grown in Timor-Leste are generally grown in small quantities and sold unprocessed in the domestic market. Coconut and candlenut are seen as crops that have particular potential for development. The Strategic Development Plan also highlights the need to develop other high-value niche crops for export, such as cocoa, black pepper, cashews, hazelnut, ginger and cloves.

More than 80 percent of households raise livestock of various kinds. Animals are generally let loose to roam, and there is limited knowledge of herd management and health needs.

6.3 Conclusion

The Wallacea Hotspot, whether in Indonesia or Timor-Leste, is now the focus of economic development efforts by government. Development in the region remains very uneven, with rapid development and a growing consumer class in expanding cities such as Makassar, Manado and Mataram, while significant numbers of communities remain poor and isolated, especially on smaller islands. Poverty rates are declining in the region, but they still remain stubbornly high in a number of provinces. Health and education are improving but still lag behind other regions of the country.

Resource extraction is being promoted by both countries to drive economic growth. In a region where the main economic sectors and most livelihoods depend directly on natural resource use, the economic and social rationale for sustaining healthy and productive ecosystem should be a powerful influence on development decisions. Achieving this requires effective policies and institutions to regulate and manage exploitation, however, and this is the subject of the next chapter.

7. POLICY CONTEXT

This chapter presents a review of the main environment-related national, regional and global policies and agreements that are being applied in the Wallacea Hotspot. It discusses how government development strategies may hinder or benefit biodiversity conservation in Wallacea. As shown in Chapter 6, the economy of Wallacea is going through a period of growth, facilitated by investor-friendly strategies, intensification of natural resource exploitation and growing consumer demand. This trend presents significant risks but also opportunities for conservation in the hotspot. The policy and regulatory framework is a key factor determining how the interaction between economic development and conservation plays out.

7.1. Indonesia

7.1.1 General overview

Indonesia's political situation changed in the era of President Joko Widodo, from 2014 to 2024. In that era, the development agenda was called *Nawa Cita* ("nine goals") and was embodied in the National Long-Term Development Plan (Rencana Pembangunan Jangka Panjang Nasional/RPJPN) for 2005-2025.

The first period of *Nawa Cita* consisted of nine goals, namely: (1) Bringing back the state to protect the entire nation and provide a sense of security to all citizens; (2) Building clean, effective, democratic and reliable governance; (3) Building Indonesia from the periphery by strengthening regions and villages within the framework of a unitary state;
(4) Strengthening the state's presence in system reform and law enforcement that is corruption-free, dignified and trustworthy; (5) Improving the quality of life of people and Indonesian society; (6) Increasing people's productivity and competitiveness in the international market; (7) Realizing economic independence by driving strategic sectors of the domestic economy; (8) Revolutionizing the character of the nation; and
(9) Strengthening diversity and strengthening Indonesia's social restoration. Overall, the implementation of *Nawa Cita* was carried out with a funding, regulatory, institutional and evaluation framework approach.

Following the April 2019 presidential elections, President Widodo was returned for a second term. The second *Nawa Cita* period (2020-2024), claimed to have mainstreamed the Sustainable Development Goals (SDGs), namely: (1) Strengthening economic resilience for quality and equitable growth; (2) Developing regions to reduce inequality and ensure equity; (3) Improving quality and competitive human resources; (4) Mental revolution and cultural development; (5) Strengthening infrastructure to support economic development and basic services; (6) Building the environment, increasing disaster resilience and climate change; and (7) Strengthening political legal stability and the transformation of public services. The implementation of the *Nawa Cita* was carried out with an approach to regulation, institutional, funding, evaluation and control.

During the era of President Widodo, various laws and regulations related to natural resource management, environmental management, forestry, coastal and marine were promulgated. In 2019, Indonesia faced the challenge of Covid-19. This situation then resulted in slowing development. Indonesia introduced a nationwide lockdown on 15 March 2020. The entire

development process was interrupted, and the state financing budget was diverted to the agenda of saving the nation.

A new chapter in national politics was entered on 5 October 2020, with the passing of Law No. 11 of 2020 concerning Job Creation (familiarly called UUCK), made with an ordinance called the Omnibus Law. In accordance with the designation of the procedure for its formation, the UUCK had legal influence on 79 laws, including laws related to the governance of natural resources and the environment.

The passing of UUCK invited a lot of public reaction. The public protested not only on the substance regulated by UUCK but also on the process of making UUCK. The public reaction and protest against UUCK were then responded to by the Constitutional Court. After considering, reviewing, and observing the public's aspirations, the Constitutional Court issued a decision, requiring improvements need to be made through replacement of UUCK. After one year of the Constitutional Court's decision, on 30 December 2022, President Jokowi issued a Government Regulation in Lieu of Law Number 2 of 2022 concerning Job Creation. There are at least 15 laws affected by UUCK which are closely related to the governance of natural resources and the environment.

Natural resources and environmental policies in Indonesia

After the issuance of Government Regulation in Lieu of Law Number 2 of 2022, which has repealed Law Number 11 of 2020 concerning Job Creation, in fact the regulations issued as a result of the UUCK are still declared valid. Thus, changes to 15 laws and regulations that are closely related to the governance of natural resources and the environment remains in effect. The laws and regulations on Natural Resources and Environmental Management that are currently in force in Indonesia can be seen in Table 42.

Table 42: Laws and regulations on natural resources and environmental management

Laws and Regulations	Role
The Constitution of the Republic of Indonesia of 1945	Article 33(3), states that "the land and the waters as well as the natural riches therein are to be controlled by the state to be exploited for the greatest benefit of the people."
Decree of the Peoples Consultative Assembly IX/MPR/2001 on Agrarian	Recognizes that the laws relating to the management of agrarian issues and natural resources are overlapping and contradictory;
Government Regulation in Lieu of Law Number 2/2022 concerning Job Creation	It is intended to summarize 79 laws and regulations (15 of them are related to natural resource management and the environment) with the aim of providing convenience for the growth of the investment climate, absorption of labor for the welfare of the Indonesian people.
Law Number 5/1960 Concerning Basic Agrarian Law (UUPA)	Customary (*adat*) rights are recognized under the law insofar as they do not conflict with the national interest.
Law Number 5/1990 on Conservation of Biodiversity Natural Resources and Ecosystems	Regulating the protection of biodiversity and ecosystems.
Law Number 25/2004 Concerning National Development Planning System	To ensure that development activities run effectively, efficiently and purposefully.
Law Number 26/2007 concerning Spatial Planning	Governs zoning and spatial planning including coastal areas.

Laws and Regulations	Role
Law Number 27/2007 concerning the Management of Coastal Areas and Small Islands as amended by Law Number 1/2014 concerning Amendments to Law Number 27/2007 concerning Management of Coastal Areas and Small Islands	Governs the management of coastal areas and small islands.
Law Number 32/2014 concerning Marine Affairs	Regulating natural resources in the marine-coastal area as the capital of national development. Indonesia from the point of view of strategic position and value of various aspects of life that include politics, economy, socio-culture, defense, and security.
Law Number 32/2009 concerning Environmental Protection and Management	Regulating matters regarding management, environmental protection from the impact of environmental damage and to ensure the right of Indonesian citizens to obtain good and healthy environmental quality and ecosystems.
Law Number 31/2004 concerning Fisheries as last amended by Law Number 45/2009 concerning Amendments to Law Number 31/2004 concerning Fisheries	Governs fisheries resources.
Law Number 41/1999 concerning Forestry	State control over forests is reasserted. Customary forests are considered part of the state forest area
Law Number 4/2009 concerning Mineral and Coal Mining	Regulates matters related to mineral and coal mines, including those related to mining sites in forest and marine areas.
Law Number 23/2014 concerning Regional Government as last amended by Law Number 9 of 2015.	Regulates the fiscal and legal relationship between central and local governments. Districts retain control over environmental matters, and authority to manage marine resources up to 4 nautical miles (districts). Provinces coordinate inter-district issues and control marine resources from 4 to 12 nautical miles (provinces).
Presidential Regulation Number 98 of 2021 concerning the Implementation of the Economic Value of Carbon for the Achievement of Nationally Established Contribution Targets and Control of Greenhouse Gas Emissions in National Development	Aims to deliver the presidential commitment on emissions reductions; establishes targets for emissions reductions from various sectors including land use/forestry; mandates the preparation of local emissions reductions strategies
Presidential Regulation Number 111/2022 concerning the Implementation of the Achievement of the Sustainable Development Goals	Aims as a policy direction for implementing the achievement of SDGs

To provide policy directions of a special case and aimed to the internal State Institutions, the President may issue instructions. One of the presidential instructions is Presidential Instruction Number 1/2023 on mainstreaming biodiversity conservation in Sustainable Development. This instruction is a directive of the President to Ministers and Heads of Institutions within the state government to mainstream biodiversity conservation to achieve balance and integration in sustainable development.

Indonesia also has policies that regulate matters that ratify the results of treaties, global conventions. One of them is Presidential Decree Number 43 of 1978 concerning ratification of the Convention on International Trade in Endangered Species of Wild Fauna and Flora. As well as Presidential Decree of the Republic of Indonesia Number 1 of 1987 concerning ratification of the 1979 Amendments to the Convention on International Trade in Endangered Species of Wild Fauna and Flora, 1973.

Institutions for implementation of natural resource and biodiversity protection and conservation

The management of natural resources, including biodiversity and natural resources and ecosystems both on land and in the sea, is regulated by the state. Arrangements are made in accordance with the authority between the central government and local governments. Natural and biological resources and ecosystems in Indonesia are generally divided into two, namely land or terrestrial, namely and coastal and marine areas. Regulation in forest areas is carried out by the government through the Ministry of Environment and Forestry, which mandates technical implementation through Technical Implementation Units (Unit Pelaksana Teknis/UPT) at the regional or provincial level. Likewise, the regulation and management of natural resources and ecosystems on the coast and sea is carried out by the Ministry of Marine Affairs and Fisheries (Kementerian Kelautan dan Perikanan/KKP).

The two ministries have an important role in the protection, preservation and management of natural and biodiversity resources and ecosystems (as part of natural resources). Local governments also have similar authority, in accordance with the laws and regulations governing the authority of the government and the regions. Currently, local governments are also involved in conserving biodiversity in 161 regions spread throughout Indonesia. There are 34 governors, 416 regents and 98 mayors that play a role in natural resource management.

The role of the Ministry of Environment and Forestry as referred to in Presidential Instruction No. 1 of 2023 concerning Mainstreaming Biodiversity Conservation is:

1. Develop strategies for planning, managing, protecting, preserving and utilizing biodiversity and its control.
2. Controlling development and conservation with biodiversity indicators
3. Increase biodiversity conservation efforts based on the principles of prudence and sustainability including the use of bioprospecting.
4. Improve the guidance and guides local governments including in the preparation of regional biodiversity profiles, and
5. Supporting the working steps of implementing international conventions in the field of biodiversity

To carry out those duties, functions, and roles, the Ministry of Environment and Forestry is focused on 30 conservation area management units. The Ministry of Marine Affairs and Fisheries also has a similar role, with the focus referred to as follows:

1. Increase efforts to manage aquatic biodiversity at the genetic, species and ecosystem levels in the marine and fisheries sector, especially for endangered fish species, and

2. Governing and developing marine and fisheries sector by guiding the elements of spreading the biodiversity of fishery resources in accordance with the provisions of laws and regulations.

In terms of carrying out the role of biodiversity conservation, the Ministry of Marine Affairs and Fisheries also has a role in establishing conservation areas. Currently, the Ministry of Marine Affairs and Fisheries manages 10 conservation areas in Indonesia.

Overall, the development strategy in Indonesia falls under the authority of the Ministry of National Planning (BAPPENAS), whose functions include:

1. Coordinating, formulating and synchronizing the formulation, determination and implementation of biodiversity management planning and strategies in long-term, medium-term and annual national planning.
2. Controlling, monitoring, evaluating and mainstreaming biodiversity management in national planning

The strategic role of BAPPENAS currently includes leading the development of Indonesia's National Biodiversity Strategy and Action Plan. The strategy formulated by BAPPENAS is sourced from information provided by all ministries, including in terms of management, protection of natural resources, biodiversity and ecosystems. BAPPENAS is also the lead agency for the achievement of the SDGs. Mainstreaming the achievement of SDGs in development is also attached to the duties and functions of all ministries in Indonesia.

In 2021, Indonesia formulated an ambitious strategy for achieving SDGs related to climate change known as the FOLU Net Sink towards 2030. In its implementation, the role of these achievements is led by the Ministry of Environment and Forestry. However, the distribution of the roles of all ministries and institutions is carried out by BAPPENAS.

BAPPENAS is also the lead for matters related to Indonesia's global commitment to the Convention on Biological Diversity (CBD).

The distribution of roles up to the local government level also refers to Law No. 23 of 2014 concerning Regional Government. The law regulates the authority of local governments, so that in the implementation of development strategies also consider regional needs, especially those related to the authority to manage natural resources including biodiversity in accordance with regional needs.

At the end of 2022, with the existence of a Government Regulation in Lieu of Law Number 2 of 2022, the entire distribution of duties, roles and authorities for all affairs had changed. All ministries and agencies, local governments and villages must adjust the new arrangements.

Table 43: National, provincial and district government agencies active in biodiversity conservation in Indonesian Wallacea

National Government	Provincial/District	Role / Responsibility
BAPPENAS	Provincial Planning Agency (BAPPEDA)	Develop sustainable development strategies including mainstreaming the protection and preservation of biodiversity into national development strategies. Become the focal point for achieving the SDGs
Ministry of Maritime Affairs and Investment	Provincial Government Provincial Planning Agency (BAPPEDA)	Synchronize the formulation of presidential priority programs including monitoring and building the Environment, Improving Disaster Resilience, and Climate Change, restoring critical watersheds, supporting indigenous peoples.
Ministry of Environment and Forestry	Provincial Environment and Forestry Agency[1] UPT at the regional level (National parks, Water Catchment Management Agencies or BPDAS, and other UPTs in accordance with conservation functions)	Organize government affairs in the field of environment and forestry. Formulate, determine and implement policies in the field of forest area strengthening and sustainable environmental management, coordination and synchronization of policy implementation.
Ministry of Marine and Fishery Affair	Provincial Marine and Fishery Agency	Formulate, determine and implement policies in the marine and fisheries sector.
Ministry of Home Affairs	Provincial, district and cities	Facilitate mainstreaming of biodiversity into the planning, implementation and budgeting of regional dismantling. Conduct coaching and advocacy for the Regional Policy on Mainstreaming preservation of biodiversity. Coordinate the implementation of preservation of biodiversity in sustainble development by provincial and regional regions districts/cities.
Ministry of Agriculture	Working closely with Provincial Environment and Forestry Agency	Build strategies and plan for sector and regional development, by guiding elements of biodiversity distribution, including conservation areas, essential ecosystem areas, habitats and distribution areas of flora and fauna, as well as Ecologically Important and High-Value Areas.

[1] In the era of President Widodo, the Ministry of Forestry and the Ministry of Environment were merged. In 2014, the issuance of Law No. 23 of 2014 had implications for the implementing structure of the government, the implication was that the Forestry Service at the district level was completely withdrawn to the province. Also, the implementation of forest management at the site level was assigned to the Forest Management Unit or KPH.

Land tenure
Land tenure is a legal term that refers to land ownership recognized by the state. In Indonesia, the formal process of registering land ownership rights is often interpreted as ownership rights as evidenced by the existence of a certificate of ownership, this situation has an impact on the land ownership rights of Indigenous peoples.

The nomenclature of Indigenous peoples has not been adopted by the Government of Indonesia so that, until now, it has not been used in laws and regulations. The right to land ownership of Indigenous peoples is one of the substances in the defense of Indigenous peoples' rights known as the Decision of the Constitutional Court.35 of 2012. The decision approved changes in the provisions referred to in Law 41 of 1999 concerning forestry. In Annotation MK 35 of 2012 has provided space for initial recognition for Indigenous peoples, by stating that forests located in customary/Indigenous territories are not state forests.

Of no less importance, before the issuance of MK 35, Indigenous peoples in Indonesia had initiated and formulated a draft law on Indigenous peoples. The draft has been discussed since 2009 and was first included in the National Legislation Program in 2012 but, until now, it has not been approved.

The Alliance of Indigenous Peoples of the Archipelago (AMAN) and the Customary Territory Registration Agency (BRWA) carry out mapping and identification of Indigenous peoples' territories in Indonesia. In parallel, the Ministry of Environment and Forestry grants forest management rights to Indigenous peoples through social forestry, under the name Customary Forest. To obtain customary forest management rights, Indigenous peoples must first be legally recognized as a Customary Law Community (Masyarakat Hukum Adat/MHA). The process of recognition of an MHA is validated by the local government. After going through the validation and verification process, the MHA is established. Once established, it can apply for customary forest management to the Ministry of Environment and Forestry.

In terms of customary forest management, the Government of Indonesia provides management rights that are in accordance with the needs of the customary community and are managed in a manner that is in accordance with applicable customary values. Under this arrangement, customary forests are not allowed to be traded, and the collection of forest products is limited to non-timber forest products plus timber that meets the daily needs of Indigenous peoples.

As of August 2022, BRWA and AMAN had identified customary territories with a registered customary territory area category of 20.7 million ha. The registered customary territories are spread across 29 provinces and 142 regencies/cities, with a total of 1,119 maps of Indigenous territories. The Ministry of Environment and Forestry has also referred to the results of the identification carried out by AMAN and BRWA.

Spatial and land-use planning
The institution authorized to deal with spatial planning in Indonesia is the Ministry of Agrarian and Spatial Planning. This ministry is the result of the merger, in 2014, of the Directorate General of Spatial Planning in the Ministry of Public Works with the National Land Agency.

7.1.2 Overarching natural resource policies and laws

Indonesia has a mosaic of sometimes conflicting laws and regulations governing environmental management. A review by the (then) Ministry of Environment concluded that there are 12 laws governing natural resources that conflict with one another. Management of marine and coastal resources involves 14 sectors, including land, mining, transportation, tourism, forestry, agriculture, fisheries, industries, conservation, environment and spatial planning. There are approximately 22 statutes and hundreds of regulations governing those 14 sectors (Nurdiayah 2010).

The foundation for natural resource policy is the 1945 constitution, which recognizes that "the land and the waters as well as the natural riches therein are to be controlled by the state to be exploited for the greatest benefit of the people". Until the late 1990s, the focus of laws on the environment was to enable the commercial exploitation of resources. Over the last 20 years, however, there has been a shift towards recognizing the role of natural resources in local economies, and for non-extractive uses, including climate change mitigation.

The **1999 Forestry Law** remains the basis for forestry management in Indonesia, although it was due for revision after 15 years in 2004. The law has a strong focus on centralized and technocratic management of the national forest estate, and establishes the division into conservation, protection and production functions, which underpins current forest management. A draft revision of the law was included in the 2018-2019 legislative program but was not discussed. Although some 20% of the law was amended by the 2020 Job Creation law (see below), there are proposals to revise the law to take into account recent changes (such as the recognition of customary forest as a separate category of tenure), and the government's priorities for forest management, which lay greater emphasis on community engagement, sustainable economic development, climate change mitigation and multiple services from forests.

Law 32/2009 on the Management and Protection of the Environment, is the key law for environmental management outside of the forest estate, although its implementation has been amended by subsequent Laws, especially Law 23/2014 on Regional Government, and Law 11/2020 on Job Creation (see below). Important elements of the Environment Law include establishing a public right to information, requiring MoEF, Governors and District Heads to publish environmental applications and decisions, and to organize public participation, and strict liability rules for companies causing environmental damage

The **2007 Law on Spatial Planning** has an important influence on land use planning. It lays out the system for planning, including the national and local spatial plans.

The **2020 Job Creation Law** (UUCK) is broad piece of legislation, which aims to reduce bureaucracy, simplify regulation and increase the ease of doing business in Indonesia, thereby creating economic activity and jobs. The Law repeals and amends 76 previous Laws, including parts of the Labour Law, 2009 Environment Law and Spatial Planning Law. Key areas of concern for environmental issues include:

- The 'Environmental Permit', which is required as a pre-condition for issuing a Business License has been downgraded to an 'Environmental Approval'. Previously, environmental permits functioned as an umbrella for specific permissions/licenses to

exploit or pollute, and thus facilitated monitoring and control. This integrative role now appears to have been lost, weakening the value of the permit as an entry point for control of environmental damage. The downgrading from Environmental Permit to Environmental Approval also appears to remove an opportunity for legal challenge to the decision.

- Environmental Impact Assessments (EIAs) were previously scrutinized by EIA Commissions, which included representatives of affected communities and interested organizations. These commissions have now been replaced by a 'certification committee', which only has representation of government and technical experts, eliminating a critical opportunity for public scrutiny and participation.
- The Spatial Planning Law previously laid down that land-use planning should retain a minimum of 30% of land cover as forest at the level of watershed and islands. This requirement has been removed.
- The list of environmental offences in the Environment Law contained a provision for exemptions in the case of 'genuine customary practices'. This was an important clause which could, for example, allow Indigenous groups to continue with small scale shifting cultivation within forest zones. The clause has been deleted and thus exposes customary practices to criminalization.
- There are some changes to the sanctions for environmental offences, for example treating hazardous toxic waste without a permit is reduced from a criminal to a civil/administrative offence

The Job Creation Law has been controversial, both because of its contents and because of lack of transparency and consultation during its development. When it was enacted in October 2020, the negative reaction, especially from the labor and environment movements, was so strong that the MoEF issued a statement that rebutted criticism and identified positive aspects of the law, including that:

- In addition to promoting investment, the law contributes to resolving tenurial conflicts connected to the state forest zone, criminalization of communities, and the problem of plantations within the forest zone.
- The law is on the side of the community with its emphasis on restorative justice and that business licenses are not only for private sector but also for community groups. Sanctions for communities living around state forest zones are administrative, not criminal, and lead to solutions through the social forestry and land reform programs.
- There is no reversal of the EIA process, only a refinement of the existing law making it easier for business to secure licenses as long as they comply with environmental conditionalities. The purpose of integrating Environmental Approval into the business license is to shorten the bureaucracy around environmental licensing and strengthen law enforcement.
- Opportunities for community engagement in the EIA process remain, and the focus on those who are directly impacted gives greater weight to local community views.
- There are important simplifications to the processes for defining state forest areas and issuing licenses for exploitation, including for ecosystem services and other uses.

Marine and coastal management are regulated through Law 1/2014 on the management of coastal areas and small islands. This act has importance for marine tenure (see Section 7.1.11).

Another important legislative change affecting marine resources is the enactment of the Maritime Law 32/2014, which replaces Law 6/1996 concerning Indonesian Waters. The Law covers the management of Indonesian maritime resources in an integrated and sustainable manner, including: (i) defining the area of Indonesian seas; (ii) marine sector development; (iii) maritime management; (iv) marine spatial management and protection; (v) defense, security, law enforcement and safety at sea; and (vi) governance and institutions. Over the subsequent years, regulations have been issued under this law including:

- Presidential Regulation 178/2014 concerning Maritime Security Agency.
- Presidential Regulation 16/2017 concerning Indonesian Maritime Policy.
- Presidential Regulation 83/2018 concerning Marine Waste Management.
- Presidential Regulation 56/2019 concerning the National Action Plan for Integrated Management of Marine National Parks and Marine Protected Areas 2018-2025.
- Government Regulation 32/2019 concerning Marine Spatial Plan (see Section 6.16).

Marine spatial planning is particularly weak: most local governments prioritize terrestrial planning and do not have any mapping and zoning for marine areas. Many local governments do not have any capacity in marine zoning and mapping (Nurdiayah 2010).

7.1.3 Species protection legislation

Ministerial Regulation 106/2018 protects 116 plant species and 788 animal species. Twenty-five of these species are targeted for special measures under the population increase program, with the aim of achieving the 10% increase in their population by 2019, from a 2013 baseline. Targeted species in Wallacea include yellow-crested cockatoo, tarsier species, Celebes crested macaque, Sumba hornbill, hawksbill and green turtles, and Rinjani scops-owl.

7.1.4 Terrestrial protected area legislation

Protected areas in Indonesia are part of the national forest estate and are defined on the basis of Forestry Law 41/1999, with further details of their management proscribed in Government Regulation 28/2011. Protected areas are categorized into sanctuary reserve areas (*kawasan suaka alam*, KSA) and nature conservation areas (*kawasan pelestarian alam*, KPA). Sanctuary reserve areas are more strictly protected, and include strict nature reserves (*cagar alam*) and wildlife reserves (*suaka alam*). Nature conservation areas include national parks, forest parks and nature tourism parks.

Efforts to improve management effectiveness in national parks have emphasized increasing staff time in the field, through the resort-based management approach, and strategic use of limited resources for patrolling and law enforcement, combining traditional patrolling with remote sensing and reporting through the Spatial Monitoring and Reporting Tool (SMART) and the involvement of forest-edge communities in monitoring. National park management effectiveness is now measured through standardized application of the Management Effectiveness Tracking Tool (METT).

With an estimated 6,381 villages on the borders of protected areas in Indonesia, MoEF's increasing emphasis on community engagement in national parks aims to increase the effectiveness of management and to reduce conflict between management authorities and local resource users. A key approach has been the creation of 'traditional use zones' within

national parks, where resource-use activities by local people are permitted. Between 2015 and 2019, 579,208 ha of traditional use zones were created in Indonesia, allowing people from 192 villages access to land and resources in 54 national parks (MoEF, 2020).

7.1.5 Management of the forest estate outside protected areas

Eighty-one percent of Indonesia's national forest estate is outside official protected areas, but much of it is, nevertheless, important for biodiversity conservation and ecosystem services. The MoEF (e.g. MoEF 2020) now emphasizes a shift in the objectives of forest management, away from commercial timber production and towards sustainability, creation of opportunities for forest-edge communities, and management of multiple values including climate and ecosystem services and local livelihoods. Recent policy initiatives highlighted by the ministry include:

- Increased emphasis on resolving conflicts, with efforts to clarify the boundaries and legal status of forest areas, and the instigation of a mechanism to resolve conflicts between government, communities and concession holders.
- The introduction of mandatory sustainability certification (PHPL) for companies extracting timber from natural forests or timber plantations, and a chain-of-custody system (SVLK), which has been approved by the EU's FLEGT mechanism.
- The creation of a new, specialized unit for law enforcement across all areas of environmental crime.
- Improvements in the monitoring of forest resources, with the establishment of a National Forest Monitoring System, a move from three-yearly to annual forest cover statistics.

A flagship policy of the government is the moratorium on the utilization of primary forest and peatland. Initiated as a temporary ban on the issuance of new licenses in 2011, and extended in 2017, the policy became permanent through Presidential Regulation 5/2019 on the Cessation of Issuance of New Licenses in Primary Forest and Peatland. Some 66 million ha of peatlands and primary forest are included in the map of moratorium areas. There is debate about the definition of primary forest and peatland used to identify the moratorium area, and about exceptions given to companies with temporary licenses for plantation development within the areas, which should have been revoked on expiry.

7.1.6 Terrestrial biodiversity and ecosystem protection outside state forests

Indonesia is giving increasing emphasis to the protection of areas outside the formal protected areas network, which are of high value for conservation. The policy of protection of Essential Ecosystem Areas (or KEEs) was provided for by Article 24 of Government Regulation 28/2011. In recent years, KEEs have been designated to promote conservation outside state forests by national or local government, private sector and community groups. A growing number of KEEs have been identified across Indonesia, including in wetlands, mangrove, karst, wildlife corridors, high conservation value areas and 'biodiversity parks'. It has been estimated that the area with potential for designation as KEE is 104 million ha across the country as a whole (UNDP 2025a).

Wallacea has only 0.25% of Indonesia's peatlands (63,000 ha, all in Sulawesi), but this ecosystem has received particular attention from policymakers because of its role in fire, transboundary haze and climate related issues. A regulation on the management of

peatlands, emphasizing management of peatland domes as hydrological units, was issued in 2014 and amended in 2016. A National Peatland and Ecosystem Management Plan was issued in June 2020.

7.1.7 Land tenure and social forestry

The Ministry of Environment and Forestry has jurisdiction over 64 percent of Indonesia's land mass or more than 120 million ha, referred to as the state forest zone. This amounts to some 90 percent of the land area in some parts of the country (Fay and Sirait 2005). The Minister of Environment and Forestry has the authority to designate land as forest, determine the purpose and use of all forests, and regulate forest management, despite the fact that 37.2 million people live in 25,868 villages within or bordering the state forest zone (MoEF 2020). In 2011 and 2012, the ministry's monopoly over this large area was challenged through Constitutional Court decisions that supported local governments and Indigenous groups, accelerating a process of reform, which has led to increased opportunities for local communities to secure social forestry licenses, and for Indigenous groups to have their existence and land rights recognized.

Social forestry regulations allow for the issuance of forest management licenses to community groups for village forests, community forests, community plantation forests and forestry partnerships (collaboration between private sector license holders and communities). The previous national medium-term development plan (2015-2019) established a target of 12.7 million ha of social forestry licenses but, by May 2020, only 4.15 million ha had been licensed, although there was a significant acceleration towards the end of the period (MoEF, 2020). By far the most important category of social forestry is village forests, with over 1.5 million ha licensed.

Indigenous groups also have the opportunity to claim their rights to customary forests, and, once recognized, this confers permanent security of communal tenure over the area. MoEF regulations enacted in 2015 and 2019 regulate the process for Indigenous groups to claim rights over forest areas. The process is lengthy, however, requiring the group to secure recognition of its own existence before it can claim rights over forests and lands. The recognition of customary forests has been much slower than social forestry licensing, with 721 forests covering 8 million ha across Indonesia having been granted licenses (TanahKita 2025). Among these, 226 customary forests in Wallacea have been granted licenses, with the greatest concentration in Sulawesi Selatan and Sulawesi Tengah (80 and 71, respectively). There are 159 customary forest licenses in the Sulawesi bioregion as a whole and 57 in the Lesser Sundas bioregion but only 10 in the Maluku bioregion (TanahKita 2025). Given the persistence of customary community management in many areas of Wallacea, the potential for further areas to be granted customary forest status is significant. The Participatory Mapping Network (JKPP) has mapped 3.9 million ha of customary land in Indonesia, and AMAN estimated that there are 40 million ha of customary forests across the country (*Jakarta Post*, 24 June 2013), although specific figures for the Wallacea Hotspot are not available.

While ownership and control of the forest zone remains contested between national and local governments and communities, the changes have created space for progressive groups and jurisdictions to work on these issues.

7.1.8 Spatial and development planning

Indonesia has a tiered governance system, with elected representatives and technical agencies at national, provincial and district levels, and elected councils at village level. Each of the four levels prepares development plans, which are linked to budgets, and spatial plans.

The Spatial Planning Law defines the roles of the different layers of government in spatial planning and has the potential to bring about a more transparent, rational and participatory approach to the allocation of the country's land and marine resources. Spatial plans are developed for districts, provinces and nationally, and map out forest and non-forest zones, as well as the development and special protection zones. Each level of the plan is supposed to align with the broad framework in the superior ones while accommodating local aspirations. Although public participation and consultation are mandated, the results of such "bottom up" processes are often lost when plans are negotiated with commercial interests and with national agencies. To date, almost all plans have been blind to the existence of settlements in state forest reserves and to the claims of customary *adat* communities.

In the past, spatial plans were often treated as a bureaucratic document and largely ignored in the subsequent issuing of development and land-use change licenses. Although spatial plans now have stronger legal standing and there are criminal sanctions for violating a plan, enforcement remains weak. The requirement in the 2009 environment law for spatial plans to be the subject of strategic environment assessments (SEAs) has increased opportunities for participation, and scrutiny of the planning process. In practice, however, the data available to undertake SEAs is often poor, and SEA processes are not conducted with broad, authentic participation.

7.1.9 Land-use policies and programs

The current national long-term development plan covers 20 years, from 2005 to 2025, and is segmented into five-year, medium-term plans, each with different development priorities. The medium-term development plans at national and sub-national levels coincide with the terms of elected leaders and so represent their political vision and commitments. The National Medium-term Plan for 2020 to 2024 has seven development agendas, and the MoEF identifies four as of direct relevance to management of forests and environment: (1) strengthening economic resilience for quality and equitable growth; (2) developing regions to reduce inequality and ensure equal distribution of wealth; (3) improving the quality and competitiveness of human resources; and (4) environmental development and enhancing resilience in the face of unforeseen disasters and climate change.

In addition to the moratorium on new licenses in primary forest and peatland (see Section 7.1.5), the government issued Presidential Instruction 8/2018 on Postponement and Evaluation of Oil Palm Plantation Licenses and Raising of the Productivity of Oil Palm Plantations. This regulation, referred to as the 'oil palm moratorium', mandated evaluation of existing plantation licenses. However, critics of the moratorium cited legal loopholes and lack of supervision and effective sanctions for non-compliance as weaknesses leading to continued deforestation (Chain Reaction Research 2021).

7.1.10 Marine protected areas legislation

Indonesia has established a total of 411 marine protected areas (MPAs), covering 28 million ha. This is equivalent to 9 percent of the country's territorial waters. In 2018, the country met its target of 20 million ha of MPAs by 2020 (Green *et al.* 2020) and is now working towards a target of 10 percent of the exclusive economic zone, or 32.5 million ha of MPAs, by 2030 (Campbell *et al.* 2019).

Although this is a significant achievement in planning terms, many of these MPAs are not yet managed effectively. To start to address this problem, in 2012 the MMAF issued a decree (44/2012 from Directorate General of Marine, Coastal and Small islands) on the technical guidelines for evaluating and improving management effectiveness of MPAs (E-KKP3K). Furthermore, at the 2018 Our Ocean Conference in Bali, MMAF launched a strategic document to accelerate the improvement of the management of 20 million ha of MPAs (MMAF 2018). An 'MPA Vision' document is also under development, which provides a more detailed strategy (based on MMAF 2018) to improve management effectiveness and achieve 32.5 million ha of MPAs by 2030 (Coral Triangle Center 2020a).

MPAs may be established by central or local governments. More than half of the total has been established by district/municipal governments (Green *et al.* 2020). However, the implementation of the "recentralization" Law No 23/2014, starting in 2016 (see Section 7.2.1), has moved from district to provincial government the authority for managing marine resources between 0 and 12 nautical miles from the coastline, including these MPAs. This institutional shift provides provinces with authority for conservation, marine spatial planning, and other management tasks of marine resources.

MPAs established at the national level are managed by MMAF and MoEF. MMAF is responsible for 10 'National Marine Protected Areas', with four in Wallacea: Kapoposang (Sulawesi Selatan); Gili Matra (Nusa Tenggara Barat); Banda (Maluku) and Sawu (Nusa Tenggara Timur). MoEF is responsible for seven national parks that were entirely or largely created to preserve marine biodiversity, four of them in Wallacea: Bunaken; Wakatobi; Taka Bonerate; and Togean.

After years of poor coordination and confusion over the division of marine conservation areas between the MMAF and MoEF, the government issued Presidential Instruction 56/2019 on National Action Plan for the Integrated Management of National Parks and National Marine Protected Areas, 2018-2025, specifically aimed at improving the management of the 17 MPAs under the direct management of the two ministries. Through the development of an action plan, the instruction provides a framework for integrating the role of National and local government, community groups and private sector within the management of the areas. It specifically emphasizes the involvement of communities, and the need for a sustainable funding mechanism and the possibility of creation of new MPAs. Importantly, it also mandates that the Action Plan be incorporated into the National Medium-term Development Plan.

7.1.11 Marine tenure

Many traditional local management systems dealing with marine resources are known to persist in Wallacea. Among them are *Sasi* in the Maluku islands (Nikijuluw 1994), *Para* of

Sulawesi Utara (Mantjoro 1996), *Awig-awig* in Bali and Lombok and to some extent the *Ponggawa-Sawi* relationship in Sulawesi Selatan (Yusran 1998).

Until recently however, little attempt has been made to evaluate this locally practiced customary marine tenure or to integrate it into the legal framework of marine resource management. This is mainly due to a political atmosphere that did not allow for grassroots participation in decision-making, nor any room for community empowerment to grow (Yusran,1998). This is changing, however, with several areas issuing regulations that reinstate customary concepts of land and village boundaries. In addition, communities have established LMMAs, including in the Kai and Banda islands of Maluku province.

7.1.12 Decentralization, re-centralization and natural resource management

In the early 2000s, the Indonesian Government implemented a sweeping program of decentralization, with district governments becoming responsible for many aspects of government, including issuing licenses for resource use. The extent of decentralization varied across the natural resources sector, however, with forestry, mining, plantations and marine management extending different levels of authority to local governments. There were apparent contradictions between the decentralization law, and the various sectoral laws which established the basis for resource management. This led to tensions between central and local government over authority to regulate, raise revenue and to grant licenses for resource exploitation.

One of the side-effects of the tension between national and local governments is difficulty in coordination over the management of protected areas. National parks and other protected areas are under the authority of the MoEF, represented by the ministry's management units in the field. No management authority has been devolved to district governments. As a result, district governments have little incentive to contribute to the conservation of these areas and, in some cases, view their creation as a restriction on their development ambitions (Rhee *et al.* 2004). This view may be changing, with a number of national park proposals (e.g., Ganda Dewata, Mekongga in Sulawesi, and the Savu Sea in Nusa Tenggara) securing local support.

In response to these problems, central government enacted a 're-centralization' law (No 23/2014), with implementation starting in 2016. This law re-asserted the authority of the central ministries, and shifted many powers, including the implementation of social forestry programs, from districts to provinces.

In 2014, the Village Law (6/2014) re-shaped the state's relationships with local communities, providing greater opportunities for independent planning, decision making and funding at the village level. This has potentially important implications for the sustainability of conservation projects, creating the opportunity for successful interventions to be continued and expanded within the framework of the official village development plan and budget, as happened in several cases during the first phase of CEPF investment in Wallacea. Realization of these opportunities is often constrained by lack of capacity at village level, however.

7.1.13 Global and regional commitments: Indonesia

Indonesia is a signatory to various multilateral environmental agreements (Table 44).

Table 44: Indonesia's participation in global environmental agreements

Name of Agreement	Status
Convention on Biological Diversity	Ratified, 1994
Convention on International Trade in Endangered Species (CITES)	Accession, 1979
United Nations Convention to Combat Desertification	Ratified, 1998
United Nations Forum on Forests	Participates
Cartagena Protocol on Biosafety (under the CBD)	Ratified, 2004
United Nations Framework Convention on Climate Change (UNFCCC)	Ratified (Kyoto 2004, Paris 2016)
Convention on the Conservation of Migratory Species of Wild Animals	Not ratified, signatory of MOU
Ramsar Convention	Contracting party, 1992
UNESCO Man and the Biosphere (MAB) Program	Participates
UNESCO World Heritage Convention	Acceded, 1989

Convention on Biological Diversity (CBD)
This convention, effective since 1993, has 193 member countries. Its objectives are the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. It seeks to promote conservation of biological diversity in the wild, through requesting signatories to identify regions of biodiversity importance, establish a system of protected areas, restore degraded ecosystems, maintain viable populations of species in natural surroundings, and develop or maintain necessary legislation and/or other regulatory provisions for the protection of threatened species and populations.

In August 2024, Indonesia released its 2025-2045 its National Biodiversity Strategy and Action Plan (referred to variously as the NBSAP or IBSAP). Preparation of the document was led by BAPPENAS, the national development planning agency, with leading inputs from the Ministry of Forestry and Environment, Ministry of Marine Affairs, Ministry of Agriculture, and others, as well as significant contributions from civil society, including, among others, Burung Indonesia and Konservasi Indonesia. The IBSAP has 13 strategies:

1. Integrating biodiversity into national planning.
2. Enhancing protected areas.
3. Promoting sustainable resource management.
4. Valuing biodiversity.
5. Strengthening governance and capacity.
6. Mobilizing financial resources.
7. Improving monitoring and evaluation.
8. Raising public awareness.
9. Leveraging traditional knowledge.
10. Addressing drivers of loss.
11. Ensuring equitable benefit sharing.
12. Promoting research and innovation.
13. Fostering multi-stakeholder collaboration.

There are 20 national targets that align with these strategies.

Convention on International Trade in Endangered Species of Wild Fauna and Flora
The Convention on International Trade in Endangered Species of Wild Fauna and Flora is a multilateral treaty to regulate international trade in plants and animals. Indonesia became a party to CITES in 1979. MoEF and MMAF are the management authorities, setting quotas and other implementation policies for terrestrial and marine species, respectively. The Indonesian Institute for Science (Lembaga Ilmu Pengetahuan Indonesia, LIPI) is the scientific authority.

UNFCCC
Indonesia ratified the legally binding Paris Agreement in 2016. It has since submitted its statement of Nationally Determined Contributions, and conforms with the Katowice Climate package on the implementation of the Paris agreement. Further details are in Chapter 10.

Ramsar Convention
Effective since 1975, the Ramsar Convention, also known as the Convention on Wetlands of International Importance especially as waterfowl habitat, has 160 member countries. Indonesia is a contracting party with seven Ramsar sites, of which one, Rawa Aopa-Watumohai (Sulawesi Tenggara), is located in Wallacea (Table 45). Wetlands are under-represented in national protected area networks, despite being some of the most threatened ecosystems.

Biosphere Reserves
Biosphere Reserves are areas designated under UNESCO's Man and the Biosphere (MAB) Program to serve as places to test different approaches to integrated management of terrestrial, freshwater, coastal and marine resources and biodiversity. Among the 19 biosphere reserves in Indonesia are eight in Wallacea (Table 45).

World Heritage Convention
The World Heritage Convention has 187 member countries, and its aim is to identify and conserve cultural and natural monuments and sites of outstanding universal value. There is only one World Heritage Site in the hotspot, Komodo national park, with five other sites on the "tentative" list (Table 45).

Convention on the Conservation of Migratory Species of Wild Animals
The Convention on the Conservation of Migratory Species of Wild Animals (also known as CMS or the Bonn Convention) aims to conserve terrestrial, marine and avian migratory species throughout their range. Indonesia is not a party to the convention but it has signed the Indian Ocean–Southeast Asian Marine Turtle Memorandum of Understanding (IOSEA MOU). Indonesia has not signed the Dugong MOU but has engaged with the Ramsar Dugong program.

Table 45: Sites in Indonesian Wallacea designated under multilateral environmental agreements

Name of Site	Ramsar Site	Natural World Heritage Site	Biosphere Reserve
Banda Islands, Maluku		Tentative	
Bunaken Tangkoko Minahasa, Sulawesi Utara		Tentative	X
Komodo National Park, Nusa Tenggara Timur		X	X

Lore Lindu National Park, Sulawesi Tengah			X
Prehistoric Cave Sites in Maros-Pangkep, Sulawesi Selatan		Tentative	
Rawa Aopa Watumohai National Park, Sulawesi Tenggara	X		
Take Bonerate National Park, Sulawesi Selatan		Tentative	X
Wakatobi National Park, Sulawesi Tenggara		Tentative	X
Rinjani Lombok, Nusa Tenggara Barat			X
Saleh-Moyo-Tambora, Nusa Tenggara Barat			X
Togean Tojo Una-Una, Sulawesi Tengah			X

The Coral Triangle Initiative
The Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI) is a multilateral partnership of six countries formed in 2007 to address the urgent threats facing the coastal and marine resources of one of the most biologically diverse and ecologically rich regions on Earth. This region encompasses portions of two marine regions, the Indonesian-Philippines Region and the Far Southwestern Pacific Region, and six countries, Indonesia, Timor-Leste, the Philippines, Malaysia, Papua New Guinea and the Solomon Islands. The western half of the coral triangle is in Wallacea. The CTI works through five technical working groups. One of them, the marine protected areas group, aims to establish a fully functioning and effectively managed regionwide Coral Triangle Marine Protected Areas System (CTMPAS). A regional secretariat, based in Manado, Sulawesi Utara, was formed in 2015.

Association of Southeast Asian Nations
Indonesia is a member of the Association of Southeast Asian Nations (ASEAN), which aims to promote peace and stability and accelerate economic growth and social progress in Southeast Asia. Environmental issues have traditionally not been at the top of its agenda, but this appears to be changing given the growing importance of transboundary issues, such as haze from forest fires, illegal logging and wildlife trafficking. In 2010, ASEAN acknowledged the high biodiversity value of Southeast Asia and the potential impacts of rapid economic growth (ASEAN 2010). It has identified 10 priority issues of regional importance as mentioned in the ASEAN Socio-Cultural Community (ASCC Blueprint) 2009-2015 (ASEAN 2009). These include environmental education, harmonizing environmental policies, and promoting the sustainable use of coastal and marine environment, natural resources and biodiversity, and freshwater resources. These are to be enhanced through greater regional cooperation and the setting of regional standards, e.g., for water quality.

In addition to these broad policy statements, ASEAN has established three focused programs related to biodiversity conservation. The **ASEAN Wildlife Enforcement Network** (ASEAN WEN) is the world's largest wildlife law enforcement network, and involves police, customs and environment agencies of all 10 ASEAN countries (ASEAN WEN 2009). It is designed to provide training and capacity building for agencies across the region and improve collaboration and coordination among member states. The **ASEAN Heritage Parks Program** promotes the conservation of the region's most important protected areas, on the basis of nominations from member states. There are two ASEAN Heritage Parks in Wallacea: Bantimurung-Bulusaraung National Park in Sulawesi Selatan; and Wakatobi National Park in Sulawesi Tenggara. Finally, the **ASEAN Centre for Biodiversity** (ACB), formed in 2005 and based in the Philippines, is a clearing house for biodiversity data and a

center for capacity building on biodiversity conservation throughout the ASEAN community. ACB serves as the secretariat for the ASEAN Heritage Parks Program.

7.2 Timor-Leste

The information in this section is abridged and updated from the 2014 ecosystem profile. Timor-Leste does not form part of the investment niche for CEPF for the third phase of investment.

7.2.1 Natural resource policies and laws

Timor-Leste gained formal in independence from Indonesia on 20 May 2002. Timor-Leste still applies some regulations from both Indonesia as well as the United Nations for Transitional Administration in East Timor (UNTAET) but is in the process of updating and adapting these laws to the needs of the independent state. The 2002 Constitution lays the foundation for the citizens' rights to a healthy environment. Relevant articles of the include:

- Article 6: One of the fundamental objectives of the state is "to protect the environment and to preserve natural resources."
- Article 61.1: "Everyone has the right to a humane, healthy, and ecologically balanced environment and the duty to protect it and improve it for the benefit of the future generations."
- Article 61.2: "The State shall recognize the need to preserve and rationalize natural resources."
- Article 61.3: "The State should promote actions aimed at protecting the environment and safeguarding the sustainable development of the economy."
- Article 139.3: "The exploitation of the natural resources shall preserve the ecological balance and prevent destruction of ecosystems."

A key law for regulating the impact of industrial agriculture and extraction on the environment is the Environmental Licensing Law 5/2011. The law classifies projects and investments according to their expected impact on the environment and provides for project proponents to carry out environmental impact assessments. In practice, however, the law is not always effectively used in the licensing decision-making process nor is it enforced once projects have gone ahead.

Two key legal instruments related to biodiversity conservation were introduced recently. In July 2024, a bill on Conservation of Living Natural Resources and Its Ecosystems passed into law, amending Law No. 5/1990 on Conservation of Living Natural Resources and Its Ecosystems. This new piece of legislation aims to enhance conservation efforts beyond protected areas, emphasizing multi-stakeholder engagement and higher environmental standards for companies. The bill implements the Indonesian Biodiversity Strategy and Action Plan 2025-2045, which sets national targets for private sector transparency in managing biodiversity and reducing the negative biodiversity impacts of business operations.

The Protected Areas Decree Law lays down the framework for the establishment and management of terrestrial protected areas. Fifty protected areas are identified in the annex to the draft decree, identified after extensive consultation with local governments and communities. According to the Wildlife Department, many of these areas are forests that

people are protecting under customary norms and communities themselves proposed as protected areas. The decree will define a broad "forest conservation estate" of some 500,000 ha (based on the estimated areas of the majority of the proposed areas, given in the annex) but the eventual management category, objectives and any restrictions on use will be determined on a site-by-site basis in consultation with local stakeholders. Boundary demarcation will also await stakeholder discussion. Finally, the decree establishes a multistakeholder committee as a forum for decision-making on management of the protected areas. In 2016, this was further bolstered by the Decree Law No. 5 creating the National System of Protected Areas (SNAP) to establish legal regimes applicable to the creations and management of protected areas in national territory and waters.

7.2.2 Institutions for implementation of resource management policy

At the governmental level, responsibility for environmental protection and biodiversity is shared between the Ministry of Commerce, Industry and Environment, and the Ministry of Agriculture and Fisheries.

The Ministry of Commerce, Industry and Environment (MCIA) is the central government body responsible for the design, execution, coordination and evaluation of the policy defined and approved by the Council of Ministers for the areas of economic, commercial, industrial and cooperative sector activities as well as of the environment.

The Secretary of State for the Environment sits within the MCIA and is divided into a number of key directorates including: the National Directorate for the Environment; the National Directorate for International Environmental Affairs and Climate Change; and the National Directorate for Biodiversity. The Secretary of State for the Environment is responsible for: drafting environmental policy; promoting, monitoring and supporting strategies to integrate the environment into sectorial policies; carrying out strategic environmental assessment of policies, plans, programs and legislation; and coordinating processes of environmental impact assessment of projects nationwide.

The Ministry of Agriculture and Fisheries (MAF) is the central body of the government responsible for the design, implementation, coordination and evaluation of policy for the areas of agriculture, forestry, fisheries and livestock. In particular, the Ministry of Agriculture is responsible for: promoting rural development, in coordination with MCIA; managing, in coordination with MCIA, forest resources and watersheds; managing and monitoring fisheries and aquaculture; managing national parks and protected areas and ensuring the protection and conservation of nature and biodiversity; and overseeing implementation of the policy and monitoring activities detrimental to the integrity of the national fauna and flora, in collaboration with related entities.

The Secretary of State for Forestry and Nature Conservation sits within MAF and is responsible for the management of national parks and protected areas and to ensure the protection and conservation of nature and biodiversity, overseeing the implementation of policies and monitoring activities detrimental to the integrity of the fauna and flora.

Other relevant institutions include the Ministry of Tourism, Trade and Industry, the Ministry of Petroleum and Minerals, the Ministry of Justice (which has responsibility for the management of land and property), and the Ministry of Higher Education, Science and Culture (which has responsibility for the maintenance of cultural heritage).

7.2.3 Land tenure

Timor-Leste has a long and complicated history, which is never more evident than when looking at land-tenure issues. Portuguese colonialism, Indonesian occupation and UNTAET Administration have all contributed to complex layers of land ownership claims and significant levels of land conflict.

The Timor-Leste Strategic Development Plan identifies that "reform of the law relating to land tenure is of crucial importance for long-term private sector development of agriculture, particularly for commercial crops such as coffee and other potential agri-industries that need to attract investment. Timor-Leste faces three types of land-reform challenges: farm land now under customary practices; urban land in need of zoning and clear property rights; and government."

The government has passed a number of laws regulating the use and definition of land, including Law No. 13/2017, which establishes a framework for private property ownership. This somewhat controversial law establishes the legal framework related to land tenure in Timor-Leste and lays out a process for first recognition of rights.

7.2.4 Timor-Leste's commitments under global and regional agreements

Since independence, the government has ratified:

- The United Nations Framework Convention on Climate Change (UNFCCC).
- The United Nations Convention on Biological Diversity (UNCBD).
- The United Nations Convention to Combat Desertification (UNCCD).
- The Kyoto Protocol.
- The Vienna Convention.
- The Montreal Protocol.
- The Paris Agreement.

In response to global conventions, under the leadership of the Ministry of Economy and Development, the government has produced four strategies and action plans:

- The National Adaptation Plan of Action for Climate Change (NAPA), approved by the Council of Ministers in 2011.
- The National Biodiversity Strategy and Action Plan (NBSAP).
- The National Action Plan for Sustainable Land Management (SLM).
- Intended Nationally Determined Contribution (INDC) in 2017.

The Coral Triangle Initiative defines five main components: seascapes, an ecological approach for fisheries management, marine protected areas, threatened species and climate change. The main objective of this initiative is to develop and strengthen cooperation among the six countries to preserve marine and coastal resources that approximately 150 million people depend on. The major issue faced by CTI countries are illegal, unregulated and unreported fishing activities.

Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) is a multistakeholder body with representation of 11 countries in Southeast and East Asia. It promotes integrated coastal management, capacity-building and policy reform. In Timor-

Leste, PEMSEA works with the Ministry of Agriculture and Fisheries on coastal resource management, including seaweed culture and production in Liquica and Manatuto districts.

The Arafura Timor-Sea Expert Forum (ATSEF), comprising three countries (Timor-Leste, Indonesia and Australia) addresses transboundary issues of the Arafura-Timor Seas, including coastal and marine biodiversity, illegal, unregulated and unreported fishing, coastal marine tourism, land-based sources of marine pollution, climate change and sea-level rise. Part of the forum's work is to produce studies examining governance issues that consider institutional, legal and policy environments both at national and regional level.

8. CIVIL SOCIETY CONTEXT

CEPF defines civil society as the entire group of non-state actors who are involved in conservation and sustainable management of resources in the hotspot. This includes: international, national and local conservation NGOs; community development NGOs; scientific research and academic institutions; professional organizations; producer and sales associations; religious organizations; media; advocacy groups; and groups working on outreach, awareness, education, social welfare, Indigenous rights and land reform. It also includes the parts of the private sector concerned with sustainable use of natural resources.

This broad definition is pragmatic, because most CSOs cannot be neatly pigeonholed as "conservation" or "development" organizations. Many CSOs in Wallacea have multiple forms, functions and interests. Conservation NGOs frequently implement community empowerment and development activities in order to achieve their conservation goals. Conversely, CSOs working for community development may align with global environmental movements and policies. Moreover, both conservation and development CSOs may also employ advocacy activities to influence key agendas, such as land reform, in pursuit of their own objectives. The line between profit and nonprofit is similarly blurred. Private sector companies establish their own nonprofit organizations to conduct Corporate Social Responsibility (CSR) programs. These NGOs may work on many of the same issues as other CSOs, from charity to micro credit and planting trees to natural disaster relief, but their primary motivation is the use of CSR-related funding to sustain and enhance the profitability of their company.

CSOs working on environmental issues use a variety of legal structures and approaches, and may work internationally, nationally, in Wallacea or locally. They can be grouped into:

People's Organizations exist primarily to serve the interests of their members. These may be immediate economic interests (e.g., farmers, fishing associations, trade associations) or they may address long-term political aspirations of their members (e.g. Alliance of Indigenous Peoples of the Archipelago, AMAN, and the Indonesian Farmers' Union, SPI). Six people's organizations received grants in phase one: two regional branches of AMAN; two organizations representing journalists, both in Sulawesi, and two grassroots groups in Flores.

Non-governmental Organizations are non-profit organizations that exist to pursue a vision of change that is external to the organization, such as community development or environmental conservation. NGOs made up the majority of grantees in the first two phases of CEPF investment in Wallacea, and included local, national and international organizations. Religious groups form a specific sub-set of NGOs, often supporting a social-environmental agenda, and can provide an important locus for change.

For-profit organizations address environmental issues but use a business model and have profit generation as one (if not their main) purpose. These include cooperatives, fair-trade organizations, consultancies and registered companies. Media organizations are also normally for-profit (except when government owned). They are important for environmental issues when they promote information and take a position on issues, for example, forest fires, wildlife trade, damaging practices or local efforts towards sustainability. In Phases I

and II, engagement of for-profit groups was typically via sub-grants to companies in the value chains for sustainable agriculture and fisheries products.

Academic and research organizations are key gatekeepers to knowledge, and advisers to local government and the private sector. They may operate as non-profit NGOs (i.e., primarily vision-driven), but also often as for-profit, in that they work as consultants to private sector and government. Three universities and three other research organizations were grantees in Phase I. No universities received grants in Phase II.

Underpinning this community of CSOs are the funding agencies, who to a greater or lesser extent influence the survival and agenda of activities undertaken by CSOs. Funding organizations are described in detail in Chapter 11. Tables 46 and 47 summarize the types of CSOs found in Wallacea.

Some general trends in the way that these CSOs perceive environmental and social issues can be observed. International NGOs tend to be most clearly differentiated into those pursuing a "biodiversity conservation" agenda and those pursuing a "human development" agenda. Even this line is blurred, with language on the fundamental importance of healthy ecosystems and secure livelihoods common on both sides. The advent of the climate change agenda and associated funding has increased interest among both types of organizations for projects that address carbon emissions and adaptation. The difference, however, is in the criteria used to decide where to focus resources, with many large "development" NGOs active in the Nusa Tenggara and Timor-Leste, and "conservation" groups more focused on marine hotspots and key protected areas.

At the national and local levels, there are very few organizations that pursue a purely biodiversity-focused agenda, and many that combine interest in sustainability, welfare and human rights. More often, however, the desire to align development and conservation agendas is shared across CSOs and government and becomes a common entry point for programs.

The for-profit sector's commitment to environmentally positive change is based on the opportunity this presents for improved business. This may be through meeting legal obligations (CSR requirements, environmental and social standards in business operations), market opportunities (certification), or pragmatic need to ensure that local stakeholders are supportive of the operations of the company.

8.1 Indonesia

8.1.1 Operating environment for CSOs in Indonesia

Legal Framework
An Indonesian CSO's legal status depends on whether it is a for-profit or nonprofit entity. Nonprofit entities can be foundations (*yayasan*), associations (*perkumpulan*) or 'NGOs without legal status', which can be registered but have no legal personality. There is no requirement for a group to have a legal status, and many local organizations remain unregistered; however, non-formal institutions cannot open bank accounts or receive assistance from the government or most donors. Most national and local NGOs opt for association status, because it is considered more democratic compared with the foundation, which legally belongs to its founders (Law 16/2001 on Foundations as amended by Law

28/2004). Cooperatives, political parties and educational institutions are covered by separate laws.

International CSOs, or Indonesian CSOs registered by foreign entities, are required to partner with a relevant government agency and to secure an 'in principle' license from the Foreign Ministry and an operational license from the relevant Ministry of Agency of government.

For-profit entities range from companies to cooperatives. A for-profit cooperative model is usually chosen by people's organizations that exist to access credit or to carry out business transactions with other profit entities, especially companies. The formal private sector is a special case, as it is regulated by Law 40/2007 on limited liability companies. Among other things, this law requires publicly listed companies to implement corporate social and environmental responsibility (CSR) activities and programs. While many for-profit organizations engage in social and environmental activities, they cannot receive grants from funders, as audit laws would define the grant as taxable income. For this reason, many larger for-profits establish NGOs through which they channel their CSR funding and which can receive additional funds.

Political space
CSOs work within the existing framework of policies and regulations in a number of ways:

- Using opportunities to contribute to decision making where public participation is legally mandated, such as public consultation during environmental impact assessments, or where the government has created a forum, such as the Working Group on the Acceleration of Customary Forests.
- Encouraging communities to take advantage of laws that allow local control and ownership of resources, including the various social forestry schemes, the regulations on customary forest, and the agrarian reform process.
- Collaborating and partnering with government or private sector entities, including partnership arrangements for management of protected areas, and partnerships between local community groups and plantation companies.
- Working as a coalition with a group of CSOs pursuing a shared agenda, using mass media and networks within government to influence the development and implementation of policy. Indonesia's diverse and open media and high levels of social media use facilitate campaigns and awareness raising. Private sector and academic CSOs have their own groupings, such as the Oil Palm Business Association (GAPKI), which may have well-established links to relevant ministries and agencies.
- Establishing collaboration with government by offering their knowledge and technical skills, especially to local governments in newly created districts, which often have limited capacity. At the national level, specialist CSOs may also be able to collaborate effectively with national ministries on issues where they have a comparative advantage, such as REDD+, low emissions development, the CBD and the Aichi targets.

The rights of all forms of civil society to access public information are guaranteed by the Law on Freedom of Information. There have been some successes using the law, although access to some information (for example, on licenses for plantation development) is restricted and transparency of basic data on land use and land use change remains a constraint for CSOs.

While Indonesia's large and diverse civil society community has many opportunities to influence laws and policies, considerable time and resources are needed to do so effectively. Public consultation processes are often ceremonial, and emphasize top-down dissemination, instead of a genuine consultative effort by the government. Official processes are slow, complex and may be hard to understand and penetrate. Finally, the cost of compiling data and attending these meetings may be a significant drain on the staff time and resources of a small CSO.

Corruption and a weak legal system hinder attempts to hold political leaders and decision-makers accountable for environmental issues, such as forest degradation and deforestation. While corruption in government procurement and during political campaigns has been the subject of action by the national Corruption Eradication Commission, the problem continues to undermine transparent and equitable decision making. This can undermine the efforts by CSOs to promote data-based analysis or to mobilize community action.

The community-based conservation work supported by the CEPF program in Wallacea is generally aligned with the government's agenda of promoting development in remote regions. However, where conservation action includes opposing developments, such as oil palm, timber plantations or large-scale fisheries, local CSOs may find themselves in conflict with powerful networks of private sector and government actors.

Funding for CSOs
CSOs receive funds from various sources, including bilateral, multilateral and philanthropic donors, government projects and private-sector CSR programs. Several national NGOs, such as KEHATI and the Samdhana Institute, source funds outside Indonesia and re-grant them to local organizations. Some CSOs in Wallacea are members of national networks, including Walhi, AMAN and Jatam, and may receive support through their central institution.

The amount of funding available, the complexity of the proposal process and requirements for reporting vary widely. Overall, however, few CSOs in Wallacea have the capacity and resources needed to invest in developing large, multi-year programs with major donors. For smaller CSOs and, especially, grassroots organizations, access to project funding is typically limited by language (requirements to use English in proposals and reporting), dependence on the internet to disseminate information, distance from donor offices and mismatch between the issues that are supported by donors and CSOs' own priorities.

CSOs may also receive funds from the government. Community cooperatives, for example, can access funds from the district government, while village governments have budgets that may be used for protecting and managing resources within the village area (see Chapter 11). Since 2018, a change in the law on public procurement (Presidential Regulation no 16/2018) has allowed Indonesian NGOs to bid for some government contracts to provide services in the social and environmental fields but it is not yet clear to what extent conservation CSOs have been able to take advantage of this opportunity. The same law also allows universities and NGO research institutions to bid for government research contracts.

8.1.2 Civil society programs and activities in Indonesian Wallacea

Major conservation and development organizations at the national level
From an economic and geographic perspective, as well as from the perspective of issues such as climate change, biodiversity and sustainable development, Indonesia is a huge

country. Consequently, the limitations of the ecosystem profile prohibit the inclusion of an exhaustive list of civil society actors in the conservation movement. Only as an overview, such as list would include major conservation organizations (e.g., WWF, The Nature Conservancy (TNC), WCS, CI, Fauna & Flora, IUCN), many of which have Indonesian incorporations (e.g., CI works through a local entity, Yayasan Konservasi Indonesia) or spin-offs (e.g., the Coral Triangle Centre was born out of The Nature Conservancy's former Indonesian marine program). The list of actors also includes major development organizations that work in the sustainable natural resource use space, including Save the Children, CARE, Oxfam and World Vision. There are further leading Indonesian organizations, such as Burung Indonesia and the Samdhana Institute, and notable smaller international organizations that have a national footprint (e.g., Rainforest Alliance, RARE).

For all the organizations named above, their work extends throughout the country, with greater or lesser emphasis on Wallacea, which ebbs and flows with funding availability. Table 46 shows a snapshot of organizational interest and recent history. This is not intended to be a statement of where each organization is active in 2025.

Networks and partnerships
The main environmentally focused networks active in Wallacea are:

- Perkumpulan Telapak: Member organizations work on sustainable natural resource management throughout Indonesia, including coastal fisheries, watershed management and community logging cooperatives in Sulawesi Tenggara.
- JATAM: Member organizations work on advocacy activities related to small island/small watershed and mining issues.
- JKPP: Members organize and implement participatory mapping in Nusa Tenggara Barat, Nusa Tenggara Timur, Sulawesi Tengah, Sulawesi Selatan and Sulawesi Tenggara.
- WALHI: Has members throughout the Wallacea region and works on advocacy for many social-ecological issues (e.g., mining, logging and pollution).
- SUKMA (Sunda Kecil and Maluku network): Members work on small-island socio-ecological issues.
- Mitra Bahari: A network of academic institutions working on coastal and marine issues.
- Extractive Industries Transparency Initiative: A multistakeholder process involving CSOs, private sector and government in monitoring company payments to government.

Various partnerships have been established between providers of funding and capacity-building and their grantees. Examples include the networks set up by the Samdhana Institute and the Ford Foundation, whose partners are mainly local conservation and development organizations.

Table 46: Summary of national and international CSOs active in sectors related to conservation in Indonesian Wallacea

Organization	Areas of Interest in Wallacea	Focus of Activity in Wallacea
Burung Indonesia	Sumba, Flores, Northern Sulawesi, Halmahera, and as RIT of the CEPF small grants program, throughout Wallacea	Forest protection in protected areas and landscapes, CSO small-grants for community-based conservation
CARE Indonesia	Sulawesi, Nusa Tenggara	Community water sanitation and health, climate change adaptation
Coral Triangle Centre	Banda Islands, Maluku Buano Island, Maluku Lease Island, Maluku Sula Islands, Maluku Atauro Island, Timor-Leste Liquica, Timor-Leste	Marine protected area creation and support Capacity building and learning network facilitation for MPA managers, local government, women leaders,
CI	National	Ray and shark monitoring and protection
Fauna & Flora	Sulawesi Selatan	Conservation of the Maros-Pangkep karst landscape
HIVOS	Sulawesi Selatan, Sumba, Timor-Leste	Social tolerance, low-carbon rural energy, CSOs and governance, sustainable agriculture
IUCN	Poso and Malili Lakes complex, Sulawesi	Integrated catchment management planning, species and KBA assessment
Oxfam	Pangkep, Maros, Barru, Pinrang, Luwu, Makassar (Sulawesi Selatan) Bau-bau, Wakatobi, Kendari, Konawe Selatan (Sulawesi Tenggara) Sigi (Sulawesi Tengah) Lombok (Nusa Tenggara Barat) Dompu (Sumbawa, Nusa Tenggara Barat) Flores, Kupang, Timor Tengah Selatan (Nusa Tenggara Timur)	Food security and sustainable value-chains for coastal and small island communities, sustainable agriculture, youth enterprise, CSO and local Government capacity building for SDG monitoring, emergency disaster response
RARE	Sulawesi Utara Wakatobi, Take Bonarate (Sulawesi Tenggara)	Community-based marine resources management and MPAs
Rainforest Alliance	Sulawesi Selatan, Sulawesi Tengah	Sustainable smallholder cocoa production; sustainable water catchment agriculture
Samdhana Institute	Throughout Wallacea	Small grants to local CSOs for resource rights, livelihoods and sustainability; community capacity building and leadership; implementation of the World Bank Dedicated Grant Mechanism for Indigenous and local communities

Organization	Areas of Interest in Wallacea	Focus of Activity in Wallacea
Save the Children	Sulawesi Tengah, Sulawesi Selatan, Nusa Tenggara Barat and Nusa Tenggara Timur	Community development, child education and health
Swisscontact	Nusa Tenggara Barat (Lombok), Nusa Tenggara Timur, Sulawesi Tenggara, Sulawesi Selatan, Sulawesi Barat, Sulawesi Tengah and Gorontalo.	sustainable cocoa production, capacity development for sustainable tourism (Lombok, Wakatobi, west Flores)
Threads of Life/ Bebali Foundation	Flores, Lembata, Lombok, Savu Sea islands, Sulawesi Barat, Sumba, Timor (and Timor-Leste)	Community-based resource management, development and marketing of local weaving and crafts
TNC	Wakatobi (Sulawesi Tenggara), Halmahera (Maluku Utara), Buru, Lucipara islands, Banda seascape and islands (Maluku), Lombok (Nusa Tenggara Barat) and Savu Sea (Nusa Tenggara Timur)	Marine protected area creation and support, regulation of live fish trade
WCS	Northern Sulawesi, Rote island	Forest protected areas, wildlife trade
World Neighbors	Nusa Tenggara Barat and Nusa Tenggara Timur	Community development
World Vision/Wahana Visi Indonesia	Sulawesi Tengah, Nusa Tenggara Timur and Maluku Utara	Community development (including as partners of the Swisscontact sustainable cocoa program)
WWF	Buru, Lucipara, Banda seascapes and islands (Maluku), Lombok and Komodo-Sumba Strait (Nusa Tenggara Barat), Solor-Alor (Nusa Tenggara Timur) and Sulawesi Sea-Makassar Strait	Marine protected area creation and support Species-focused campaigns on sharks and rays

These two types of network organizations often work in partnership with each other. Samdhana, for instance, has developed long-term partnerships with AMAN and JKPP to advocate for Indigenous people rights to customary land and forest.

There are also religious institutions that have played a prominent role in environmental advocacy and human rights, such as the Catholic Church in Flores, which campaigns against mining exploration, and a Pesantren (Islamic Boarding School) in Lombok, which works to conserve local rice seeds in the Rinjani area. These organizations use their exclusive religious networks or connections with local leadership to enable effective policy advocacy work.

Local CSOs in Wallacea and experience from Phases I and II

While the geography of Wallacea might be understood in terms of bioregions (i.e., Sulawesi, Maluku and the Lesser Sundas), the civil society geography of the region is more nuanced. Experience from previous investments shows clusters of local organizations with higher and lower capacities, or geographies that had truly "local" grantees, as opposed to groups based elsewhere in the region. Further, multiple qualified Indonesian groups are based in the major national cities of Jakarta, Surabaya and Denpasar, and engaged in conservation efforts in Wallacea throughout the CEPF investment phases.

In Sulawesi, there were stronger organizations around the two largest cities: Makassar in the south; and Manado in the north. This does not mean that there were no good partners on the rest of the island but only that it was difficult to attract and maintain talent to more remote and difficult-to-reach areas, such as the Banggai islands.

Both politically and in terms of local CSOs, Maluku province is understood separately from Maluku Utara. CEPF's strongest CSO partners in Maluku were based in Ambon, the main city, but with significant input coming from Bali-based groups that had easy air access to the region. There were far fewer strong partners in Maluku Utara, in part due to the political-social history of the last 25 years. CEPF's strongest partners in the Lesser Sundas were based on Flores, the locus of terrestrial conservation in the bioregion.

Outside of these "centers" of CSO expertise, the smaller CEPF grantees promoted grassroots networks, community organizing, small-scale pilot projects and awareness raising. Even though some struggled with the basic administrative and management requirements in the implementation of projects, some grew in ways never anticipated.

From experience, there was a further divide between CSOs working on terrestrial conservation issues and those working on marine issues. Certainly, there were strong groups that worked on both sets of issues. However, for terrestrial-focused groups, there was more of a continuum from high to medium to low capacity; whereas, for marine-focused groups, there was more of a dichotomy between high and low capacity. This informs expectations of the advance outreach to potential applicants, the types of applicants, the quality of applications and what can be expected of grantees.

8.1.3 Organizational development for CSOs in Indonesian Wallacea

The concept of more *resilient* organizations is central to CEPF's vision for civil society in the Wallacea Hotspot. The journey towards becoming a resilient organization will be different for every CSO, depending on its history, purpose, stakeholders and the political and cultural

environment in which it operates but common features of a resilient organization include that it:

- Has a clear mission that is ecologically and culturally relevant to a place.
- Delivers a program that is aligned with the mission.
- Has in place mechanisms to sustain financing and impact.
- Has appropriate governance and is accountable to key stakeholders.
- Forms part of a conservation community, collaborating with and not stifling others.
- Has a positive organizational culture, and motivated and satisfied staff.
- Is innovative, and able to learn, embrace change and manage risk.

Nothing in this definition implies that an organization must be of a particular size or complexity: resilience is just as important for a small community-based organization as it is for a professional, national NGO.

There are a wide range of actions that can support an organization on this journey to becoming more resilient, from simple, technical training (e.g., how to operate a software package) to a long-term, multi-faceted intervention that is intended to bring about fundamental change in the way an organization works. For the purposes of analysis and planning, it is useful to divide these needs and responses into capacity building and organizational development (Table 47):

- Capacity building is the delivery of specific knowledge and skills needed to enhance the performance of a CSO. In the context of CEPF support, capacity building will normally be linked to the development, delivery, monitoring and reporting of grant-funded conservation projects.
- Organizational development is the delivery of a package of support that addresses core institutional needs identified by a CSO, usually over a long timeframe and with the involvement of all or core members of the organization.

Table 47: Key features of capacity building and organizational development

	Capacity building	**Organization development**
Objective	Specific personnel improve their knowledge and skills in a defined area.	The organization has greater long-term resilience and adaptability.
Delivery approach	Often through standard training events and modules, allowing for efficiencies such as training in groups and remote or online learning.	Tailored to the needs of the organization and its environment, with a variety of delivery types and phases over an extended period.
Time and resources needed	Discrete, predictable, typically requiring limited funding and time.	Long-term, requiring significant commitment of time from all levels of the organizations as well as external facilitators. Likely to be costly, but difficult to budget in detail from the start because of the iterative nature of the process.
Measurement of impact	An immediate impact (e.g., acquisition of knowledge) is easy to define and measure, although demonstrating application of that knowledge to improve performance may be more difficult and long-term.	Impact is long-term, may not be possible to define at the start, difficult to measure objectively.

It is important to recognize that there is not a clear division between capacity building and organizational development, and that many actions and interventions will have some of the characteristics of both. For example, CSO staff trying to implement a newly acquired skill may encounter barriers that are to do with the organization's decision-making processes, governance or culture, so capacity building may have to engage with organizational development issues to ensure it has an impact. Conversely, organizational development demands time and commitment from staff, which may take them away from delivering on short-term commitments to donors and stakeholders. It may be that capacity building is needed first, to deliver immediate improvements in performance, which, in turn, motivate staff and create the flexibility, before more organizational-development-focused activities can begin.

Organizational development is a continuous process of positive change towards becoming a more resilient organization. Organizational development does not have to involve external actors but, in many cases, will benefit from expertise and resources from donors and organizational development specialists. Donor funding brings with it the risk of donor influence. For effective organizational development, it is critical that the CSO remains in control of its own process.

The organizational development "journey" is tailored to the needs of the organization, so there is no single blueprint. However, a typical process will have the following stages: initiating the process; planning; delivering organizational development support; monitoring and evaluating impacts; and sustaining organizational development.

Initiating the organizational development process
Leadership commitment from the beneficiary CSO is central, as is buy-in from the personnel who will be involved. The need to secure leadership commitment may influence the entire shape of the organizational development process and having leaders' participation should be mandatory. Having a financial contribution from the beneficiary may be needed as an indication of organizational commitment.

Allocation of staff time and resources is also important, recognizing, for example, that staff who are under pressure to meet project-driven deadlines need to be allowed to allocate dedicated time to the organizational development process. This may require negotiating with project donors, beneficiaries, and partners.

The amount of funding needed may be substantial and needs to be available on a flexible timeline, because outputs and objectives will often be redefined as the organizational development process develops.

Establishing and maintaining trust between the parties involved allows for open communication and discussion of sensitive issues. Where the organizational development process is linked to project funding, the imbalance of power in the donor-grantee relationship is a barrier to open communication. This issue can be mitigated by having organizational development staff at the donor who are (mostly) independent of the grant-making and administration process. The issue can also be mitigated by outsourcing delivery of organizational development support to a third party (which has the additional benefit of bringing in relevant expertise). The way in which the agenda and objectives of the organizational development process are established, which often uses diagnostic tools, also has an important impact on trust and openness.

As part of building trust, adequate time to build a relationship between the CSO and the organizational development facilitator is key and requires the funding flexibility and organizational commitment noted above. Some organizational development providers expect to spend several months getting to know an organization. They may implement a due diligence process or a single activity with the partner (such as a strategic planning process or training in a specific area), to test collaboration, before committing to a long-term process. Where CSOs are already familiar with the donor and organizational development provider (as is the case for CEPF and several potential providers in the Wallacea Hotspot), there may already be a level of trust that can provide a foundation for further work.

Planning the organizational development intervention

Any kind of organizational development intervention should start with an assessment of the specific needs of the organization, leading to agreement on the objectives and delivery. The way that this initial assessment is done should clarify expectations and set the tone for the relationship between funder, facilitator and beneficiary. The process should be driven by the beneficiary, with guidance and support from the facilitator. Initial discussions may include helping the CSO understand what can be achieved and what an organizational development intervention might involve.

To structure the discussion on existing capacity and identify strengths and gaps, supporting organizations typically use some form of diagnostic tool. A common weakness of diagnostic tools is that they ask the respondent to score their own organization against a set of normative criteria, which may not be relevant to the aspirations of the organization. The highest scoring criteria typically resembles the properties of a large, complex, professional NGO, implying that all CSOs should aspire to become larger and more professional, and provide little room for discussion of what is important for the CSO and the local context. There are options where respondents define for themselves what constitutes a satisfactory or less-than-satisfactory situation. There is also a risk that the application of diagnostic tools focuses on weaknesses and failures, which can, in turn, erode trust and support for the organizational development process. One option is an appreciative enquiry/experience-based approach, focused on identifying and valuing strengths, and building on these to address challenges, rather than starting by looking for the weaknesses and deficiencies in an organization's structure and operations.

Planning for a typical, long-term organizational development intervention may progress from diagnostic tool to agreement on overall aims, a first year workplan, and plans and budgets for delivery of specific training and facilitation support. However, approaches that take an individually tailored approach need to be controlled by the beneficiary and respond to changes as the process progresses, so there is no predetermined blueprint. It is more useful to think in terms of a "toolbox" of support that is available, and a process that is created collaboratively by the beneficiary and facilitator, with the backing of a funder.

Delivering organizational development support

Choices and issues that need to be considered in the planning of a program of support include: online versus in-person approaches; and single-organization versus multiple-organization approaches.

Key advantages of online learning versus in-person learning are minimal cost for participants to attend, convenience, and flexibility for participants to engage at a time that

works for them. Important disadvantages, however, include the lack of personal interaction, the temptation for participants to multitask or otherwise be distracted by other pressures in their environment, and a plethora of technical issues, including poor connectivity. Conversely, in-person learning provides high-quality opportunities to engage, share and bond with other participants, including during time spent together outside of formal sessions. Well facilitated, in-person sessions can allow for effective discussion of issues, consensus building and inclusion of voices, which are not normally well-represented. In contrast to online, in-person sessions also offer a more focused experience, with participants less likely to try and multi-task during the training. The challenges of in-person approaches include the cost of travel and accommodation, and the need for all participants to commit to meeting at a particular time and place.

A key advantage of single-organization approaches versus multiple-organization approaches is that they allow for organizational development to be co-designed and tailored to the specific needs of the CSO and delivered at a time and place that is most effective for the CSO. However, these approaches demand more time from the facilitator, and so are more costly, although they are likely to have a greater impact because they are targeted to specific needs.

Many providers of organizational development services offer programs where peer-to-peer learning and the creation of a cohort of graduates is an explicit objective. These are delivered through a series of workshops and events that bring people from different organizations together. This approach has a strong emphasis on selection, with applicants invited to apply and a screening process to ensure that they will benefit from the process. In-person and online events are used to create opportunities for participants to share and learn from each other.

Much of the capacity building and organizational development supported by CEPF in the Wallacea Hotspot, including that facilitated by Yayasan Penabulu and MDPI, brought together people from multiple organizations to participate in single events. There were significant benefits from the peer-to-peer sharing and learning that took place at these events. This extended to the formation of links between participants, which were maintained after the event and became the basis for collaboration between organizations. In addition, multi-organization training was found to be an efficient way to deliver a set of skills, such as project management or financial management, to a large group of CSOs.

Monitoring and evaluating the impacts of organizational development

Monitoring is important, primarily to enable the staff and other stakeholders of the CSO to see that the time and resources invested in organizational development are having a positive impact. “Pause and reflect” periods are valuable during the process, to recognize progress and allow adjustment of plans. In these cases, monitoring may rely more on personal impressions that objectively measurable indicators.

Monitoring is also important to demonstrate to donors supporting the capacity development process that their funding is having the intended impact. When communicating to donors (and other supporters and stakeholders), it is important to present monitoring results in the context of the long-term aims of the organizational development process, and to make it clear that evidence of transformative change in an organization may not emerge for some years.

The diagnostic frameworks mentioned in the planning section (above) are often repeated and compared with the baseline. CEPF did this during the previous phases of investment in the hotspot using the CSTT, although this tool may be more suitable for monitoring capacity building than organizational development. While this approach has the value of producing measurable data that can be compared with other organizations or over time, it suffers from the problem that changes in personal, team and institutional capacity may be intangible and not effectively captured by the criteria used in these frameworks. Also, the scoring will be influenced by who fills in the form, and results can be difficult to interpret.

It is easier to evaluate the immediate impact of capacity building for participants in a group training event that is structured around a fixed syllabus. This does not, however, necessarily correlate with implementation of the newly acquired skills or with wider impact. Post-training follow-up is recommended to give an assessment of the real impact of the skills acquired on performance. Online training presents specific challenges for monitoring.

Sustaining the impact of organizational development
Given that organizational development is an ongoing process, "sustainability" of a specific intervention does not mean that the client organization will never need support with organizational development again but that it is in a better position to plan, access and fund such support when needed. Options may exist for access to on-demand advisory services or mentors, and engagement of networks of similar organizations and communities of practice.

8.1.4 Sources of organizational development expertise in Indonesia

While the idea of CEPF explicitly addressing organizational development is new to the third phase, the concept of support for civil society in Indonesia has a long and deep history. This document cannot adequately summarize all that has happened but can instead point out that much of the Indonesian expertise on "civil society strengthening," "organizational development," and "capacity building" was not developed in the environmental space. Rather, there have been eras of support for CSOs in the context of the Sukarno-Suharto transition of the late 1960s, again with the end of the Suharto regime in the late 1990s, and only most recently with a new set of groups focused on organizational development in the environmental sector.

Many of the practitioners with the deepest experience today got their start in the early 2000s. Considering the politics of the country at the time, there were issues of democratic presidential transitions, ethnic tensions, Islamic nationalism, and regional independence and autonomy movements. Thus, international donors put massive effort into CSOs and their role in democracy and governance. Public funders like USAID, whose funding actually helped start Yayasan Penabulu, and philanthropies like the Ford Foundation and the Packard Foundation, as well as many more, provided the funding base for many other groups to develop local expertise in organizational development. Among others, local expertise can be found in the following organizations:

- SMERU Research Institute.
- Ananta Fund.
- Aliansi Masyarakat Adat Nusantara (AMAN).
- Samdhana Institute.
- Yayasan PLUS.
- Yayasan Wahana Lingkungan Hidup Indonesia.

Any effort to support organization development should look to service providers such as these, and learn from the experience of the Ford Foundation's BUILD program, which provides multi-year general operational support grants to allow CSOs to focus on strengthening their financial resilience and organizational governance.

8.1.5 Funding organizational development

The cost of long-term organizational development support is dependent on the specific needs of the CSO and the design of the process. The main costs will be the time of facilitators/mentors to support the process, travel and accommodation costs for the facilitator to meet with the CSO, and the organization of workshops, retreats and other meetings. Costs could vary widely based on the provider and their typical clientele.

Funding agencies that support CSOs to undertake conservation projects are frequently unwilling to allocate more than a fraction of their funding to activities that are not directly connected with delivering the objectives of the project, such as organizational development. Where they do support capacity, this is often delivered to suit the donor's agenda, timetable and budget, rather than being tailored to the specific needs of the CSO. Secure funding, that does not impose an agenda on the recipient or otherwise exacerbate donor-beneficiary power inequality is critical for organizational development.

Donors adopt at least four models of funding organizational development:

- Unrestricted funding to the beneficiary CSO that does not require any detailed reporting or accounting and allows the organization freedom to invest in organizational development or projects. Unrestricted approaches are typically used where there is a long-standing relationship and high level of trust between donor and CSO.
- Grants specifically for organizational development to the beneficiary CSO, which are typically managed as a project, with a budget, defined objectives and accountability to the donor. This model means that a degree of control is retained by the donor (depending on donor requirements) and the CSO is accountable to the donor for its own capacity development. However, compared to making a grant to an organizational development provider (see below), this model gives the CSO greater control over choosing and managing the support it receives.
- An organizational development component included in a larger grant for a conservation project. For donors such as CEPF, where organizational development is a means to achieve lasting biodiversity conservation, this modality has the advantage of maintaining closer links between the investment in organizational development and conservation objectives. Organizational development may have a greater and more sustained impact when it is combined with project implementation. At the same time, there is a risk that the organizational development element is eclipsed as grantees strive to achieve conservation targets. It may be most appropriate for capacity building activities, where the capacity to be developed has direct links to delivery of the project.
- Grants awarded directly to organizational development service providers. This approach reduces the administrative burden on the CSO and allows for efficiencies (e.g., a service provider might be funded to provide organizational development support to several grantees under one grant) but it reduces the agency of the

beneficiary CSO in selecting and managing the provider. This problem could be overcome if the CSO was involved in the selection of the provider.

Combinations of these modalities are possible and, indeed, may be very effective. For example, a grantee awarded a grant for conservation action could apply for a specific organizational development grant, or an organizational development service provider could receive a grant to provide support to set of CSOs implementing conservation projects. In these cases, there may be tensions between the pace at which different CSOs are proceeding with organizational development and the timeframes of projects, and it may be useful to allow organizational development support to continue beyond the end of conservation projects.

There is an argument for maintaining a strong link between conservation project funding and organizational development funding. The purpose is to enhance both aspects of the work. Organizational development interventions are more likely to have a sustained impact if they deliver priority skills that can be applied immediately, while management of a conservation project will be more effective if areas of weakness, for example financial management or accountability to local stakeholders, receive targeted support. Experience from CEPF's global portfolio is that new ways of working developed in the context of conservation projects are more likely to be internalized and to result in permanent changes in the way that teams and organizations work.

However, combining organizational development and conservation project implementation has risks, if the CSO loses control of the support for organizational development. This risk can be managed by providing separate funds for conservation projects and organizational development support, and by maintaining an institutional firewall between the donor (i.e., CEPF) and the organizational development advisory team, which is a small team based in the region.

Investment in long-term organizational development requires trust between beneficiary, service provider and donor, and a high degree of control over the process by the former. This is challenging to achieve when organizational development funding is tied to the delivery of a short-term (1-3 year) conservation project, and seems to argue for separate organizational development funding, with a long-term commitment and a high degree of autonomy for the CSO. Such an approach carries its own risks, of course, including that the organizational development process loses focus or fails to deliver hoped-for improvements.

Ultimately, given the diversity of CSOs working on conservation in the Wallacea Hotspot and of their organizational development needs, a combination of approaches is likely to be needed that reflects the type of need, the stage of development of the CSO, and the history of grant-making and collaboration between the CSO and CEPF. A targeted, short-term approach to capacity building, linked to a conservation project grant is likely to be appropriate for:

- Situations where a specific technical skill/knowledge is required and can be efficiently delivered.
- Organizations with limited project implementation capacity.
- Organizations that are unknown to CEPF.

Conversely, a separate organizational development grant is likely to be appropriate where:

- The CSO wants to engage in a long-term program of organizational development.
- The CSO has the capacity to plan and manage the organizational development process (with support as necessary).
- The CSO has a strong track record with CEPF and potential to have a major impact on conservation, which justifies the greater risk and investment likely to be involved.

Chapter 13 proposes a model for delivery of CEPF support under Strategic Direction 4.

8.1.6 The state of civil society capacity in Indonesian Wallacea

A grant-making program is dependent for its success, and, especially, its long-term impact, on the existence of CSOs that have the interest and capacity to plan and implement effective conservation actions. The prior ecosystem profiles identified key gaps in the capacity of CSOs in Wallacea, including:

- Lack of knowledge about the environment, which limits CSOs' ability to make the links between conservation activities and wider social and economic development issues. This leads to an understanding of conservation as being primarily about restricting local peoples' access and opportunities, rather than focusing on sustainable livelihoods.
- Significant variation in the capacity of CSOs to develop project plans and proposals, with urban-based CSOs typically being stronger (but still often limited) than rural-based organizations. This includes low capacity in fundraising and sustainable financing of programs.
- A lack of knowledge of laws, regulations and their implementation, which limits CSOs' ability to define problems and potential solutions.

The profiles also noted geographic differences within the hotspot: between the big cities of Sulawesi and remote areas of the bioregion; between Ambon and other parts of the Maluku bioregion; and between Flores and the smaller islands in the east of the Lesser Sundas.

In response to the limited capacity of CSOs, a "grants plus" approach was adopted in Phases I and II, combining funding for conservation action with capacity-building support to both technical and administrative aspects of the grantees' operations. The approach was successful in many cases, with grantees reporting improvements in key aspects of organizational capacity. These results are discussed in greater detail in Section 3.9. Notable inputs included from:

- Yayasan Penabulu (Phase I), for analysis, capacity building and mentorship for most local grantees.
- Yayasan Rekam Jejak Alam Nusantara (Phase I), for building communication capacity among selected grantees.
- Yayasan Mitra Masyarakat Sehat Indonesia (Phase I), for facilitating partnerships between grantees and the private sector.
- Asosiasi Perikanan Ple and Line dan Handline Indonesia (Phase II), for grantees seeking access to fisheries markets.
- Yayasan Masyarakat dan Perikanan Indonesia/MDPI (Phase II), for fisheries management training.

8.1.7 Capacity and organizational development needs of CSOs in Indonesian Wallacea

The capacity and organizational development required by CSOs in Wallacea to successfully conserve species and sites is linked to the threats that they face. Experience from the first two phases of investment shows, to varying degrees, threats from:

- Hunting and collecting (terrestrial and marine).
- Local agriculture and livestock.
- Mining, oil and gas production (terrestrial and marine).
- Small-scale logging.
- Expansion of urban areas and tourist facilities.
- Invasive species (mainly a threat to freshwater ecosystems).
- Unsustainable small-scale marine fishing.
- Industrial fishing.
- Pollution and sedimentation (terrestrial and marine).

Addressing threats sometimes requires technical capabilities that are only possessed by a minority of CSOs working in the hotspot, such as the ability to undertake: legal and policy analysis; national-level networking and advocacy; multi-stakeholder processes at the scale of entire landscapes or catchments; or specific scientific and technical studies on species management. Where these threats are a priority, it may be appropriate to link local CSOs with organizations from outside Wallacea with relevant expertise.

Beyond these technical issues, CEPF, and, previously, together with Yayasan Penabulu, has analyzed its past partners and the broader conservation community in terms of their needs for support with governance, delivery, management systems, human resources and financial resources. Results varied among CSOs, of course. Nevertheless, universally, they expressed needs, to a greater or lesser extent, in each of these areas.

8.2 Timor-Leste

8.2.1 Civil society organizations in Timor-Leste

During the era of Indonesian rule, CSOs in Timor-Leste were closely identified with the struggle for independence and could be classified as resistance, church and youth/student movements. Following independence, the number of CSOs grew dramatically, catalyzed by political freedom, post-conflict and internally displaced persons crises, and the availability of international donor and government petroleum fund financing. The Timor-Leste NGO forum FONGTIL was formed in 1998 with just 14 registered NGOs, mostly involved in human rights and advocacy work (ACFID 2008). However, it had grown to 201 registered NGOs by 2019 (FONGTIL 2025). Nearly all CSOs in Timor Leste are dependent on outside funding and, therefore, go through phases of being active and inactive. Overall, CSOs in the country have proven to be active contributors to communities and the government (ADB 2018).

As in Indonesia (see above), the distinctions between people's organizations (including community-based organizations (CBOs)), NGOs and for-profit organizations provides a useful framework for classifying CSOs (Table 48). For national and local organizations, the distinction between NGOs and CBOs has become particularly important, because of the

requirement for NGOs to register with FONGTIL to access funding from international donors. CBO is a term often used for common interest groups that form at the village level.

International aid and development NGOs have been prominent in Timor-Leste, first as providers of emergency assistance under the UN Administration, and later engaged with livelihoods, education and social welfare, democratization and peace-building efforts. As Timor-Leste has stabilized politically and started to use funds from its own oil resources to fund development, many international NGOs have or are planning to close their programs in the country. Most international NGOs are dependent on funding from the funding agencies described in Chapter 10.

The national and international for-profit sector within Timor-Leste is dominated by oil companies, with a few construction and agricultural commodity companies. CSR schemes are not mandatory and do not feature as a major source of funding for CSOs. Timor-Leste, however, has a good record with the implementation of the Extractive Industries Transparency Initiative (EITI), and this might provide a platform from which to start engagement with companies that are concerned about environmental sustainability, both for image-making and to secure long-term business prospects. The Chamber of Commerce is an entry point for engagement with the private sector.

Other important elements of civil society that do not fit the above classification include:

- **Religious groups**, in particular the Catholic Church, which is a major provider of social services but also a political force and a large land holder in its own right. The church is influential at both community and government levels. While it remains conservative on many social issues, it is potentially a highly influential agent of change. A number of Catholic Church-affiliated international aid agencies work in Timor-Leste and channel support through the church.
- Activities by **academic and research organizations** have been dominated by foreign players, with many researchers from Australia but also other countries working on social, cultural and environmental topics. Capacity among Timorese academics and researchers to partner with foreign workers is limited, and export of knowledge by foreigners without adequately communicating their findings or contributing to capacity-building in Timor-Leste is perceived as a serious problem by local stakeholders. The contribution of the Timorese to consultancy work on government and aid agency studies and program design is limited but growing. The University of Timor-Leste (UNTL) and the Dili Institute of Technology are stakeholders in the National Biodiversity Clearing-House Mechanism. Opportunities for tertiary level education relevant to the environment in Timor-Leste are limited. UNTL has a biology faculty and recently started a fisheries course. Universidad Continental (UNITA) and the East Timor Coffee Institute both have forestry courses, but they focus on technical forestry management, not ecological aspects.
- **Media** in Timor-Leste remains underdeveloped, with access to newspaper and radio reporting mainly in Dili, and limited internet access outside urban centers. The media focuses on social economy and security issues. The International Center for Journalists has implemented activities in Timor-Leste to increase the quality and accessibility of media reporting. In rural communities, behavior change research has shown that ideas and information are largely transmitted by word of mouth, and that people trust respected local sources (church, subdistrict head, customary elders, etc.) more than they do electronic or print media, or politicians and officials.

Table 48: Classification and examples of CSOs in Timor-Leste

Origin and Scale of Organization	Category of Organizations and Examples from Wallacea		
	People's Organizations (primarily exist to serve the interests of members)	**Nongovernmental Organizations** (primarily exist to pursue a vision of social or environmental change)	**For-profit** (primarily exist for the financial benefit of owners and shareholders, but consider social and environmental factors)
International		CI, Mercy Corps, Oxfam, CARITAS, troiche	Oil companies and associated service industries
National and subnational	UNAER, Hasitil, Front Mahasiswa	Haburas, Permatil, Lao Hamatuk	Government-owned oil exploitation companies, agricultural producer and export companies, tourism operators, media
Community-based or site-based	Fishers groups, farmers groups, cooperative work groups, cultural organizations	JEF Covalima, MDI, Natureza, Fraterna, and many more	Community cooperatives, dive operators, community-based media

8.2.2 Operating environment for CSOs in Timor-Leste

Legal framework

During the UN Administration in Timor-Leste, donor agencies used registration with the NGO Forum FONGTIL as a way of ensuring a minimum standard of NGO accountability, administrative and management capacity. Decree Law No. 5/2005 on Non-Profit Making Corporate Bodies requires international and national NGOs to register with the Ministry of Justice. However, the process is unclear to many NGOs, and, in practice, registration with FONGTIL remains common practice and is considered by the majority of international donors as sufficient registration for funding purposes. One of the contributors to the update of the ecosystem profile reported that NGOs wishing to act as consultants, rather than grantees, should legally be registered with the Department of Legal Affairs.

There is no legal requirement or process for registration on other types of CSOs, which greatly outnumber NGOs. The GEF Small Grant Program (SGP) found that the majority of CBOs that applied for funds had no legal status, and accepted recognition from the subdistrict head (*Chef du Suco*) as adequate for grant-making (J. Rosario Pereira pers. comm. 2013). Some NGOs were also not registered, and the GEF SGP assisted them in registering.

Beyond registration, Timor-Leste does not have a regulation governing incorporation of non-profit associations. There are, thus, no legal requirements for NGOs to be financially transparent or open to scrutiny by the public. Nor are there obstacles to receiving funds from outside the country.

The Ministry of Economy and Development (2012) noted that the legal framework that regulates the work of CSOs is weak due to poor implementation, a lack of enforcement and limited dissemination as a result of inadequate human resources and capacity.

Simple administrative issues are obstacles to the development of small CSOs. Service from banks is bureaucratic and slow. Opening a bank account costs money, and the GEF SGP found that few CSOs have accounts in the name of the organization. If there are no funds left at the end of a project, the bank will close the account, forcing an organization to repeat the process of opening a new one (J. Rosario Pereira pers. comm. 2013).

Political space
There are a number of opportunities in law and policy that allow CSOs to pursue goals related to the environment:

- Decree Law No. 5/2011 on Environmental Impact Assessment gives an opportunity for third-party complaints, although the recently passed mining act exempts mining from the EIA requirement.
- Decree Law No. 5/2016 on the National System of Protected Areas establishes participatory land-use planning and multistakeholder committees as the basis for management of protected areas, opening an opportunity for relevant CSOs to participate in conservation directly, or facilitate the participation of local communities.
- Law No. 13/2017 on the Special Regime for the Ownership of Immovable Property introduces the concepts of "community property" and "community protected areas". These amount to the recognition of the existence of community land rights, and the right to be consulted on planned developments, even though it is unclear how far this will protect a community from unwanted external development. The law will present an opportunity for CSOs to map and register the land claims of customary communities, and a starting point for influencing decisions over licensing for private sector projects on community land.
- The GoTL Transparency Portal allows all citizens to access and monitor available budgets, both from the government and from development partners. This program is designed to strengthen good governance and transparency, minimize corruption and manipulation (Ministry of Economy and Development 2012).

In addition to the consultation mechanisms enshrined in laws and decrees, a number of opportunities exist for CSOs to influence environmental decision-making. The Department of National Parks and Wildlife has collaborated with CSOs where they bring resources (external funding) and skills (participatory planning or biodiversity survey) to support the creation and management of protected areas. The legal system has been used successfully to defend the rights of communities against appropriation of land by private investors, and could potentially be used more widely where community interests and areas of high conservation value overlap.

Limits to political space
The opportunities and rights for civil society to engage with government decision-making are changing, and they are increasingly defined through key laws, such as the Land Law. Despite changes in the political climate after independence, clandestine structures and modes of operating have remained ingrained in many government and civil society networks and the individuals who are involved (Engel 2007). Thus, while the National Development Plan and many government statements are positive toward involving civil society in policy development, lack of time and resources, and in some cases, a narrow interpretation of "participation" have often limited consultation to one-way inputs by a subset of the relevant

actors. The degree of consultation and participation mandated varies between legal instruments or is left unclear.

Funding availability
Many CSOs were created or expanded on the basis of the large volume of donor funding in the country between 2000 and 2005, in the run-up to and immediately following independence. Since then, the funding situation became increasingly difficult, and ACFID (2006) found that CSOs funding applications were often unsuccessful, that funds were provided for specific, short-term activities, without access to technical support. After completion of a project, CSOs tended to become inactive in the field while they sought further donor funds. Such cyclical support damages sustainable relationships with communities and undermines long-term commitment to development. It also means that CSOs pay greater attention to donor-articulated needs than to the needs of the communities they seek to serve. Many Timorese NGOs have operated only as the local partners of international NGOs and lack the capacity to formulate projects and submit proposals independently once these partnerships end.

The only functioning CSO funding mechanism for environmental work is the GEF SGP, implemented by UNDP with a multistakeholder national steering committee. The SGP awards grants of up to US$75,000. Since its launch in 2013, the program has provided funds and technical assistance to 35 NGOs and 23 CBOs to support communities solve environmental issues and improve their livelihoods (UNDP 2025b). Several of the projects supported by these grants have taken place in or around KBAs.

8.2.3 Civil society programs and activities in Timor-Leste

Major conservation and development organizations at the national level
CI began work in Timor-Leste in 2009 and remains the only international NGO to work wholly on conservation and environmental issues in the country. CI works directly with government and local community partners to improve local food security, fight climate change and enhance local livelihoods, primarily through establishing a functioning national protected area network.

Beyond CI, a wide range of international NGOs touch on environmental issues through their work on rural community development and livelihoods issues. Major ones include Care International U.K., Mercy Corps, HIVOS Netherlands, Austrian Red Cross, Oxfam, Caritas. The Asia Foundation has a large program in the country but has not yet addressed environmental governance directly (in contrast to The Asia Foundation in Indonesia, for example). Its current programs in the country focus on good governance, inclusive economic growth and women's empowerment. Many of these organizations get their funding from the bilateral and multilateral donors detailed in Chapter 10.

The range of national NGOs includes the following:

- Haburas Foundation, which is Friends of the Earth in Timor-Leste, is the oldest environmental-focused NGOs in the country, established in 1998. It works on a range of activities concerned with the promotion of environmental awareness, advocacy, and sustainable community management of resources.
- La'o Hamutuk is an advocacy organization that focuses on the monitoring and analysis of state development projects, programs and policies, and advocacy on the

social and environmental issues that they raise. It emphasizes support for people's participation in the national development process.
- Mata Dalan Institute works on an implementation of *tara bandu* customary resource management practices in Emera district.
- Permacultura Timor–Leste (PERMATIL) promotes sustainable agricultural practices, management of water resources using customary mechanisms, and maintaining local agricultural plant diversity.
- TMap promotes the use of mapping and GIS for development. It assists communities to register land claims under the 2017 Land Law.

Networks and partnerships
FONGTIL is the NGO umbrella group in Timor-Leste but there are a number of other civil society networks collaborating on advocacy issues, in particular. These include Rede ba Rai, the civil society land network, and Hasatil, a network of NGOs, CBOs and other groups advocating for farmers' rights. At the sub-national level, there are NGO networks in most districts with varying levels of networking capacity.

Cooperation between CBOs and NGOs is common and is usually based around a common program, as shown by the work done by IMI with HDI and KSI. FONGTIL has also developed a partnership with other national and international organizations, such as EMUF, Search for Common Ground, Progressio, and including the government (Ministry of Natural Resources). Specific cooperation in research on agriculture has been developed by Permatil to study local seed varieties in Aileu with ASTI, and measuring agro-biodiversity with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

8.2.4 Civil society capacity in Timor-Leste

Capacity required
The major threats to biodiversity in Timor-Leste are over-fishing and over-hunting, smallholder agricultural expansion and, in specific locations, infrastructure development and urbanization (see also Chapter 9). In addition, key cross-cutting drivers include: lack of resources from the government for the definition, planning and management of protected areas; an unfinished legal framework for conservation and natural resources management; weak law enforcement; and poor management of knowledge and information among stakeholders. To respond to these issues, the key capacities that need to be represented among CSOs in Timor-Leste are:

- The ability to conceptually link conservation with livelihoods issues and to communicate this to local decision-makers and communities.
- The ability to facilitate community processes and support sustainable resource management.
- Knowledge to propose appropriate technical interventions for communities.
- Ecological/environmental knowledge to identify and monitor critical environmental indicators, including species populations.
- Legal knowledge and experience, including advocating policy development and using the law to defend rights and pursue conservation objectives.
- The skills to compile information and successfully engage in advocacy campaigns on development issues.

- The ability to communicate the importance of conservation to local and national decision-makers, to advocate for mainstreaming of conservation into policy and for greater resource allocation for environmental management and protection.

Existing CSO Capacity
Through working on numerous projects for delivery of aid and to address specific social issues, a number of NGOs in Timor-Leste have built up considerable experience of participatory approaches, community assessment, local education and awareness campaigns, and development of community-level enterprises. The GEF SGP reported that CSOs associated with the church tend to have better capacity (J. Rosario Pereira pers. comm. 2014). Specific NGOs have experience with policy analysis and advocacy, the use of legal instruments to defend community rights, and facilitation of processes based on indigenous knowledge and belief, including *tara bandu*. Working on common programs has also developed their capacities to cooperate with each other and to learn.

Gaps in civil society capacity
During the development of the original ecosystem profile in 2013-2014, a comparison of the 'capacity required' and 'current capacity', along with a discussion with numerous stakeholders, identified the following critical gaps in CSO capacity in Timor-Leste:

- Lack of knowledge and experience to plan and implement technical conservation actions, such as forest management, biodiversity survey and environmental monitoring. To a limited extent, these skills exist within government, particularly in the Forestry Department, and the lack of CSO capacity may be alleviated by collaboration with these agencies.
- Lack of ability to identify and articulate the link between conservation and livelihoods, and thus to communicate this link to stakeholders or to develop projects and write proposals on this theme.
- Lack of ability to advocate for greater attention to conservation and the environment by the government, increased resources and the mainstreaming of these issues in all relevant policy areas.
- Incomplete understanding of how conservation goals can be integrated with customary knowledge and practice in ways that are sustainable and avoid undermining customary practice in the process.
- Difficulty in securing sustainable funding and a poor general capacity in financial planning and management. Few organizations are able to access funds and manage budgets of more than US$500,000, and most work with far less than that, often less than US$10,000.
- Lack of legal knowledge and experience with advocacy needed to support communities to challenge land appropriation and damaging investments through the legal system.
- Lack of an effective mechanism to share data, information and knowledge among stakeholders working at the same sites and on the same issues.

8.2.5 Addressing gaps in civil society capacity

Recommendations on capacity building
Support for capacity building should not be limited to grantees but, within the limits of the resources available, it should endeavor to build the capacity of the wider CSO community, including networks and partners such as universities, government departments and private-

sector companies. During the preparation of the original ecosystem profile, the Wildlife Department, for example, highlighted training for forest guards to do education and awareness (not just enforcement), education for communities, and skills in participatory land-use planning as priorities. The NGO forum FONGTIL is a possible entry point for offering capacity-building opportunities to a wide range of Timor-Leste NGOs, while the GEF-SGP provides one entry point for contacting CBOs that are interested in conservation-related activities.

Building stronger CSO capacity to analyze, plan, internalize learning and manage their organization effectively is a long-term process that should be focused on key organizations (those with an important role to play in delivery of conservation goals), and should be integrated with capacity-building efforts to be implemented by other projects and programs. While some skills can be delivered effectively through training, this kind of capacity is often best built through relationships in which a CSO is paired up with staff of a more experienced organization. Activities might include coaching, on-the-job training, and opportunities for CSO staff to spend time working in other organizations.

Technical capacity building and developing the skills and knowledge to implement specific conservation interventions can best be addressed through opportunities for cross-visits, formal training and access to written materials. Technical capacity building should address the needs of priority sites and species but should also be seen in the context of building a community of CSOs that can contribute to the delivery of the NBSAP and Decree Law No. 5/2016 on the National System of Protected Areas, including participatory planning and multistakeholder management of protected areas. Many of the technical skills and knowledge identified above as capacity needs exist within some Timorese CSOs or other institutions, including government and universities. Creating long-term relationships among organizations with different skill sets may be an effective way of filling capacity gaps in the short term and enabling organizational learning in the longer term.

Assisting communities to use the law to challenge poor policy-making and private-sector investments, in particular environmental impact assessments and environmental licensing, is an area that appears to have more potential in Timor-Leste than Indonesia. Sharing experience between social sectors (where the approach has already been used successfully) and the environmental CSO sector would help to create networks through which communities and CSOs can find the skills they need.

Capacity building should emphasize sustainability and limit dependence on donor support. Establishing accessible repositories of digital and written materials, support networks, and links to further sources of funding and support should be prioritized.

It is important to structure grant-making programs so that organizational weaknesses are not an obstacle to accessing grants, and so that capacity-building is integrated into grant-making. Assistance, especially to CBOs, for project identification, proposal development and budgeting will be an important first step. Options need to be available to ensure CBOs are not disadvantaged by barriers to entry, such as requirements for a bank account in the organization’s name, full legal registration, or use of foreign language and sophisticated analysis (e.g., logical frameworks) at the proposal stage. At the same time, an early assessment of the capacity of potential grantees will enable tailoring the needs of the grantees’ capacity-building and minimize the risks to successful grant implementation.

9. THREATS

The landscapes and habitats of Wallacea have been altered by humans for thousands of years. The pace of change, however, has accelerated, with only 15 percent of Wallacea's terrestrial habitats intact, and widespread damage to marine habitats, especially coral reefs. Throughout Wallacea, biodiversity is threatened by a combination of habitat loss, degradation and direct exploitation, which is reflected in the fact that the region holds 36 percent of Indonesia's threatened species, including 48 percent of its threatened bird species, 35 percent of its threatened mammals and 46 percent of its threatened amphibians (IUCN 2021). The threats are a combination of local, smallholder-driven pressures, industrial resource extraction and agricultural development, and government-funded infrastructure and economic-development programs. While terrestrial habitat loss has not yet reached the scale of that seen in Sumatra or Kalimantan, the islands of Wallacea are a development frontier for extractive industries and agribusiness, and further clearance and fragmentation will inevitably occur over the coming decades. The critical question for biodiversity is where the damage occurs and to what extent it impacts on natural habitats.

This chapter summarizes the main threats to biodiversity in Wallacea, divided into sections on Indonesian and Timor-Leste. For terrestrial habitats, conversion to other land uses, degradation and fragmentation are the primary causes of biodiversity loss. Other pressures, such as direct exploitation, are a problem for specific commercially valuable species. Competition with, and predation by, invasive alien species is a threat for some species at specific sites, especially for freshwater species. For marine ecosystems, direct over-exploitation is the key threat for a subset of species, while pollution, sedimentation and other forms of disturbance are reducing the quality of habitats.

Indirect drivers of biodiversity loss for both terrestrial and marine ecosystems include a set of regulatory issues (absent, inappropriate and poorly enforced regulation), capital-intensive economic development (plantation, industrial forestry and mining, supported in some cases by subsidies and global demand for commodities), and increased intensity of small-scale resource use (driven by increased population pressure, changing technology, monetization of traditional economies and weakening of the customary regulation of resources). These factors interact in complex ways that produce different outcomes in different situations, so that demonstrating causality and apportioning responsibility for biodiversity loss is difficult.

9.1 Overexploitation of natural resources

9.1.1 Unsustainable industrial logging

Logging selectively removes specific tree species, opens the forest canopy through road building and damage from felling operations. Thus, it changes the forest structure and species composition, with increased growth of dense understory and climbers, as more light penetrates to the forest floor. These changes benefit some species but, especially where the impacts are extreme, tend not to be tolerated by forest-specialist species. Logging that is managed to be sustainable is considerably less damaging than clearance for agriculture or mining, and in some cases the presence of logging companies has deterred illegal logging and hunting.

Much of the logging in Indonesia, however, is unsustainable, leading to serious degradation of the forest, and allowing smallholder agriculture and illegal logging to move in using logging roads. Once forests are degraded to the point of economic extinction, they are candidates for conversion to non-forest uses, such as oil palm. An alternative pathway (restoration of economic and commercial values) was created by the Ministry of Forestry in 2004. However, no restoration licenses were issued in Wallacea before the ecosystem restoration policy was replaced by a forest use and utilization policy in 2021, under which ecosystem restoration was only mentioned as one type of utilization.

In 2021, there were 38 valid licenses for natural forest logging concessions in Wallacea, covering 1.9 million ha (see Chapter 6 for further details). No data are available on the sustainability of these concessions, except that at least one concession in Wallacea has Forest Stewardship Council (FSC) certification: Gema Hutani Lestari, which has a 148,000 ha concession on Buru island and a mill in Makassar. Hutan Jaya Lestari, a community logging operation in Sulawesi Tenggara, was certified but lost its certification in 2015 (FSC 2025).

Unsustainable logging is driven by weak enforcement of regulations on cutting volumes and areas, which is caused by a lack of budget and of trained and motivated staff to carry out inspections. Since 2009, the Indonesian Timber Legality Standard has been implemented, requiring independent verification and creating mechanisms for third-party complaints. Thus far, however, the scheme is concerned with legality, in the sense of having the right documentation, and not the overall sustainability of the operation. Evaluations have found that support is needed for small businesses and community-based operations to achieve the standards required (Setiahadi *et al.* 2020).

Logging in natural forest seems unlikely to increase as a threat to forests. A total of 10.3 million ha of forest in Wallacea is classified as 'production' or 'limited production' and, therefore, eligible for issuing logging licenses. Data are not available on how much of this has already been logged but the natural forest logging industry has been contracting over the last decade, and it is more likely that these forests are threatened by conversion to industrial timber plantations, or clearance and small-scale mining.

9.1.2 Small-scale and illegal logging

The damage caused to a forest by illegal logging (unplanned, unlicensed and unregulated) depends on the equipment used, the number of people involved and the specific species targeted. Illegal logging is not always small scale; in the wave of illegal logging in Indonesia between 2000 and 2005, there were places where gangs of workers and trucks removed large volumes of timber. Where there is a market, these operations will take every commercial tree, irrespective of size, reducing the forest to secondary scrub. At the other end of the scale, hand-carried chainsaws allow illegal loggers to extract individual trees from terrain that commercial operations would not exploit. The difficulty of carrying timber by hand limits this kind of activity to areas within two or three kilometers of roads or rivers. For this reason, illegal logging often moves into abandoned logging concessions, using the roads and clearing out the undersized trees that should have been left to grow.

The drivers of illegal logging are the inability or unwillingness of the local forestry agencies to monitor and enforce the law over vast areas of land. Illegal logging has always been a problem but it escalated when rapid political decentralization after 1998 led to challenges to

the central government's control over the national forest estate and a wave of illegal logging, some of it by forest-edge communities but much of it by logging gangs organized and financed by urban-based patrons. Exhaustion of valuable timber and improved law enforcement in 2005 helped to stem the problem. A contributory factor was that many local and Indigenous communities perceived the forest to be rightfully theirs. They resented the issuing of licenses to companies to exploit the forest, and saw the arrival of illegal loggers with financing and equipment as an opportunity to become loggers themselves or to allow loggers to operate in their area. In some areas, illegal logging has powerful local political backing and creates rent-seeking opportunities that have fed corruption and undermined law enforcement.

Data on the scale and impact of illegal logging are absent, except in some national parks. In many cases, it has played an intermediate role, continuing a process of opening up and degrading the forest started by licensed logging companies, and finished off when the heavily degraded forest is converted to agriculture or timber plantation forest.

In some cases, small-scale logging is carried out by communities, primarily to fulfil their needs for house- or boat-building timber. On small islands remote from markets and ports, the alternative of importing timber may be prohibitively expensive. In many traditional communities, extraction of specific timber species is mandated by customary norms and beliefs. Even where these customs are still strong (in West Sumba, for example), the cost of structural timber has become prohibitive and houses are being built with concrete frames and light steel roof beams. The cultural importance of timber has also led to an increased interest in planting of timber species.

As populations grow, illegal logging will continue to be a problem but clearer definition of local rights over forests and greater cooperation between communities and forest agencies may help to stop it from becoming large scale. The risks are particularly great on the development frontiers, such as Halmahera and Seram, where building of new roads opens up forest that was previously inaccessible.

9.1.3 Unsustainable small-scale fishing

Unsustainable harvest of marine biota-fish for consumption, sea cucumber, clams, shark and rays and many others-can be broadly divided into unsustainable small-scale fishing, and illegal, unreported and unregulated (IUU) fishing (see Section 9.1.4). There are overlaps and interactions between small-scale and IUU fishing-fishers in local communities may be involved in both, and IUU fishing may degrade stocks which could otherwise be managed sustainably by local small-scale methods.

Unsustainable small-scale fishing is undertaken largely by local people and is often the mainstay of livelihoods and the local economy. It may be for local consumption, regional food markets or specialist global trade. The capture and trade of Napoleon wrasse (*Cheilinus undulatus*), bump-head parrotfish (*Bolbometopon muricatum*), sea cucumber, sharks and rays, and live ornamental reef fish has intensified as a result of improved transport and access to specialist markets globally. It becomes unsustainable when the catch is greater than the ability of the population to recover, when immature individuals are taken out of the population, or when the methods used cause widespread damage to other biota and the marine environment, as is the case with bomb fishing and poisoning.

Over-fishing can be highly damaging, especially where bombs and poison are used. It changes the relative abundance of different groups of fish (e.g. those that eat plants and algae, coral, invertebrates or other fish) and so impacts on the dynamics of the ecosystem. In coral reef areas, pressure from destructive fishing interacts with climate change and other pressures, such as sedimentation, to stress the coral to the point where disease and bleaching result, and this may be followed by the physical erosion of the reef.

Unsustainable fishing was identified in the 2014 ecosystem profile as the most prevalent threat to marine KBAs, reported at 36 of 49 sites (74 percent). New research based on surveys of 622 reefs across 17 regions of Indonesia provides further evidence of the impoverished state of coral reefs across the region, using fish biomass (Campbell *et al.* 2020) but also measures the effectiveness of conservation efforts. Open access reefs close to markets and populations centers averaged reef fish densities of only 310 $kgha^{-1}$, while the reefs in remote sites were 4.6 times higher, on average, 1432 $kgha^{-1}$. Biomass in no-take reserves and gear restricted sites was c.1.4 times higher than open access sites. Gear-restriction and no-fishing zones were found to have a similar impact on biomass but the study noted that most of the no-fishing zones are relatively new (<10 years) and that their performance is likely to improve with time. The study concluded that (a) to be more effective, gear restrictions and no-fishing zones need to be better targeted and more effectively enforced, and (b) the high biomass of remote reefs means they should be protected as a precaution against future exploitation. Remote reefs are probably also important sources of larvae for re-stocking over-exploited reefs elsewhere.

Root causes of destructive small-scale fishing include lack of economic alternatives and dependence on marine resources for food security, lack of information on stocks and the erosion of traditional management systems. Fish stocks may also be reduced by over-fishing from commercial boats, impacting local fisheries. Solutions focus on a communal interest in moving towards more sustainable harvesting that guarantees long-term livelihood security and the survival of the species and ecosystems.

9.1.4 Illegal, unreported and unregulated (IUU) fishing and fisheries by-catch

IUU fishing often takes place on a large scale, with the operators having little interest in the sustainable management of fish stocks in any particular location. Regulation and enforcement are often the most important solutions. IUU fishing is a threat to the region's pelagic fish populations, including sharks and rays. It includes bycatch from trawling for shrimp, prawn and red snapper. Bottom trawling causes significant damage to marine ecosystems and species.

The Arafura Sea Fisheries Management Area (FMA 718), which forms the south-eastern boundary of the seas in Wallacea, is judged to be one of the most heavily exploited regions in Indonesian waters, with industrial scale fishing fleets from Indonesia and other countries such as Taiwan and China using fish trawls, shrimp trawls, gillnets and bottom long lines. Studies in the region (Wagey *et al.* 2009, Purwanto 2011) have identified: (1) a decline in the abundance index for economically important shrimp, as well as decline in average size of individuals; (2) an increase in sailing days of the commercial fishing fleet; and (3) a shift in species composition towards non-economic bycatch and small crabs per catch unit.

Abandoned fishing gear results in marine debris, including 'ghost nets', which are a cause of mortality for many species, including turtles, marine mammals and marine birds, as well as fish and coral.

9.1.5 Hunting and collecting

Customary communities throughout Wallacea have long used animal and plant products as food, medicines and for a variety of household and cultural purposes. As habitats shrink, human populations grow and access to markets opens up, this exploitation has sometimes become unsustainable, leading to the decline and even local extinction of species. The bushmeat trade on Sulawesi, for example, has driven hunting of babirusa and anoa species to unsustainable levels.

In addition, to capture for local consumption, Wallacea has a long history of supplying natural products that are in demand outside the region. The capture and trade of the yellow-crested cockatoo (*Cacatua sulphurea*) is an example of a market-driven process that has reduced a once widespread bird to a handful of viable populations.

Recently, another potential threat from the wildlife trade was identified in the Maluku bioregion: the trapping of songbird species, such as white-eyes and sunbirds, as caged birds. In the Lesser Sundas bioregion, Horsfield's bushlark (*Mirafra javanica*), chestnut-capped thrush (*Geokichla interpres*) and yellow-spectacled heleia (*Heleia wallacei*) are heavily trapped on Sumbawa and Flores, to fulfill the soaring demand from hobbyist and entrants to songbird competitions on Java. This emerging threat, although currently only identified in some areas, could have serious impacts for Wallacea's endemic songbird species in the future.

The drivers of this threat are a lack of awareness on the part of collectors and buyers, and the inability of communities or conservation authorities to enforce regulations.

9.2 Habitat degradation, fragmentation and conversion

9.2.1 Industrial agriculture and forestry

Outside the national forest estate, the expansion of industrial agriculture, predominantly for oil palm but also for sugarcane, coconut, cocoa and rubber, is of increasing importance in Wallacea as a driver of land conversion. Inside the forest estate, industrial timber plantations are supposed to be planted in degraded natural forest areas but, in some cases, directly replace natural forest cover. Both of these land uses result in direct conversion of forest in some cases but also conversion of community agricultural land, displacing food crop production into new, more marginal areas, which are often forested. For both oil palm and timber plantations, the development of large commercial plantations is often associated with smallholder outgrower schemes that may be economically important for local communities. The positive or negative development impact of these schemes is hotly debated and is affected by local circumstances. Although neither of these land uses yet occupies a significant area in Wallacea, oil palm, driven by a shortage of suitable mineral soils in Sumatra and Kalimantan, is showing signs of rapid growth and expansion in Sulawesi, and industrial timber plantations are expanding in all three subregions of Wallacea, as detailed in Chapter 6.

In coastal mangrove areas, a specific and highly damaging form of land conversion is the development of shrimp or fishponds. These ponds can be operated for only a few years before disease loads reduce productivity, at which point they are abandoned and new areas opened. More sustainable models of integrated mangrove and shrimp farming are now available but they are not yet widely adopted.

9.2.2 Expansion and intensification of smallholder agriculture and livestock

Despite urbanization and the growth of industry and services, Indonesian Wallacea's human population of 33.7 million is still overwhelmingly dependent on agriculture (and, for a subset, fisheries) for their livelihoods. In the most densely populated provinces, Sulawesi Utara, Gorontalo, Sulawesi Selatan and Nusa Tenggara Barat, natural vegetation is now confined largely to areas of hilly topography and other remote areas. The lower population density and inaccessibility of parts of Maluku, Sulawesi and some of the smaller islands, means that larger areas of natural habitat remain but, even here, mixed gardens of fruit and timber trees dominate the lower and more accessible parts of the landscape. Some of Wallacea's threatened and endemic species, such as Sangihe Island tarsier (*Tarsius sangirensis*) and Molluccan woodcock (*Scolopax rochussenii*) on Obi (J. Mittermeier pers. comm. 2013), appear to be able to survive relatively well in these semi-natural habitats. For other, more specialist species, any significant change in their natural forest habitat can result in local extinction.

9.2.3 Mining, oil and gas

A legacy of its complex geological history and combination of volcanic and sedimentary minerals, Wallacea has significant mineral and fossil fuel reserves, and is the focus of numerous oil and mineral mining projects. Valuable minerals include the limestone karsts of Sulawesi Selatan, nickel ore deposits on Halmahera and Sulawesi, gold, iron sands, as well as oil and gas. A revision to the mining law in 2020 (Law 3/2020), which was just approved in February 2025, removes the power of district heads to issue licenses for local mining operations and centralized the issuance of all mining permits in the Ministry of Energy and Mineral Resources, although the ministry has the power to delegate this duty to provincial governments. The law also extends the period for which mining licenses are granted and gives license holders greater freedom to transfer rights to other parties. While these provisions offer greater opportunity for mining, there is also renewed emphasis on the need for reclamation and rehabilitation of mined-out lands (HoganLovells 2020).

Based on spatial data from ESDM (2023), a total of 198 mining permits, covering both exploration and operational phases, have been issued within 82 terrestrial KBAs across the Wallacea region of Indonesia. Given that there are 235 terrestrial KBAs in Indonesian Wallacea, this means that around one-third of its most biologically important sites are currently exposed to potential or actual threats from mining activities targeting a range of mineral resources (Table 49).

The local impact of mining is severe. Legal mining is usually large scale, involving the complete removal of natural vegetation from the mine site to access the ore and build infrastructure, processing facilities, roads and ports, and storage ponds for waste. Rehabilitation of mined-out areas is costly and technically difficult, with little chance of ever recovering to the original ecological conditions and biotic communities. In addition, mine waste often contains heavy metals and toxic substances used in processing the ore. These

may be disposed of in coastal waters or lakes, or held in containment ponds that are vulnerable to flooding or leakage and, thus, contamination of aquatic ecosystems. Large-scale mining is, however, easier to monitor and is required to pass through a number of stages of planning and licensing, which offer opportunities to influence the extent, operation and impacts of the mine. Finally, mining requires significant infrastructure, including ports, roads and processing facilities, energy generation plants and water sources.

Table 49: Overlap between mining exploration and operation licenses and KBAs in Indonesian Wallacea

Province	No. of mining licenses issued		Exploration license overlap with KBAs		Operation license overlap with KBAs	
	Units (permits)	Area (ha)	Units (KBA)	Area (ha)	Units (KBA)	Area (ha)
Nusa Tenggara Barat	38	149,115			4	52,291
Nusa Tenggara Timur	126	156,087			11	4,832
Sulawesi Utara	20	253,051	2	10,615	4	36,723
Gorontalo	10	37,316	1	106	3	24,334
Sulawesi Barat	9	16,365			2	2,965
Sulawesi Tengah	202	403,197	4	2,719	13	92,109
Sulawesi Selatan	121	185,306	1	9,998	9	40,143
Sulawesi Tenggara	270	364,911			8	32,055
Maluku Utara	99	913,444			17	178,668
Maluku	9	24,525			3	14,479
Total	**904**	**2,503,317**	**8**	**23,438**	**74**	**478,599**

Source: ESDM (2023).

In addition to licensed, large-scale mines, there are many hundreds or thousands of small, licensed and unlicensed mines operating in the region. Small-scale mining, licensed or unlicensed, is limited in its ability to mobilize large machinery and capital. Therefore, each mine has far less impact on the landscape than large industrial operations. In some cases, however, this is more than made up for by the sheer number of people involved in the mining. Implementation of regulations on safety and environmental protection is minimal. As a result, incidents of pollution of water courses and forest clearance are frequent. No effort is made to rehabilitate abandoned sites. The greatest threat from small-scale mining is its mobility. With relatively simple equipment, miners can penetrate far inside forest areas, establishing a camp and basic facilities that attract increasing numbers of hopeful miners as long as the chance of finding minerals remains high enough. Through these mechanisms, small areas of otherwise remote and untouched forest become totally degraded, for example, within Aketajawe-Lalobata National Park on Halmahera.

Off-shore mining has, to date, been the preserve of the oil and gas industry. However, shallow-sea mining of iron-ore rich sands is now starting around Siau island in Sulawesi Utara and is expected to damage seabed ecosystems in these areas.

Maluku Utara has the largest extent of KBAs threatened by mining operations in the Wallacea region. As of 2023, there were 99 mining licenses issued across the province; this figure had increased to 127 by 2025. These concessions, primarily nickel, gold and iron ore, span ecologically sensitive areas in Halmahera and smaller islands, such as Obi, Gebe,

Pakal, Gee and Mangoli (JATAM 2024). The expansion of open-pit nickel mining and associated deforestation has led to severe habitat loss, water pollution and greenhouse gas emissions, particularly from coal-powered smelters concentrated in central Halmahera and Obi island. As of 2025, Maluku Utara hosts at least eight operational nickel smelters, primarily concentrated in central Halmahera (Weda Bay and Obi island). These smelters are part of a rapidly expanding industrial ecosystem driven by Indonesia's downstreaming policy and global demand for stainless steel and electric vehicle battery materials. Indonesia is now a top global supplier of battery-grade nickel.

In Sulawesi, the provinces of Gorontalo and Sulawesi Utara have emerged as key centers of gold mining activity in Wallacea. The largest gold mining project in the country is being developed in Pahuwato district, Gorontalo. The Pani gold mine, with mineral resources of 6.9 million ounces, is under the preparation (Indonesia Miner 2024). In addition to industrial-scale mining, artisanal and small-scale gold mining is widespread across Gorontalo, including in Pohuwato, Boalemo, Bone Bolango and Gorontalo Utara districts. These activities, often informal and mercury-intensive, have led to significant environmental degradation, including mercury contamination in rivers, fish and human populations.

Sulawesi Utara is geologically rich in copper-gold porphyries and epithermal gold-silver deposits, particularly along the North Sulawesi Arm and Sangihe Arc (Carlile *et al.* 1990). Active exploration and mining operations are currently concentrated in Minahasa, Bolaang Mongondow and Bitung districts, where multiple companies are conducting geological surveys, sampling, and drilling programs (Mitra Jaya Group 2025).

9.2.4 Urbanization and tourist facilities

As a proportion of total land cover, urban settlements and associated infrastructure are still a small fraction of the total land area of Wallacea. However, the footprint of these areas is far greater than the settled area itself, as urban centers extract water and energy (firewood) from surrounding landscapes, and dump waste and pollutants into terrestrial, freshwater and marine ecosystems. Expansion of settlement is partly driven by the creation of new administrative entities, which, in turn, means access to central government budgets for infrastructure, housing and urban development. In 2000, Indonesian Wallacea had 50 districts and seven cities. By 2013, this had more than doubled, to 112 districts and 18 cities, and by 2025 had increased slightly to 155 districts.

9.2.5 Linear infrastructure development

Weak infrastructure and poor connectivity are identified as a key constraint to Wallacea's economic development. In an area with so many islands, this means ports as well as road and rail connections among economic nodes. Chapter 6 noted that infrastructure development in support of accelerated economic development is a strong focus for the government. The location of many of these projects will compete with agricultural land and urban settlement, rather than remote intact habitats but, in specific cases, road corridors and power generation projects impact directly on critical habitats.

9.3 Pollution, erosion and sedimentation

Pollution is a particular problem in aquatic ecosystems. The Lindu, Poso, Matano and Towuti lakes of Sulawesi Tengah are oligotrophic (nutrient poor), and thus support species that

have adapted to clear water and are sensitive to increased turbidity. Eutrophication is caused by fish farms, sewage disposal, and run-off from rice fields, clove and cocoa plantations in the catchment surrounding the lake (Parenti and Soeroto 2003).

Land-based pollution and sedimentation are significant threats to marine ecosystems, causing water turbidity and algal blooms, which reduce the light and nutrients available to coral reefs and seagrass beds. These threats are especially prevalent around larger islands, where larger water catchments and more intensive agriculture and urbanization result in greater intensity of rainwater run-off and pollution.

Marine mining, for aggregates and sand for infrastructure, is a potential source of sediment plumes, which can affect reefs and sea grass beds in the same ways as land-based sedimentation. Shallow-water mining in Wallacea has not reached the levels of Bangka, in western Indonesia, where hundreds of locally produced pontoons work alongside commercial dredgers to extract tin-rich sand (Fagotto 2014).

Disposal of mining waste at sea may be an important threat around mining locations. Nickel mining takes place at a number of locations in Indonesia. In Wallacea, the Batu Hijau mine on Sumbawa disposes waste into the sea, and, in 2020, applications were made by nickel smelting companies to do the same on Obi Island (Halmahera marine corridor) and at Morowali, in Sulawesi Tengah (close to both the Banggai-Togean and Southeast Sulawesi corridors) (Morse 2020). However, in 2021 it was reported that Indonesia would not issue any further licenses for deep sea disposal of mine waste, in response to fears that this will undermine the 'clean' image of batteries produced from nickel. Four high pressure acid leach (HPAL) plants, which process nickel laterite, are reported to be under construction, and the ones in Morowali and Obi are reported to have halted plans for deep-sea tailings disposal, at least temporarily (Reuters 2021a).

Noise pollution is believed to impact marine life, with evidence that marine mammals and fish avoid areas of noise disturbance. Marine mining, oil extraction and especially under-sea seismic surveys are the main sources of noise pollution.

9.4 Invasive species

Wallacea's isolation has resulted in high levels of endemicity but has also have left species susceptible to competition from and predation by invasive alien species. In the ancient lakes of the Poso and Malili regions in Sulawesi Tengah, introduced fish, including common carp (*Cyprinus carpio*) and two species of tilapia (*Oreachromis* spp.), are having a significant impact on the population of many of the endemic and fish, shrimp and gastropod species. This contributes to these lakes having the largest concentration of Critically Endangered species in Wallacea. In addition to the threat of direct predation of the endemic species by these introductions, they may compete with the endemic species for food and habitat, and bring diseases and parasites (Parenti and Soeroto 2003).

There are numerous invasive plant species in Wallacea. Three that are particularly widespread and extreme in their impact are *Chromolaena odorata*, *Prosopis* spp. and *Lantana* spp. (T. Cunningham pers. comm. 2013). *Chromolaena odorata* is an herb that forms dense stands and spreads rapidly in open habitats, such as grasslands, along roads and around settlements in Nusa Tenggara. It is described in more detail for Timor-Leste, below. Mesquite (*Prosopis* spp.), a South American plant introduced for browsing stock,

forms dense thickets and competes with native vegetation for light, water and nutrients (T. Cunningham pers. comm. 2013). Prosopis is a useful source of firewood and food but is highly invasive; the seeds are spread by livestock and can survive in the soil for up to 50 years. The creeping shrub *Lantana* is an American plant now widely introduced through the tropics. It forms dense mats of understory vegetation, eliminating native vegetation, and is a problem for natural vegetation and tree crops. It does not spread under intact forest canopies but is invasive when forests are disturbed.

9.5 Climate change

Climate change interacts with the threats described above in complex ways. Changes in temperature and rainfall patterns will alter the spatial distribution of the climatic envelopes within which a particular species and its habitat can survive, or it may eliminate the envelope altogether, such as in the case of species that are already confined to limited high-altitude distributions. In some cases, sea-level rise will reduce the ecological niche available for coastal mangroves and other intertidal ecosystems, or will bring those ecosystems into competition with human pressures on land use. Climate change impacts on biodiversity are discussed in Chapter 10.

9.6 Indirect causes of threats

9.6.1 Land-use planning

As described in Chapter 7, Indonesia has spatial plans at national, provincial and district level. In law, these plans should be combined with strategic environment assessments (SEAs) and used as a reference for environmental impact assessments, which could lay a framework for sustainable development, including the conservation of biodiversity. In practice, the data to develop the plans are often poor, SEA processes are not conducted with broad, genuine participation, and zonation is not adhered to in the issuing of development and land-use change licenses.

Chapter 7 noted that provincial governments are now required to produce spatial plans (RZWP3K) for the waters up to 12 nautical miles from the coastal. While all provincial governments in Wallacea have now completed their plans, implementation has been patchy.

9.6.2 Development licensing policies and practices

A consequence but also a driver of weak planning control is the prevailing system of land-use licensing, where private property rights are weak outside urban centers, and government takes a major role in determining where and to whom licenses are issued, outside but especially within the forest estate. Despite a commitment to sustainability and more community-oriented management of the forest estate, the slow progress with social forestry licenses contrasts with the large areas licensed for commercial forestry, plantation forestry or released from the forest estate for agricultural plantations. Within the forest estate, MoEF policies emphasize development of industrial timber plantations, with an increase from 6.6 million ha in 2007 to 11.36 million ha in 2020, and a target of 15.38 million ha by 2030 across Indonesia. This development is expected to take place within the national forest estate, where the Ministry of Forestry has the right to issue licenses. Industrial timber plantations are supposed to be developed on land with degraded

forest but such land is often, in fact, community-managed swidden agriculture and small-scale mixed plantations. The distribution and area of timber plantations in Wallacea is discussed further in Chapter 6.

Outside the forest estate, the major large-scale land uses are agricultural commodities (nationally with a strong focus on oil palm but, in Wallacea, cocoa and coffee currently occupy larger areas). Development of commodities may be based on large estates, smallholder growers with a relationship to a buyer or processor, or a system that combined the two. Oil palm in Indonesia is regulated through a system that favors the development of large estates by consolidating land secured from smallholders who 'rent' their land to the company, which then develops the plantation and, once the profits from the land have paid off the company's development costs, return a variable portion of the land to the owner. The social consequences of this have been mixed, with some successful schemes, and others where smallholders have remained indebted and impoverished. Widely observed consequences include the loss of land for producing local staple food crops, which encourages smallholders (particularly those who do well from the oil palm and have capital to invest) to open new areas of land to fulfill their immediate food needs.

The system of licensing marine areas for exploitation is in flux, as noted in Chapter 7. One of the key problems faced by communities wishing to manage their resources sustainably is that it is difficult for them to legally assert their ownership and exclude other actors from harvesting the same resources. A previous law (Law 27/2007), which allowed for communities and other stakeholders to seek recognition of their rights over marine resources, was struck down by the constitutional court, and subsequent regulations have only created licensing mechanisms for a narrow range of uses. There is still no clear pathway for communities to assert control over fishing rights or other rights over natural resources, although a number of more recent laws have created opportunities (see Section 7.1.11).

9.6.3 Weak institutions for the management of protected areas and enforcement of conservation regulations

A phenomenon seen widely in Indonesia is smallholder encroachment on forest reserves, which is backed, politically and financially, by individuals with connections in the business, security and political institutions, who thus have a degree of immunity from prosecution. The process exploits the land hunger and economic ambition of smallholders, many of whom may travel considerable distance, even to other islands, to take advantage of the opportunity to secure land. Lethargic reactions by the institutions responsible for forest-reserve management allow these encroachments to gain a toehold, and then to develop rapidly to a point where thousands of families and hectares of land are involved. Such large groups of people become a significant local political force, and, with the backing of their benefactor, may succeed in securing legitimacy through the issuing of identity cards and securing access to local health and education services. At this point, enforcement through the removal of people becomes politically and physically almost impossible. These situations have rarely been effectively managed and often become a chronic source of tension between forest authorities (or protected-area managers) and the affected communities. A subset of these land invasions is motivated by (or sometimes justified by) the land-rights issues described above, with customary claims over the land concerned used as a justification for occupation.

Chapter 7 noted the rapid expansion of marine protected areas in Wallacea in the last five years but also that many of them lack any effective monitoring or patrolling. Agencies under both the Ministry of Fisheries and Marine Affairs, and the Ministry of Environment and Forestry lack adequate resources, with operational funding to cover the high recurrent costs of patrols and field work often particularly limited. Similar problems apply to the provincial agencies charged with managing MPAs, a situation made more complex by a legal change (Law No 23/2014, only enforced since 2016) that moved responsibility for protected area management from districts to provinces.

Some agencies have responded creatively to these constraints, collaborating with local communities and private sector interests. These approaches are increasingly recognized and valued by the ministries responsible.

9.7 Results of analysis of threats to KBAs

During the preparation of the 2014 ecosystem profile, information was gathered from stakeholders at workshops throughout Wallacea on threats to KBAs. There has been no opportunity to repeat this exercise since, and so the analysis is presented here, with the note that it may be out of date for some KBAs.

This section combines data on KBAs in Indonesia and Timor-Leste unless specifically stated. Data on threats to KBAs come from two sources:

- Data on threats to 197 KBAs (148 terrestrial and 49 marine) were gathered from stakeholders at seven stakeholder consultation workshops held in 2014. KBAs had between one and 12 threats (mean of 3.19).
- Data on land-use change and forest loss in and around all KBAs were obtained by comparing Ministry of Forestry land cover maps for 2000 and 2011 (for Indonesia only).

9.7.1 Frequency of threats to KBAs

Threats were divided into 12 categories. The 197 KBAs assessed experienced between one and six different categories of threat (mean of 2.6). For marine KBAs, the most prevalent problem by far was unsustainable local fishing, reported for 73 percent of marine KBAs. Hunting and collection of coral and other biota were threats at one-third of the marine KBAs. Land-based threats were also significant, with mining a problem at one-third of the marine KBAs, pollution and sedimentation at over a quarter of the sites, and settlement and tourism development reported to be a threat to just under a quarter (Table 50).

Threats at the 148 sampled terrestrial KBAs were dominated by local or small-scale exploitation, with hunting and collecting, smallholder agriculture and livestock grazing, and small-scale logging each reported as a threat at about half of the KBAs. Among large-scale resource exploitation activities, only mining was at a similar level, reported as a threat at 45 percent of terrestrial KBAs. Pollution, urbanization, industrial agriculture and forestry plantations each affected just under a fifth of all KBAs. Commercial logging, infrastructure development and invasive species each affected less than 10 percent of terrestrial KBAs.

Table 50: Prevalence of threats at 148 terrestrial and 49 marine KBAs according to stakeholder consultations in 2014

Threat category	Prevalence in KBAs (percent of KBAs assessed where threats in this category were reported)		
	Terrestrial	Marine	Combined
Hunting and collecting	53	36	49
Mining, oil and gas production	45	31	41
Local agriculture and livestock	46	16	39
Small-scale logging	43	12	35
Unsustainable small-scale fishing	12	74	27
Expansion of urban areas and tourist facilities	18	22	19
Pollution and sedimentation	14	29	18
Industrial agriculture and forestry	13	-	10
Linear infrastructure development	8	4	7
Unsustainable industrial logging	7	2	6
Other threats	1	4	2
Invasive species	2	-	2

Table 51: Prevalence of threats at terrestrial and marine KBAs per subregion

Threat	Prevalence in KBAs (% of KBAs assessed where threats in this category were reported)		
	Maluku	Sulawesi	Lesser Sundas
Hunting and collecting	51	40	58
Industrial agriculture and forestry	—	23	3
Unsustainable industrial logging	9	7	1
Linear infrastructure development	2	12	6
Invasive species	—	3	1
Local agriculture and livestock	27	32	57
Unsustainable small-scale fishing	31	25	28
Mining, energy, oil and gas	40	49	33
Other threats	2	3	1
Pollution and sedimentation	20	19	16
Small-scale logging	49	30	29
Expansion of urban areas and tourist facilities	4	29	22
Overall	**55**	**73**	**69**

In Sulawesi, mining was the most frequently reported threat, present at 49 percent of KBAs, with community/smallholder agricultural, hunting and logging present at between 30 and 40 percent of sites. By contrast, the most frequently reported threat in the Lesser Sundas and Maluku was hunting and collecting, recorded at 58 percent of KBAs in the Lesser Sundas and 51 percent in Maluku. Local agriculture and livestock were reported almost as frequently as hunting in the Lesser Sundas: at 57 percent of KBAs. In Maluku, small-scale

logging was the second most frequent threat, recorded at 49 percent of KBAs. Urbanization and tourism development was noted in Sulawesi and Lesser Sundas but it was not reported as a problem from Maluku. Industrial agricultural and forestry plantations, responsible for massive deforestation in western Indonesia, was reported as a threat to no KBAs in Maluku and only 3 percent in the Lesser Sundas but at nearly a quarter (23 percent) of KBAs in Sulawesi. Infrastructure development was virtually absent as a threat to the Maluku KBAs (2 percent), while it affected 6 percent of KBAs in the Lesser Sundas and 12 percent of those in Sulawesi. Table 51 summarizes the differences in prevalence of threats among bioregions.

9.7.2 Severity of threats

The severity or impact of threats was estimated using the methodology described in Langhammer *et al.* (2007), with each threat at each site scored on the basis of its timing (past, present, future), scope (proportion of the KBA affected) and severity (degree of degradation caused to the areas of the KBA affected). Adequate information was available from stakeholders to assess the impact scores for 109 KBAs (although threats were identified for 197 KBAs, information to score the impact of the threat was not available for all of them). In 22 cases, the threats were considered to have happened in the past and no longer to constitute a direct threat to the site. These threat-site pair scores were excluded from the rest of the analysis, leaving 87 KBAs in the analysis.

Of the 87 KBAs assessed, 268 of the reported threats were current and three were anticipated in the future (all of them from mining). This reflects a tendency of workshop participants to focus on existing problems, rather than predict the (often, indeed, uncertain) future developments at a site.

Table 52: Average threat impact scores for each category of threat

Threat	Timing (a)	Scope (b)	Severity (c)	Overall impact score (a+b+c)
Industrial agriculture and forestry	1	1.2	1.2	3.4
Mining, oil and gas production	1.1	1.0	1.0	3.1
Unsustainable industrial logging	1	1.0	1.0	3.0
Unsustainable small-scale fishing	1	0.9	1.1	3.0
Hunting and collecting	1	0.8	1.0	2.8
Small-scale logging	1	0.8	0.9	2.6
Expansion of urban areas and tourism facilities	1	0.8	0.8	2.6
Pollution and sedimentation	1	0.8	0.7	2.5
Linear infrastructure development	1	0.5	0.5	2.0
Local agriculture and livestock	1	0.4	0.6	2.0
Invasive species	1	—	—	1.0
Other threats	1	—	—	1.0

Notes: Averages were calculated from the scores attributed to 268 threats reported for 197 KBAs by participants of eight consultations in September 2013. Scoring for 'timing' was allocated 1 point for "presently occurring", with mining allocated 1.1 because there were an additional three threats reported as "future-in the next 4 years". Scoring for "scope" and "severity" follows Langhammer *et al.* (2007), on a scale of 0 = insignificant, to 4 = whole KBA or very severe degradation.

Scores were combined per threat category to give an indication of the severity of the threat from each category. Industrial agricultural and forest plantation development scored highest because they take place on a large scale and result in near-complete conversion of natural habitats. Mining and industrial logging are close behind in terms of both scale and severity of impact: a reflection of the failure of logging to maintain sustainable management. Of local uses, unsustainable local fishing also emerges as having a broad scope and high impact because of the large number of people involved and the destructive methods used (bombing, poisoning, etc.). Other local community-based threats (particularly the most frequently recorded one: expansion of smallholder agriculture and livestock) have considerably less impact on KBAs because of their smaller scale and more limited capacity to convert natural habitats. Table 52 summarizes the scores.

9.7.3 Combined threat scores

Combining the data on the frequency of threats from the workshops and the average impact scores for each category of threats gives an impression of the overall importance of each for the conservation of KBAs. Figures 15 to 17 and Table 53 show the threats, aligned along axes of severity and frequency.

Table 53: Key to the threat categories in Figures 15, 16, and 17

Threat category	Abbreviation in figures
Expansion and intensification of smallholder agriculture and livestock	Local Agric
Hunting and collecting	Hunt + collect
Industrial Agriculture and Forestry	Kebun
Invasive Species	Invasive species
Linear Infrastructure Development: roads, ports, airports	Infrastructure
Mining, energy, oil and gas	Mining
Other threats	Other
Pollution, erosion and sedimentation	Pollution
Small-scale logging	Local logging
Unsustainable Industrial Logging	HPH
Unsustainable small-scale fishing	Local fishing
Urbanization and tourist facilities	Urban + tour

Mining and oil exploration emerges as the most frequent and most severe threat to KBAs, reported at 81 (41 percent) of the 197 KBAs that were assessed in the threat analysis. Thirty-six of these are in Sulawesi, 23 in the Lesser Sundas and 22 in Maluku. Mining was reported as a threat in 15 marine KBAs, where activities include removal of sand and rock, and dredging of sea floor iron sands. Nickel mining, and disposal of tailings, is a particular threat to the freshwater lakes in Sulawesi Tengah (Lake Mahalona, Towuti and Matano (KBA Feruhumpenai–Matano)), which together contain 43 globally threatened species of fish, shrimps and crabs. This complex of lakes and rivers with its forested watersheds constitutes the highest concentration of globally threatened species in Wallacea.

Figure 15. Frequency versus severity of threats at 197 KBAs

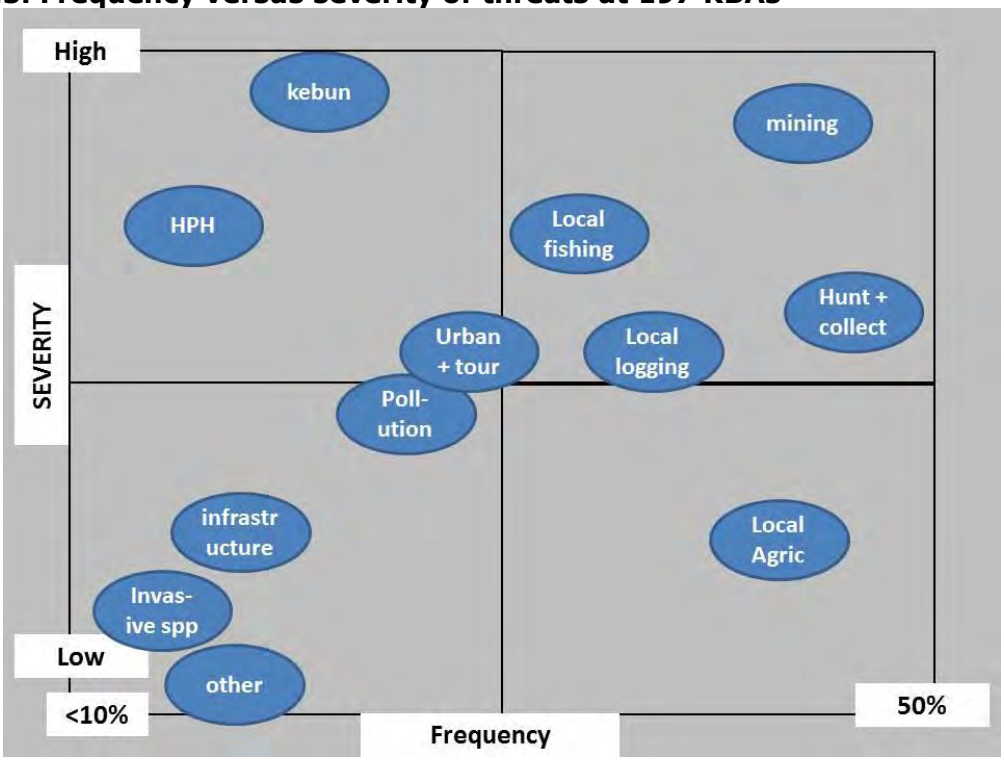


Figure 16. Frequency versus severity of threats at 148 terrestrial KBAs

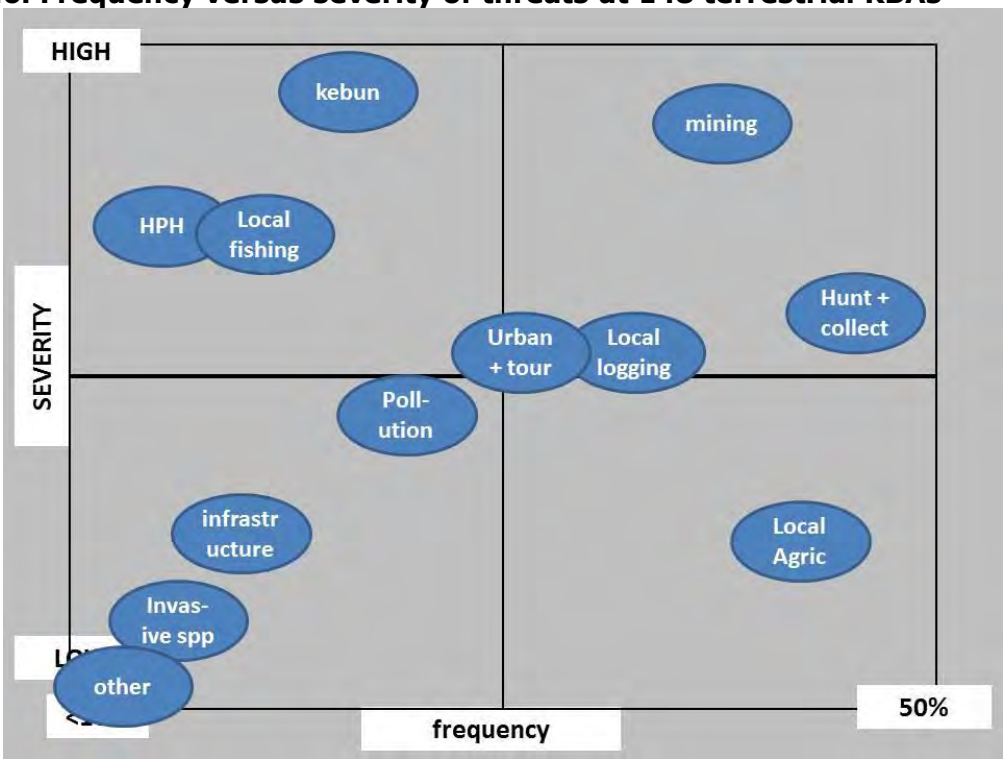
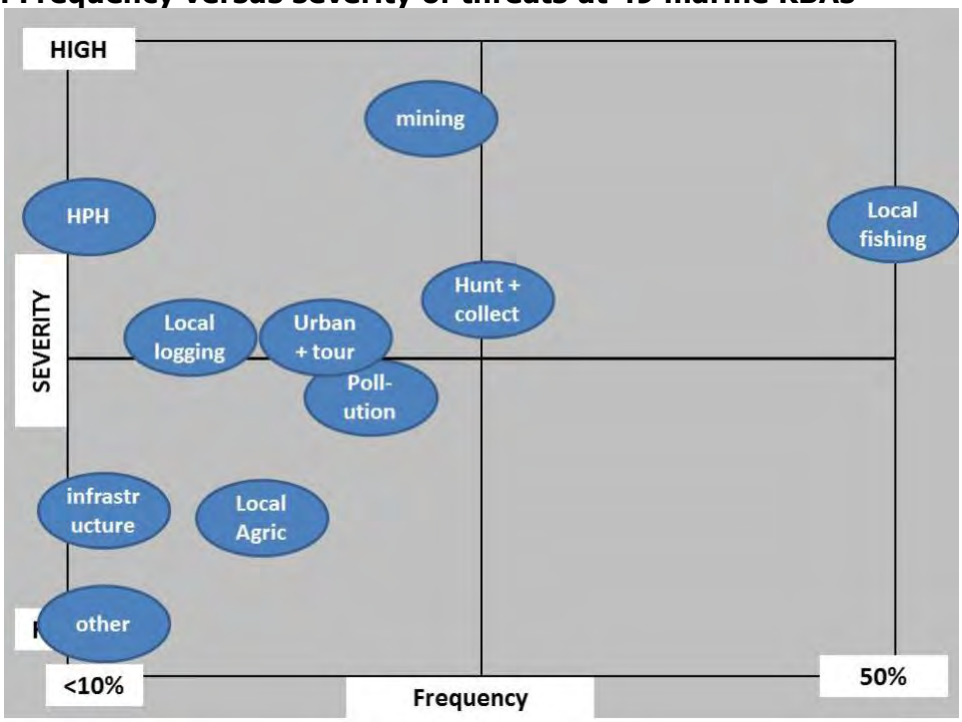


Figure 17. Frequency versus severity of threats at 49 marine KBAs



Data on the type and legality of mining are incomplete but those that are available show that gold is the most commonly mined product, and that a third or more of cases of gold mining are illegal. Nickel is the second most common product of mining but, here, exploitation is entirely by licensed companies. Overall, nearly equal numbers of mining operations were reported to be company-owned or illegal but the high number of "unknowns" in these categories makes it difficult to be certain. Legal and illegal mining clearly differ in the nature of the threat they pose to KBAs.

9.7.4 Forest loss in Indonesian terrestrial KBAs: comparison of land cover mapping from 2011 and 2021

Land cover data for 235 terrestrial KBAs in Indonesian Wallacea was obtained from the MoEF statistics land-cover maps for 2011 and 2021. Sixteen of these KBAs had no forest in 2011 and so were excluded from the analysis of forest loss and deforestation. For the remaining 219 KBAs, land-cover classes were grouped into 'forest' and 'non-forest'.

Net forest loss was calculated by comparing the extent of forest cover in 2021 with that in 2011. For each KBA, forest loss or gain was assessed by identifying areas that were forested in 2011 and determining whether they were deforested or remained forested by 2021.

In 2011, the total forest area across the 219 KBAs was approximately 6.44 million ha. By 2021, this had declined by 175,716 ha to 6.27 million ha, suggesting an average annual loss of about 17,572 ha, equivalent to 0.27 percent per year.

Analysis of individual KBAs revealed that 134 KBAs, representing 61 percent of the forested KBAs, experienced net forest loss between 2011 and 2021. Seventy-eight of these KBAs (58 percent) recorded forest loss exceeding 500 ha, with six losing more than 10,000 ha. These top six KBAs that lost the largest absolute area of forest cover are:

- IDN101 Mekongga (Sulawesi Tenggara).
- IDN064 Pasoso (Sulawesi Tengah).
- IDN057 Buol-Tolitoli (Gorontalo).
- IDN231 Gunung Rinjani (Nusa Tenggara Barat).
- IDN341 Gunung Mutis (Nusa Tenggara Timur).
- IDN313 Lembata (Nusa Tenggara Timur).

In contrast, the other 85 KBAs either retained their forest cover or recorded a net gain in forest area during the same period. Almost half of these KBAs (46 percent) recorded forest gain exceeding 500 ha. Seven of these KBAs gained more than 5,000 ha during the period 2011–2021:

- IDN104 Rawa Aopa Watumohai (Sulawesi Tenggara).
- IDN106 Nipa-nipa (Sulawesi Tenggara).
- IDN137 Komara (Sulawesi Selatan).
- IDN358 Nanggala (Sulawesi Selatan).
- IDN244 Pulau Moyo (Nusa Tenggara Barat).
- IDN289 Gapong (Nusa Tenggara Timur).
- IDN284 Mbeliling-Tanjung Kerita Mese (Nusa Tenggara Timur).

The five top corridors in terms of net forest loss during 2011-2021 were: Central Sulawesi (72,139 ha); Timor-Wetar (36,423 ha); North Sulawesi (25,635 ha); Lombok-Sumbawa (21,964 ha); and Flores Forest (21,013 ha). These corridors also experienced the highest deforestation during the period (see Section 9.7.5).

The three corridors with the largest net forest gain during the period are: Seram-Buru (3,201 ha); Sumba (4,063 ha); and South Sulawesi (8,965 ha).

9.7.5 Deforestation in KBAs

In addition to net forest loss, actual area deforested and percentage deforestation were also considered in the analysis. The latter allows comparison of rates of change among KBAs without introducing bias due to the size of the KBA (1,000 ha of deforestation will be a much higher percentage of a 10,000-ha KBA than a KBA covering 1 million ha).

Between 2011 and 2021, total deforestation across the 219 KBAs that had forest in 2011 was calculated at 397,537 ha, representing an average annual loss of 39,754 ha or 0.6 percent per year.

Thirty-five KBAs experienced severe deforestation, losing at least 30 percent of their 2011 forest cover by 2021. Among these, IDN064 Pasoso (Sulawesi Tengah), IDN313 Lembata (Nusa Tenggara Timur) and IDN341 Gunung Mutis (Nusa Tenggara Timur), each experienced deforestation exceeding 10,000 ha during the period. They were also all identified as having net forest loss greater than 10,000 ha.

One hundred and thirty-four KBAs (61 percent of those analyzed), experienced deforestation ranging from 1 to 27 percent of their 2011 forest cover. The other KBAs recorded less than 1 percent deforestation between 2011 and 2021, with some experiencing no deforestation at all, indicating areas of exceptional stability.

The five corridors with the highest absolute deforestation during the period were Central Sulawesi (123,869 ha), Timor-Wetar (50,815 ha), Flores (48,799 ha), Lombok-Sumbawa (45,323 ha) and North Sulawesi (33,713 ha).

9.8 Analysis of threats to marine corridors in Wallacea

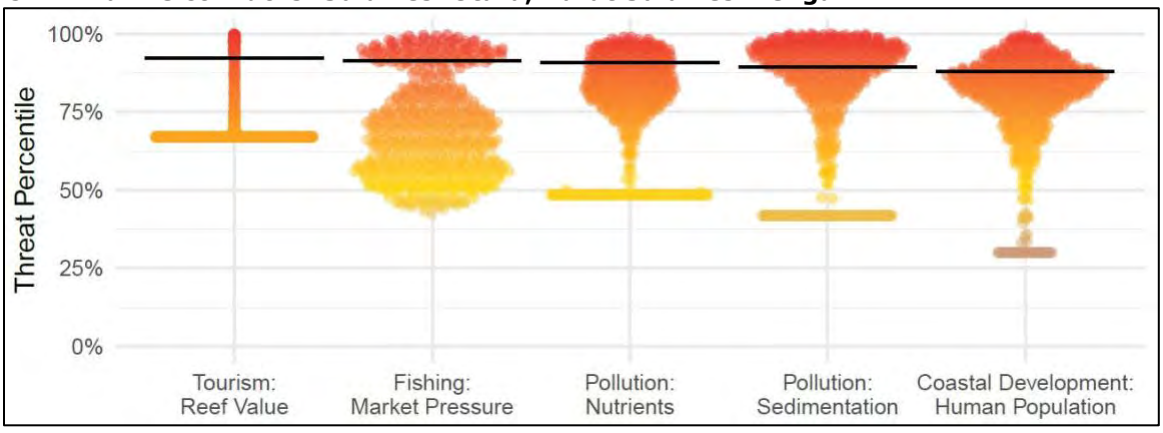
A recent analysis by Darling *et al.* (2020) used global datasets and modelling to predict the relative intensity of threats to reefs, including fishing/market pressure, tourism pressure, sedimentation, nutrient pollution, and coastal development. Figure 18 shows the predicted pressure from each of six threats in eight of the reef bioclimatic units (BCU) identified by Beyer *et al.* (2018). These broadly coincide with some of the marine corridors identified for CEPF support and, thus, are useful indicators of the pressure these reefs are under.

In the figures below, each orange dot represents a 5 square kilometer pixel from the reef. The position of the dot shows the modelled level of threat relative to the global level of threat for that type of pressure. The black line shows the average for the reef.

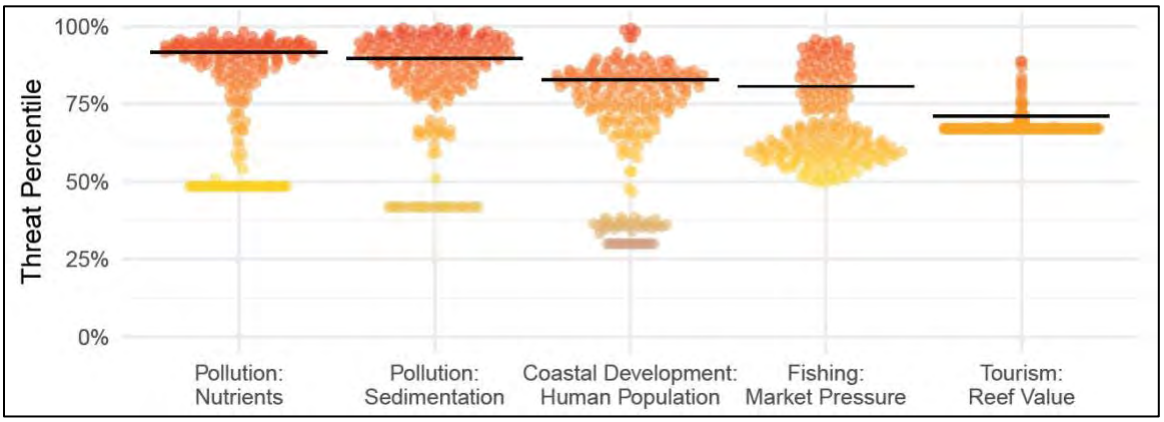
The figures show the overall greater level of pressure on reefs around large islands: all the pressures in North Sulawesi, Central Sulawesi and Gulf of Tomini are on average higher than the value for 75 percent of the world reefs (with one exception: the slightly lower value for tourism in the Gulf of Tomini). Halmahera also has a value greater than 75 percent for three threats. By contrast, none of the threats at Sabalana and Taka Bonarate exceed the 75th percentile.

Figure 18. Threat modelling for selected reefs in Wallacea

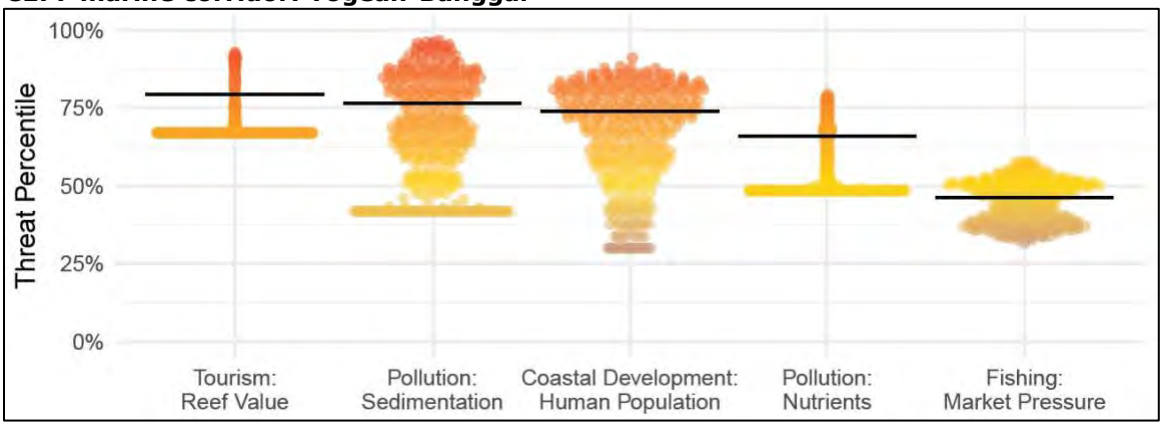
BCU: North Sulawesi
CEPF marine corridors: Sulawesi Utara, Barat Sulawesi Tengah



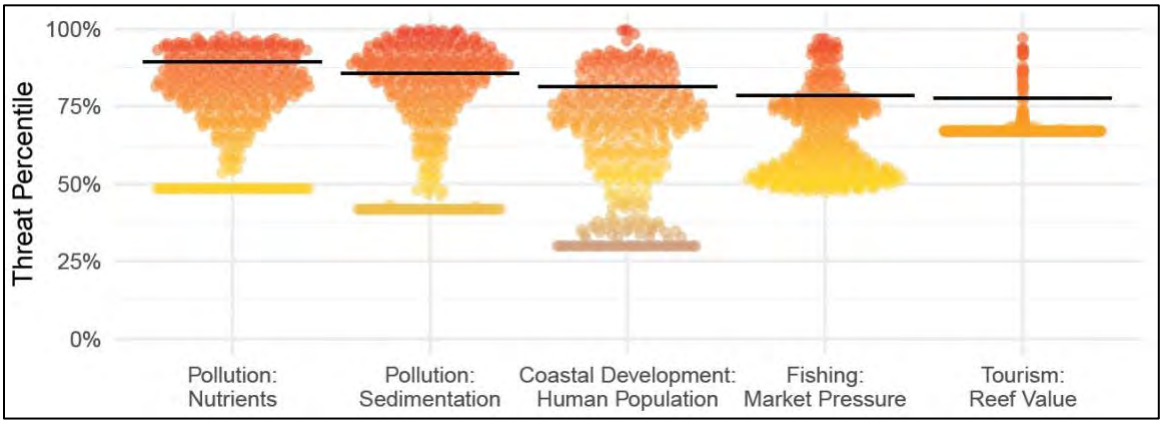
BCU: Gulf of Tomini
CEPF marine corridor: none



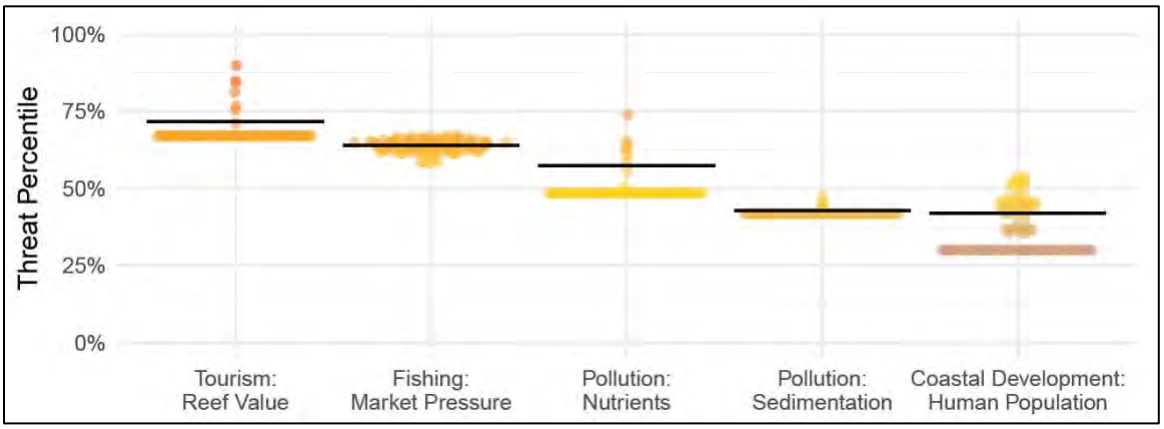
BCU: Banggai to Gulf of Tomini
CEPF marine corridor: Togean-Banggai



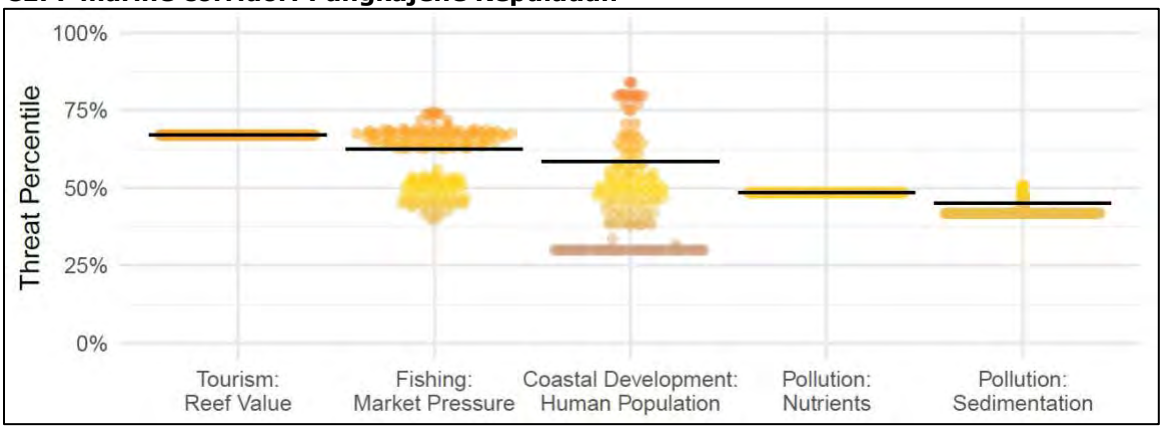
BCU: Central Sulawesi
CEPF marine corridor: Southeast Sulawesi



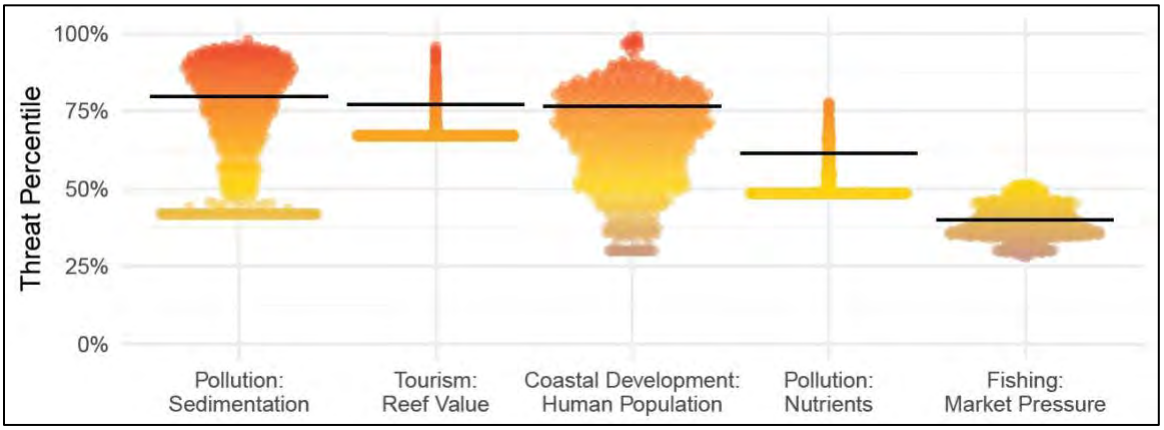
BCU: Taka Bonarate
CEPF marine corridor: South Sulawesi



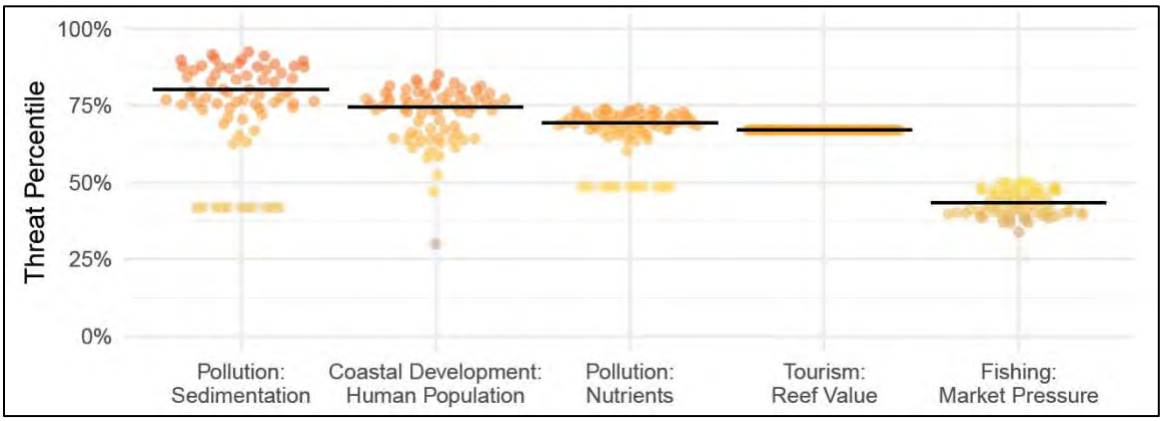
BCU: Sabalana
CEPF marine corridor: Pangkajene Kepulauan



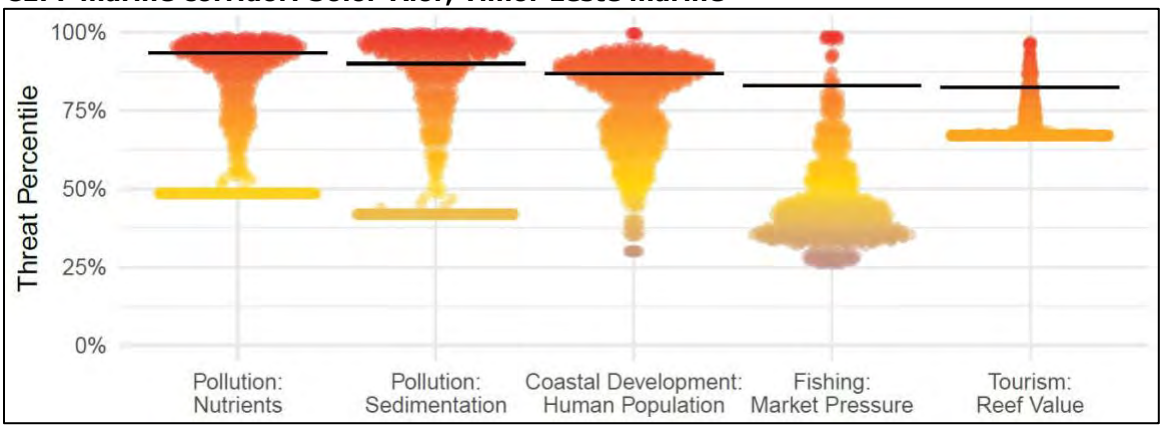
BCU: Halmahera
CEPF marine corridor: Halmahera



BCU: Obi
CEPF marine corridor: Halmahera



BCU: Flore/Timor
CEPF marine corridor: Solor-Alor, Timor Leste marine



Source: Darling *et al.* (2020).

The large water catchments, dense population and intensive agriculture of much of Sulawesi result in high predicted levels of sedimentation, nutrient pollution and coastal development for the reefs fringing the main island. Pollution and sedimentation are also the highest-rated threats for Flores/Timor, perhaps as a function of topography and a drier, more seasonal climate rather than intense agricultural development. Halmahera experiences less pressure because the island is smaller with lower population densities and less agriculture, and the small islands of Taka Bonarate and Sabalana face the least pressure of all.

Fishing pressure is predicted by the size of surrounding population centers and time of travel to the site. North Sulawesi is expected to experience intense pressure, with Central Sulawesi and Gulf of Tomini only slightly less. Fishing and tourism are the two highest pressures for Taka Bonarate and Sabalana, with the lowest fishing pressure around the more remote islands of Obi and Halmahera.

Tourism pressure is concentrated in a small number of pixels in most sites, with highest pressure in North Sulawesi, which has several international marine tourism destinations, and least pressure around the inaccessible islands of Obi and Sabalana. The relatively high

score for Halmahera includes the impact of Raja Ampat in Papua, a major dive-tourism destination, which is included in the BCU.

Note that these modelled threats rank reefs in comparison to the modelled global intensity of the same threat, and do not allow comparison of the impact of different threats at a site. Further evidence of the threats to Wallacea marine ecosystems comes from the threats reported by stakeholders for individual KBAs, during the preparation of the 2014 ecosystem profile, where it was found that:

- The most prevalent problem by far was unsustainable local fishing, reported for 73 percent of marine KBAs.
- Hunting and collection of coral and other biota were threats at one-third of marine KBAs.
- Land-based threats were also significant, with mining a problem at one-third of marine KBAs, pollution and sedimentation at over a quarter of them, and settlement and tourism development at just under a quarter.

The contrast between the large-scale analysis and specific detail from a set of KBAs underscores the importance of understanding specific local threats and their drivers. Local but extreme impacts, such as sea-floor mining or mining tailing disposal, are not captured by the BCU-level analysis but may have extremely severe impacts on individual KBAs.

10. CLIMATE CHANGE ASSESSMENT

Climate change poses a significant risk to biodiversity and ecosystems, with the habitats of many species moving polewards or upwards from their current locations, and the risk of extinction increasing for many species that are already vulnerable. At the same time, ecosystems play a key role in the fluxes of greenhouse gases, with more than 50 percent of anthropogenic CO_2 emissions absorbed through photosynthesis and dissolved in the oceans (Pörtner *et al.* 2021). The changes in land use that drive biodiversity loss also result in increased CO_2 emissions, and agriculture, forestry and other land use (AFOLU) is a major contributor to anthropogenic greenhouse gas emissions. Maintaining and enhancing the role of ecosystems in mitigating the impacts of climate change is an increasingly urgent justification for their conservation.

The Asian Development Bank (ADB) has projected that, by the end of this century, climate change will cost Indonesia between 2.5 and 7 percent of its GDP (ADB 2009). Losses to the agriculture and fisheries sectors will account for the vast majority of that loss, while increased climate-related disasters will contribute the remainder. The greatest impacts will fall on the poorest people, especially those who live in areas susceptible to drought, flooding or landslides and who are dependent on climate-sensitive livelihoods, particularly in agriculture and fisheries. These findings have particular resonance for Wallacea, given its rich and unique biodiversity, and the vulnerability of the human population to reduction in availability of wild-caught food (especially marine fisheries), changing weather patterns and sea level rise. A warming climate will bring more intense rainfall, and sea-level rise will threaten food security, health, water resources, farming and coastal livelihoods (World Bank 2009).

This chapter uses climate-modeling software and data from the meteorology unit of Bandung Technical University (ITB) to develop climate projections for Wallacea until 2033 and their implications for biodiversity in Wallacea.

10.1 Current and projected climate patterns in Wallacea

The Wallacea region generally has a wet tropical climate influenced by west and east monsoon winds. From November to May, the wind blows from the northwest, bringing moisture and rain into this part of Indonesia; from June to October the wind blows from the southeast, bringing generally dry conditions and little water vapor. Temperatures in the lowlands range from 23 to 28°C throughout the year and are highest during the rainy season, when water vapor in the atmosphere traps long-wave energy reflected from the Earth.

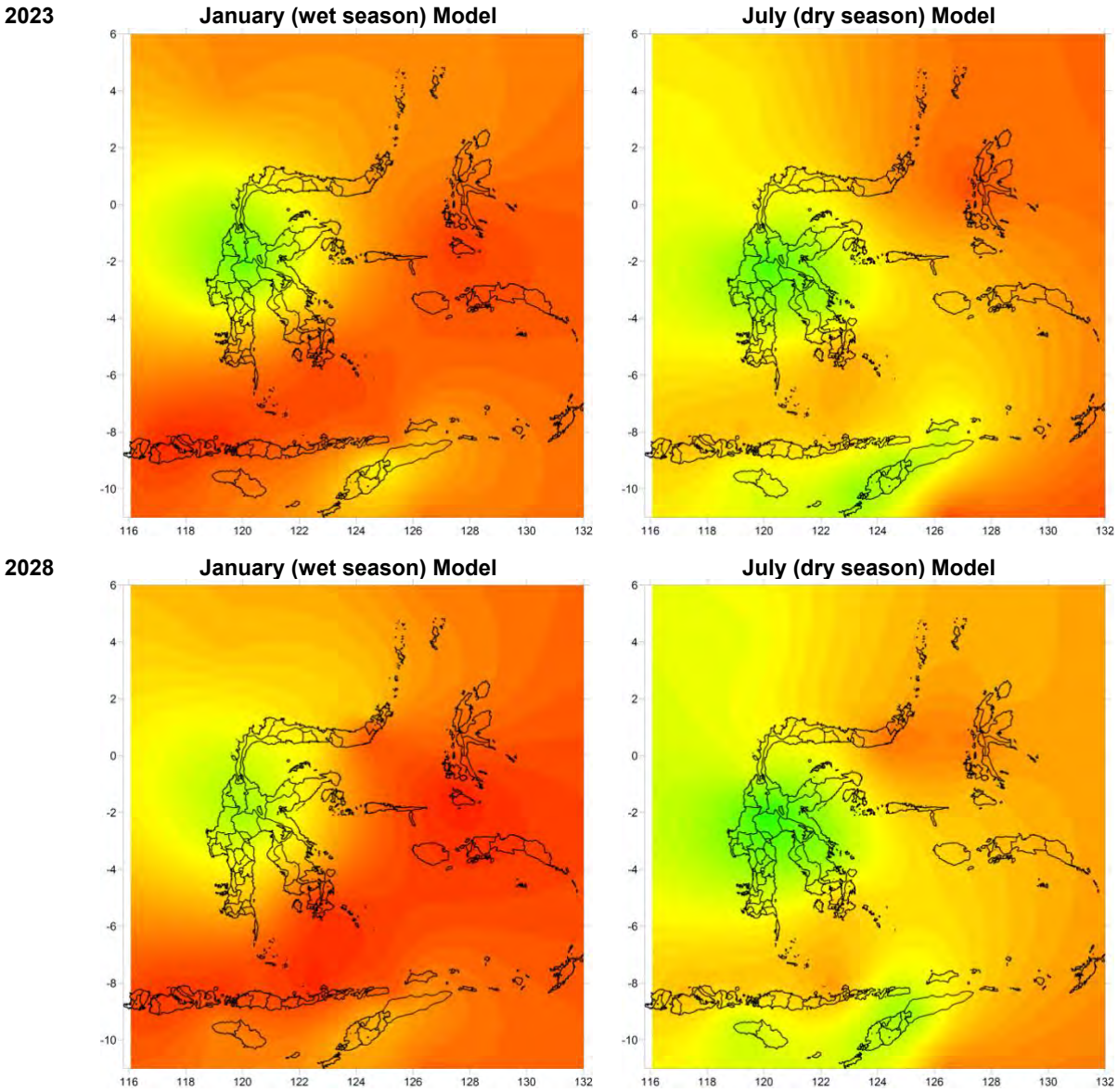
Rainfall in the region averages 1,600 millimeters a year but also varies greatly, from more than 7,000 millimeters a year in some places in Sulawesi Utara and Maluku Utara to about 500 millimeters a year in the area of Palu, Sulawesi Tengah.

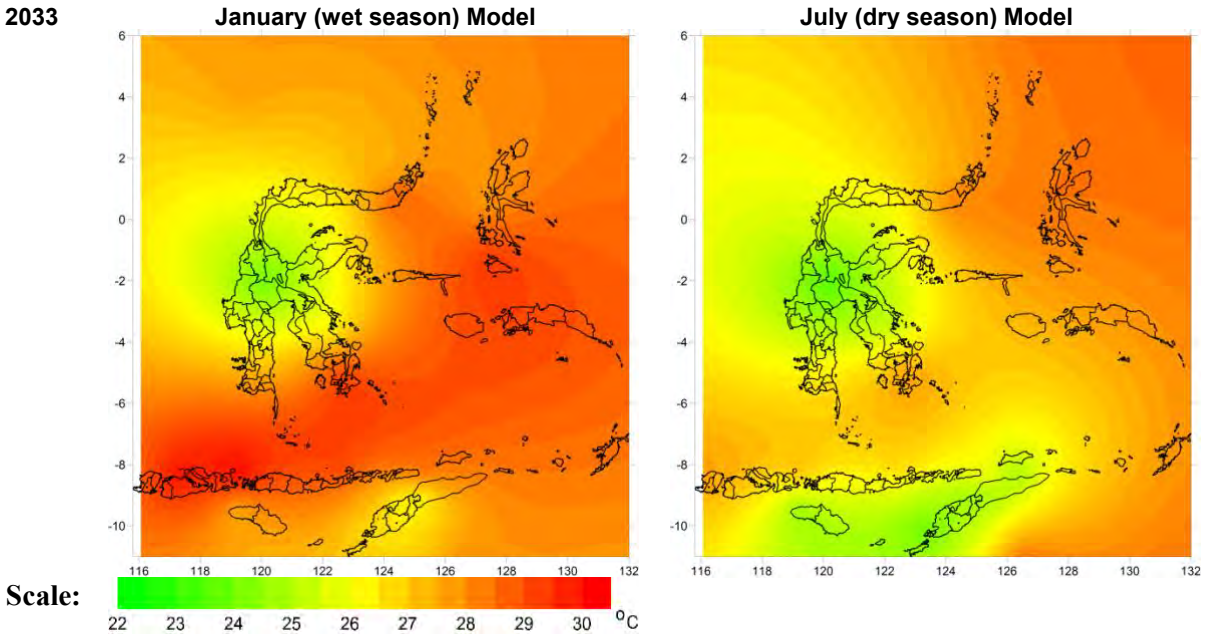
10.1.1 Modeling climate change

Climate modeling provides projections of the two main climatic parameters that directly or indirectly impact on the environment and biodiversity: temperature and precipitation.

Projections are made in five-year intervals up to 2033 for the two main seasons: the rainy season, represented by January; and the dry season represented by July.

Figure 19. Temperature projections for Wallacea





The climate model for temperature shows that, in 2023, in the wet season, much of Wallacea experiences uniformly high temperatures, with lower temperatures in central and western Sulawesi and Timor; this pattern remains broadly the same in 2033 (Figure 19). In the dry season, by contrast, the model shows that, in 2023, there are low temperatures across all of Wallacea with the exception of Halmahera, the islands of northern Sulawesi, Tanimbar and Lombok/Sumbawa. The model suggests that there will be an increase in temperatures across most of the region, with eastern Sulawesi, Maluku and most of the Lesser Sundas experiencing increasingly hot, dry seasons.

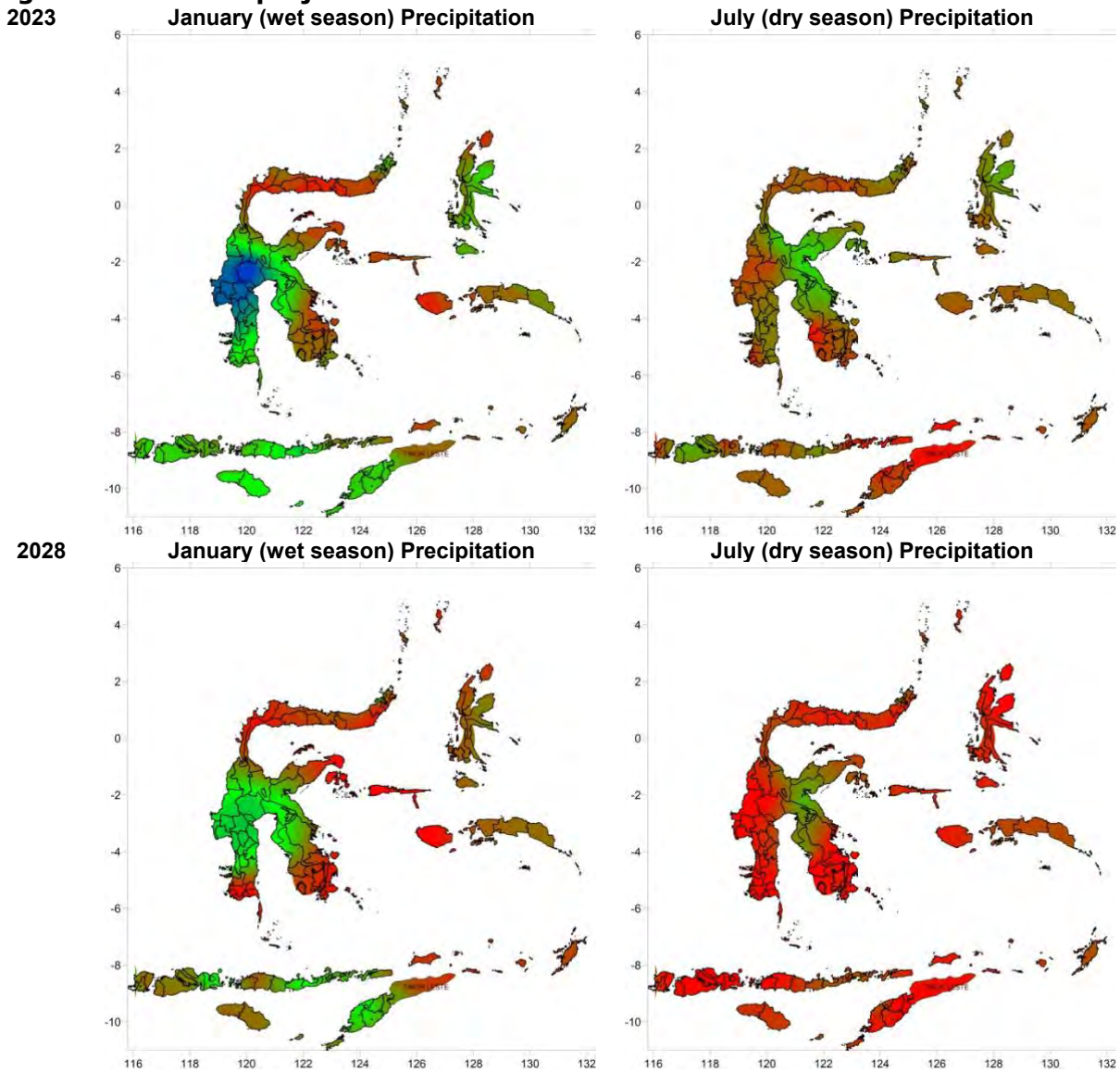
In 2023, in the wet season, southern and central Sulawesi are the wettest areas, with Halmahera, Seram and the islands of the Lesser Sundas less wet (Figure 20). Northern Sulawesi, Buru, Timor-Leste and the islands of the Banda Arc have the lowest rainfall during this season. The projections from the climate model show intensification of wet season rainfall in the wet areas, primarily central Sulawesi. They also show a decrease in rainfall in the drier areas, so that, by 2033, there are extreme differences between the high rainfall in central Sulawesi and the markedly reduced rainfall across Maluku, Lesser Sundas and the northern, eastern and southern extremes of Sulawesi. For the dry season, the model suggests that there will be an increase in rainfall in northern and eastern parts of Sulawesi and Halmahera.

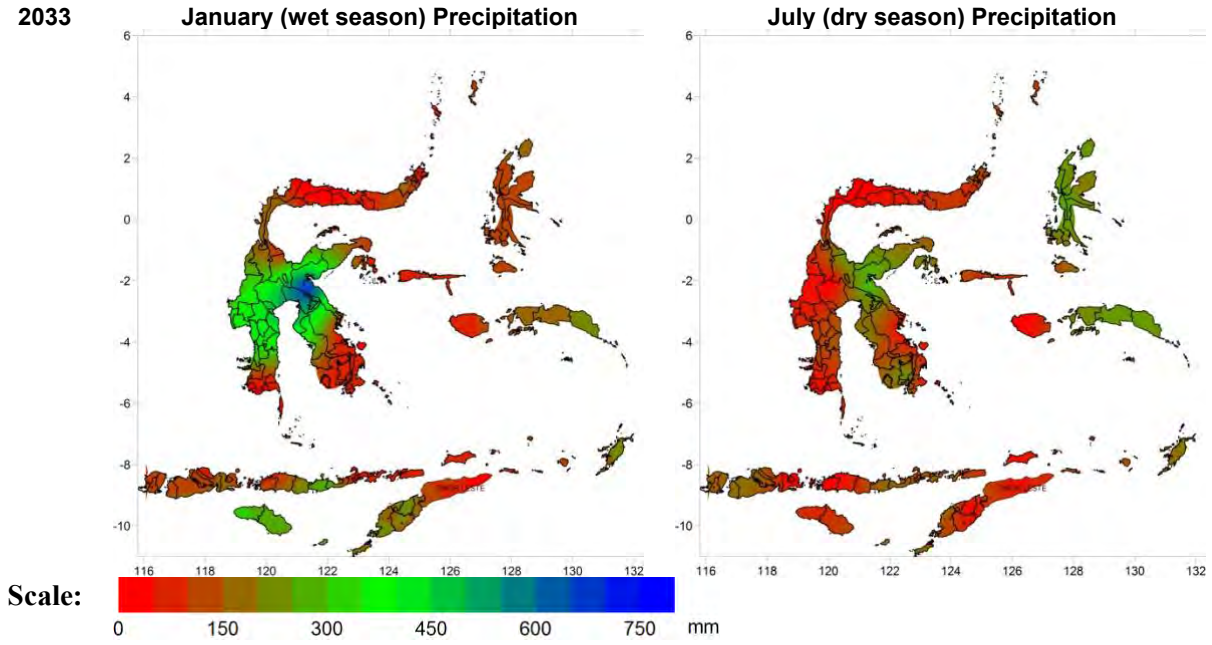
In summary, the climate model predicts that wet season temperatures will remain constant while rainfall will become more differentiated, increasing in the areas that already have higher rainfall, and decreasing in areas that are already dry. This has serious implications for agriculture, forests and fire management in areas such as the Lesser Sundas, where the climate is already highly seasonal. The model predicts that, in the dry season, temperatures will increase in the Lesser Sundas, northern Maluku and eastern Sulawesi. The impacts on vegetation and agriculture may be somewhat offset by a predicted increase in rainfall for eastern Sulawesi and northern Maluku but the Lesser Sundas are predicted to experience

increased temperatures and stable or decreased rainfall, which means that evapotranspiration will be higher and available water for plant growth more limited.

The model appears to generally agree with the review of Barnett *et al.* (2007) of nine climate models for Timor-Leste, which reported predictions of 20 to 80 percent decreases in rainfall by 2070, increased temperature and greater variability unpredictability. The authors noted, however, that "uncertainties are particularly large for small and mountainous islands like East Timor where higher spatial resolution models are required. This is because the topography and land–sea interface of a small island cannot be represented in a global climate model" (Barnett *et al.* 2007, p.373).

Figure 20. Rainfall projections for Wallacea





10.2 Impacts of climate change on biodiversity

Climate change is known to have important impacts on marine ecosystems, with coral reefs particularly affected by bleaching, acidification and storm damage, especially when they are also under stress from land-based pollution and sedimentation. As a result, some models have predicted that coral reefs will disappear by the end of the 21st century, possibly more quickly, under even relatively optimistic models of climate change (e.g., Heron *et al.* 2017). The impacts are not uniform, however, with some evidence that equatorial reefs are less vulnerable than sub-equatorial ones, and that the coral fauna may be able to adapt to better survive high-temperature events (Sully *et al.* 2019). Coral reef areas that are less affected by bleaching will form vital sources of replenishment for re-colonization of degraded reefs in future, making their conservation critical for the survival of these ecosystems.

Reef-forming corals are highly sensitive to changes in sea-surface temperature (Pernice and Hughes 2019). Bleaching occurs when a temporary rise in water temperature of one to two degrees causes the coral polyps to expel the symbiotic algae living in their tissues. Bleaching results in coral sickness and death, loss of coral cover, and changes in the composition of coral species in the reef. These changes have impacts on the fish and other species that live on the reef. Bleaching has been reported locally for over a century but global bleaching events have been reported since 1979 (Hoegh-Guldberg, 2017). A three-year global coral bleaching event, the third ever recorded and most severe to date, occurred from 2014-2017. It was exacerbated by an El Niño event in 2015-2016 followed by a La Niña event into 2017. It affected more reefs than any previous global bleaching event and was worse in some localities, including the Great Barrier Reef, which experienced its worst ever bleaching (NOAA 2018). In 2020, bleaching was detected in the Lease Islands (Maluku) (Coral Triangle Center 2020b).

Acidification of ocean surface waters occurs as the increasing concentration of CO_2 from the atmosphere is dissolved into the ocean. The average pH of sea water has decreased (become more acid) by 0.1 since the pre-industrial era (Findlay and Turley 2021). The greater acidity reduces the availability of carbonates, which coral polyps extract from seawater to form their 'skeletons', and so reduces the speed at which they can recover from storm damage and erosion. At the same time, the more acidic sea water accelerates bioerosion and dissolution of reefs. The patterns of impact are complex, as there are local variations in coastal seawater chemistry influenced by rainfall and drought over coastal catchments: factors that are themselves changing as the climate changes.

The third effect of climate change on reefs is increased frequency and intensity of storms. This is leading to greater physical damage to reefs, which may already be fragile because of bleaching, acidification or local factors, such as sedimentation and eutrophication. Wallacea's reefs are somewhat protected from this impact, as cyclones are concentrated north and south of 8° of latitude. Regions to the north (e.g. Philippines) and south (e.g. the Great Barrier Reef) suffer greater impacts from cyclones. In addition to the physical action of waves on shallow reefs, increased rainfall intensity in coastal catchments increases soil erosion and run-off, leading to sedimentation and turbid waters, adding to the stress on coastal ecosystems.

While much of the focus of climate change impacts has been on coral reefs, impacts are also expected on seagrass and mangrove ecosystems (Short and Heckles 1999). The distribution and productivity of these ecosystems will be affected by storm events, changed sedimentation and eutrophication patterns as a result of changes in rainfall patterns over terrestrial catchments and sea level rise.

In terrestrial environments, changes in temperature and rainfall will influence the distribution of vegetation communities, parasites and diseases, and so affect the suitability of a location as a habitat for a specific species. Some species may have the option of following climatic zones, as they move to higher altitudes or higher latitudes, but, for many, there will be no spatial options. If they cannot adapt to the changed circumstances, these populations can be expected to decline or go extinct in the long run. Knowledge of species habitat requirements and the constraints on their populations are yet good enough to allow modeling of these impacts, and so a precautionary approach is required: maintaining habitat patches that are as large as possible, and especially maintaining connectivity between patches.

The impact of climate change on wetland ecosystems is likely to be particularly severe. Reduced rainfall, increased rainfall intensity, run-off and soil erosion will all impact on the availability and quality of water. Additional pressure on water resources can be expected from human activities, particularly farming, tourism and urbanization. For forest and grassland species, the risks of climate change include reduced humidity and more intense seasonal droughts, which will impact on plant communities and increase the frequency and intensity of fires.

In the past, discussions on REDD+ and biodiversity conservation in Indonesia took place separately, with little coordination between the two. This was despite that fact that, as noted above, loss of biodiversity and ecosystems is a major contributor to emissions, while conservation of these systems can make an important contribution to climate mitigation and adaptation. In the worst cases, climate-change mitigation actions, such as tree planting,

may be damaging to biodiversity, if the trees are poorly sited or an inappropriate species. More often, opportunities for synergy are missed. Planning of land use and resources management, from community level to districts and provinces, as well as within protected areas, needs to take account of both biodiversity and climate change. Agencies and projects are now adopting this integrated approach. For example, WWF-Indonesia worked on this in a national park in Kalimantan, while the MoEF's KfW-funded Forclime III project in and around Lore Lindu National Park in Sulawesi addressed livelihoods, conservation management and emissions reductions simultaneously.

10.3 Social and economic impacts of climate change

The close links between biodiversity loss, land degradation and climate change mean that human livelihoods are increasingly impacted, with more intense and unpredictable climatic events associated with increased risks of soil erosion, forest fires, invasive species, pests and pathogens (IPBES 2018). These impacts will affect farming systems, water supplies, infrastructure and health. The impacts are felt differently by different communities, households and individuals, depending on their livelihoods, location, wealth, gender roles and age.

MoEF's Vulnerability Index Data and Information System (sistem informasi dan data indeks kerentatan, SIDIK) assesses the vulnerability of villages to climate change, using 21 socio-economic and biophysical indicators linked to the sustainable development goals. An assessment in 2020 concluded that 7,178 out of the nation's 83,931 villages (8.5 percent) are vulnerable or highly vulnerable to climate change. Furthermore, about 4,427 out of 7,178 these vulnerable villages (61 percent) are located near or in state forest areas, emphasizing the importance of the link between forests, rural livelihoods and climate change.

While the impact of climate change is difficult to separate from other local factors and trends, studies have identified crop loss and failure around Lake Tempe, Sulawesi Selatan (Sumiati *et al*. 2020), a 50 percent decline in the number of water springs on Mount Rinjani, Lombok over 27 years (KLHK 2017d, in MoEF 2020, p84). Over the same period, there was a 75 percent decline in the number of springs in Nusa Tenggara Barat province, from 702 in 1980 to 180 in 2006/2007 (*ibid*). Increases in temperature, and especially temperature differences between land and sea, cause stronger winds and larger waves. Local fishers in Wallacea already experience periods during the northwest monsoon when they cannot go to sea to fish, and it may be that these conditions will become more frequent or less predictable. Climate change will not only impact traditional livelihoods but also tourism, which is highly sensitive to perceptions of the risk of 'natural' disasters such as flooding, sea-level rise and coral reef decline (e.g. Wijaya and Furqan 2018).

Climate change impacts directly or indirectly upon the national economy. The national planning agency, Bappenas, in its review of the National Action Plan on Climate Change Adaptation (RAN-API), found that the potential economic losses from the impact of climate change on four priority sectors-marine and coastal, water, agriculture, and health-will amount to almost US$8 billion (IDR 115.53 trillion) by 2024 (MoEF 2020, p84).

Temperature patterns are also associated with the distribution patterns of mosquitoes, which are the vectors of malaria, dengue fever and other diseases. Malaria transmission does not occur below 16°C or above 33°C, and proliferation of malaria occurs when

optimum temperatures of around 28°C enable larvae and adults to develop. Human populations already show the impacts of this. In Sumba, for example, populations in the warm coastal lowlands show a higher incidence of the genetic abnormality G6PD, which confers some protection against malaria, compared to populations on the high plateau of the island. Increases in temperature mean increased opportunities for the malaria parasite to infect new populations, who may have less natural immunity.

Climate change will affect agricultural productivity. In addition to extreme precipitation events, an extension to the wet season may also cause an increase in the populations of pests, causing losses from reduced agricultural production. High rainfall in the range of 50 to 172 mm will increase the spread of the bacterial leaf blight in rice (Merliyuanti 2013). These pests could occur in several regions, including north-central Timor, eastern Sumba, southern Sulawesi and central Maluku. Maize, the predominant small-farmer crop in Timor-Leste, is vulnerable to drought and irregular rainfall, and so is expected to suffer under future climate change scenarios. Coffee, Timor-Leste's most important export crop, requires adequate rainfall, a narrow humidity range, and a long enough dry season season to allow for flowering and ripening of the berries (Barnett *et al.* 2007). It is the main cash crop in a number of districts that have the right climate but the predicted changes are likely to push the climate envelope for coffee upslope (where this exists as an option), almost certainly bringing farmers into conflict with forest conservation regulations, and further undermining efforts to stabilize fragile water catchments.

10.4 Climate change policies, institutions and programs

10.4.1 Policies and institutions

Until 2014, the rapid early development of REDD+ institutions and policies in Indonesia was centered on the REDD+ Agency, which reported directly to the office of the President. The REDD+ discourse added to pressure for greater clarity on rights and control of forest and land, and so contributed to the development of national policies (including the One Map program, designed to establish a single reference for land use decision making), and the acceleration of social forestry, agrarian reform and efforts to resolve conflicts over the forest estate. The REDD+ agenda, and the related need to respond to the 2015 fires, also contributed to the enactment of the Moratorium on New Licenses in Primary Forest and Peatlands, and the subsequent policies on the protection of peatlands, including the establishment of the Peatland Restoration Agency (see Chapter 7 for further details).

In 2015, the REDD+ agency and the National Climate Change Council were merged and became a Directorate General within MoEF. Initially this change may have slowed the development of climate change policy, partly because the ministry itself was newly formed from the merger of the Ministries of Forestry and Environment, but the Directorate-General of Climate Change Control is now the leading agency dealing with the issue in Indonesia, and climate change is firmly established among the central objectives of MoEF (see, for example the MoEF Strategic Plan, 2020-2024). At the same time, the management of REDD+ and result-based payments for emissions reduction has become more centralized and has focused more on establishing the technical mechanisms for implementation than on fundamental change to the governance of the land use and forestry sector.

At national level, the most important policy advances have been:

- Development of a national monitoring, reporting and verification (MRV) system, linked to the National Carbon Accounting mechanism (INCAS).
- Establishment of Forest Reference Emissions Level (FREL). Indonesia's first FREL was valid from 2013 to 2020. An updated analysis was submitted in 2022 and will be valid until 2030 once it is accepted by the UNFCCC. The updated FREL is more detailed than the first, with consideration of a wider range of carbon pools and emissions sources, especially peatlands and mangroves. A 2019 decree from the Climate Change Directorate-General of MoEF provided for provincial-level FREL, using the national FREL as a reference.
- Indonesia's first Nationally Determined Contribution (NDC) document was submitted to the UNFCCC in November 2016, with a biennial update submitted 2019 and an Enhanced NDC submitted in 2022.
- Establishment of a REDD+ safeguard information system, SIS-REDD+, which is operational in Jambi, East and West Kalimantan provinces.
- A National Registry on Climate Change, the Sistem Registry Nasional, was established in 2016, with the aim of bringing existing projects that are generating carbon credits into a single system for accounting, thus avoiding double-counting of emissions reductions sold on the voluntary market.
- Establishment of the Environment Fund Management Agency as a mechanism to receive and disburse funding for environmental issues, including climate change (see below).

In October 2021, Presidential Regulation No. 98/2021 on Carbon Pricing was enacted. This regulation provides a legal framework for carbon trading, carbon tax, results-based payments and other mechanisms in an effort to accelerate moves towards a low-emission economy.

Per the Enhanced NDC, Indonesia's economy-wide commitment to emissions reductions by 2030 is 31.89 percent unconditionally, or 43.20 percent with international assistance. The forestry and other land uses sector plays a critical role in achieving this goal, contributing 17.4 percent to the unconditional reduction or 25.4 percent to the conditional reduction (Republic of Indonesia 2022).

Once seen as world-leading, Indonesia's commitment is now viewed as unambitious, allowing the country to meet its target at the same time as increasing emissions. This is, in part, due to the selection of a baseline that gives relatively high estimates of emissions, and also because of the reliance on the forestry sector to reduce emissions, avoiding reducing the country's dependence on fossil fuels. There is also criticism of the Indonesian biofuel policy, which supports a shift away from fossil fuels but mandates a high proportion of oil palm, putting further pressure on land and forests. As a result, Indonesia's unconditional and conditional commitments are both rated "critically insufficient" by the Climate Action Tracker (2025), with particular concern about post-pandemic economic recovery, which has focused on continued support to the coal as a source of power. Indonesia was one of only five countries globally that were still building new coal-first power plants in 2020, and it has the fourth-largest volume of coal-powered generation capacity planned and under construction. The enactment of the Job Creation (omnibus) Law has been interpreted as re-emphasizing the government's commitment to a conventional model economic growth driven by investment in resource-based industry, without sufficient attention to

environmental and social safeguards or to the opportunity to start a shift to a less carbon-intensive economy.

There has also been progress on low emissions development at sub-national levels. Indonesia's NDC emphasizes action at the provincial level to deliver emissions reductions, and the central government has trialed mechanisms to incentivize green investment in provinces and districts, for example through the "ecological transfer" mechanisms from center to province and province to district, known as TAKE and TAPE, and through the recognition of jurisdictional approaches in the National Medium-term Development Plan. The central government has also implemented trial emissions reduction programs in Jambi province, Sumatra (funded through the Biocarbon mechanism) and East Kalimantan (supported by FCPF).

Seven Indonesian provinces (from Kalimantan, Sumatra and Papua; albeit with none from Wallacea) are members of the Governors' Climate and Forests Task Force, a coalition of governors from 45 prominent states and provinces (sub-national jurisdictions) in 11 countries. The provinces signed the 2014 Rio Branco declaration, committing them to reducing deforestation in their jurisdictions with the assistance of international funding. Sulawesi Selatan province was the first jurisdiction in the country to sign an MoU on Low Carbon Development with the National Development Planning Agency (BAPPENAS) in February 2019.

A forum to promote green and low emissions development at the district level, the Green District Platform (*Lingkar Temu Kabupaten Lestari* or LTKL), was established in 2017. It has nine member districts, including three in Wallacea: Sigi (Sulawesi Tengah province); Gorontalo; and Bone Bolango (both in Gorontalo province). The forum links member districts with sources of finance and support for green development, facilitates sharing and joint capacity building activities and supports networking and communication of sustainable economic development.

At the level of individual villages, there is potential for the village fund mechanism to be used to incentivize and fund low-emission land-use activities. The forerunner to the fund, the PNPM program, had a successful 'green' component, which funded activities linked to sustainable land use, climate and biodiversity at the village level. Some district governments (for example Siak district, in Riau province, Sumatra) are now starting to explore how the village fund can be used to advance their low emissions commitments.

Sub-national 'jurisdictional approaches' to REDD+ are being implemented in parallel to wider initiatives on sustainability. These jurisdictional approaches envisage leveraging economic benefits for districts and provinces that adopt a raft of sustainable approaches, including agrarian conflict resolution, land tenure reform and sustainable commodities production, as well as REDD+. The jurisdictional approach allows REDD+ and related agendas, such as sustainable oil palm and development of social forestry, to be integrated within a specific jurisdiction. The idea has been adopted by the new National Medium-term Development Plan, partly through the intervention of LTKL, and technical guidelines are now being developed for its wider implementation.

10.4.2 Climate change funding

In 2009, the Indonesian Government created the Indonesian Climate Change Trust Fund (ICCTF). The fund is a grantmaking mechanism managed by a work unit within BAPPENAS, under the guidance of a board of trustees drawn from BAPPENAS, the Ministry of Finance, civil society and donors but not, importantly, MoEF. The ICCTF manages domestic resources and international funds. Grants are awarded to NGOs for projects that are aligned with the fund's geographic and technical priorities. Grantees are typically larger NGOs, which can demonstrate a track record of successful project implementation and the ability to handle grants over US$1 million.

Since 2016, the fund has supported more than 100 projects, including several in Wallacea focused on community-based adaptation. These include a project on sustainable dryland farming and prawn farms on Pangkajene Kepulauan (Sulawesi), and one on food security on Rote island (Timor).

In 2019, the Environmental Funding Management Agency (*Badan Pengelola Dana Lingkungan Hidup* or BPDLH) was established as a public service agency under the Ministry of Finance. The fund has a steering committee chaired by the Coordinating Minister for Economic Affairs, with members from line Ministries including MoEF. It is intended that the fund will distribute grants, loans, results-based payment and other payments to governmental and non-governmental actors through a number of funding 'windows', including nature conservation, climate change (for REDD+ funds), and environmental degradation. The fund is expected to manage funds estimated at US$800 million from Norway between 2020 and 2030, US$103 million from the Green Climate Fund, US$11 million from the FCPF and US$70 million from the Biocarbon fund.

In 2016, Indonesia and Norway signed a Letter of Intent (LOI) to reduce greenhouse gas emissions from deforestation and forest degradation. Norway undertook to support Indonesia to put in place REDD+ mechanisms, and then to make payments based on emissions avoided. In 2019, Norway announced that Indonesia would receive its first results-based REDD+ payment, of US$56 million, for reductions of 11.2MtCO_2e. However, the funds were never released, prompting Indonesia to terminate the agreement in 2021.

The Green Climate Fund is the funding vehicle of the UNFCCC and the Paris agreement. It funds climate-change mitigation and adaptation work, including on land use, forests and ecosystem. The GCF has an indicative allocation of US$273.3 million for Indonesia, covering six projects. The project with the greatest potential relevance to biodiversity conservation in Wallacea is FP130: Indonesia REDD-Plus RBP for results period 2014-2016 ($103 million). Implemented until 2025, the project is focused on supporting implementation of the national REDD+ strategy, including establishment of forest management units and social forestry schemes. Indonesia has also received a results-based payment of US$103 million from the Green Climate Fund, for reductions of 20.3 MtCO_2e below baseline between 2014 and 2016.

Indonesia has received support from the World Bank-led Forest Carbon Partnership Facility (FCPF) and the Biocarbon Fund (in Jambi, Sumatra) to support REDD+ readiness activities. The UNREDD+ program, which supported activities in Sulawesi Tengah, closed in 2015.

10.4.3 REDD+ projects in Wallacea

Indonesia has one of the largest number of REDD+ projects worldwide, although these are heavily concentrated on the islands of Sumatra, Borneo and New Guinea. The 2014 ecosystem profile identified eight projects active in climate-change related fields in Wallacea. By 2025, only two remained (Table 54).

Table 54: REDD+ and climate change-related projects in Wallacea

Project name	Developers/ implementers	Location (KBA status)	Aims
Mamuju habitat 2008-2048	Keep the Habitat (private company) Partners: Provincial and District Governments, Ministry of Forestry, Private company	Mamuju district, Sulawesi Barat province (probably in a KBA)	1.1 million ha. Planting 174,000 ha of forest on degraded land, protecting 832,000 ha of forest, producing biomass energy. No carbon transactions yet recorded
Forest land use and climate change in North Sulawesi (FLUCC) in the Poigar Forest 2009-2038	Office National des Forets–International (ONF-I) (France), French NGO Green Synergies, Province of Sulawesi Utara	Bolaang Mongondow and South Minahasa districts, Sulawesi Utara province (probably a KBA but precise project location not known)	35,000 ha Aims to support replanting and to avoid deforestation of at least 20,000 ha of forest. Avoided emissions potential of 5.1 mega-tons carbon; transactions yet recorded

10.5 Conclusion: opportunities for Wallacea within the climate agenda

The narrow interpretation of REDD+ as a technical exercise in measurement of forest carbon has now been replaced by a broader concept of sustainable, low-emissions land use, which includes commercial land use (sustainable oil palm, for example), forest and biodiversity conservation, community land rights and conflict resolution, and a combination of market and government incentives for implementation.

To date, Wallacea has been a low priority in the REDD+/climate change agenda in Indonesia, as a result of the focus on the enormous and highly threatened carbon stocks in the peatlands of Sumatra and Kalimantan, and the forests of Papua and Kalimantan. However, as climate-related policies and funding schemes are institutionalized and rolled out by central government, there are likely to be more opportunities for local governments, villages and perhaps also CSOs to access funds for sustainable livelihoods and resource management. These could offer important opportunities to co-fund or sustain activities funded by CEPF. It seems likely that, in future, projects could strategically focus on working with community groups, village and district governments to assist them secure a share of these new funding streams. This, in turn, suggests that there is an important task, for the RIT or capacity development partners, to ensure that grantees are aware of the funding mechanisms and opportunities available to local stakeholders.

While the overall direction of policy development and implementation is positive, progress remains fragile. There are already examples where progressive policies adopted under the leadership of a provincial or district head have been weakened after elections, and the national government's own commitment to the climate agenda sometimes appears to conflict with its policies on investment and economic growth. Civil society in Indonesia is aware of this vulnerability and is working to institutionalize the pro-climate agenda into legislation, institutions and their budgets. While much of this work is beyond the scope of CEPF grants in Wallacea, it will be important for the RIT to remain up to date with developments in the national climate agenda, to contribute where there is an opportunity, and to keep grantees and partners informed of changes.

11. ASSESSMENT OF CURRENT CONSERVATION INVESTMENT

In Indonesia, the government provides around US$30 million per year for conservation in Wallacea, to cover the management costs of 17 national parks and the operations of seven offices of the Natural Resources Conservation Agency (Balai KSDA and Balai Besar KSDA). The figure has changed little in US dollar terms since 2013 but has risen by more than 50 percent in IDR terms. The government of Timor-Leste provides minimal dedicated funding for conservation. Annual support from international donors for conservation in Wallacea accounts for around US$40 million in grants and US$100 million in loan financing, although these figures depend heavily on how broadly conservation is defined. In any case, much larger sums are spent on community development and welfare projects, many of which address environmental issues as a development problem. Around two-thirds of investment from international donors addresses terrestrial and freshwater conservation, and about one-third addresses marine and coastal conservation. There is little support of any kind for biodiversity conservation from local governments or private sector actors.

In Timor-Leste, very limited funds are available from the government, and donor funding is concentrated on human needs and peace building.

11.1 Investment by source

11.1.1 Central government financing for protected areas and wildlife conservation

The largest direct investment in conservation by government is by the Natural Resources and Ecosystems Conservation Directorate-General (DitJen KSDAE) of MoEF. Table 55 provides a breakdown of investment by the Ministry of Environment and Forestry per site and subregion.

In 2019, the funding for the 13 terrestrial national parks in Wallacea (excluding four marine national parks: Bunaken; Take Bonerate; Togean; and Wakatobi) amounted to US$14.8 million or just over US$10.6 per hectare. In terms of staffing, 909 staff were employed for the key functions of ecosystem management and extension, and as forest police across the national parks and natural resource conservation units in Wallacea. This means that, on average, in 2019, a single staff member was responsible for managing 3,106 ha.

Outside the national parks, the regional natural resource conservation units are responsible for the management of about 1.4 million ha of other protected areas. Here, one staff member was responsible for, on average, 3,809 ha in 2019. These figures include Gadang-Dewata National Park, which was established only in 2016 and did not have its own management unit in 2019.

While the staff-to-area ratios of national parks and those of other conservation areas are not widely different, it is important to note that national parks are generally large, consolidated units with a low boundary-to-area ratio and a dedicated office based close to the site. Other conservation areas are usually smaller, fragmented and often remote from the nearest BKSDA office. It is, therefore, reasonable to conclude that national parks are more likely to have effective management.

Table 55: Expenditure for national parks (NP) and natural resource conservation units (BKSDA and BBKSDA) in Wallacea, under MoEF, 2019

National park/regional unit	Area (ha)	Budget 2019 (USD)	Percent change in budget 2013 to 2019*	2019 budget per ha
Nusa Tenggara Timur BBKSDA	121,226	1,935,685	+17	16
Gunung Rinjani NP Unit	37,225	1,964,305	+143	53
Kelimutu NP Unit	5,424	915,204	+40	169
Komodo NP Unit	179,276	1,638,767	+22	9
Laiwangi–Wangameti and Manupeu Tanadaru NP Unit**	84,707	1,085,517	-10	13
Tambora NP	71,646	1,539,994	(NP created 2015)	21
Nusa Tenggara Barat BKSDA	52,671	1,882,413	+56	15
Total Lesser Sundas	**552,175**	**10,961,885**	**+59**	**20**
Bantimurung NP Unit	44,601	2,412,373	+189	54
Bogani Wartabone NP Unit	274,022	1,507,799	+58	6
Bunaken NP Unit	n/a	839,216	+8	
Sulawesi Tengah BKSDA	194,853	1,145,881	+13	3
Gandang-Dewata NP	180,078	(no allocation)	(NP created 2016)	
Lore Lindu NP Unit (BB)	205,083	1,799,902	+67	9
Sulawesi Utara BKSDA	159,835	945,566	-17	6
Rawa Aopa NP Unit	111,396	1,164,772	+15	10
Sulawesi Selatan BBKSDA	225,340	1,917,923	0	9
Sulawesi Tenggara BKSDA	184,008	1,183,838	+5	6
Taka Bone Rate NP Unit	n/a	812,553	-2	
Togean Islands NP Unit	n/a	636,832	+13	
Wakatobi NP Unit	n/a	899,988	+15	
Total Sulawesi	**1,579,216**	**15,266,642**	**+27**	**10**
Aketajawe–Lalobata NP Unit	324,815	1,836,918	+155	6
Maluku BKSDA	203,726	1,041,303	-23	5
Manusela NP Unit	163,174	774,257	+4	5
Total Maluku	**691,715**	**3,652,478**	**+30**	**5**
Total Wallacea	**2,823,106**	**29,881,005**	**+38**	**11**

Source: 2014 data from Program and Evaluation Section of Forest Protection and Nature Conservation Directorate, Ministry of Forestry, Feb. 18, 2014. 2019 data from LKJ_Ditjen_KSDAE_2020.pdf (menlhk.go.id), accessed 08 June 2021.
Notes: *change in budget compares Indonesian rupiah figures for 2019 and 2013 directly and does not take into account inflation; **two national parks on Sumba are managed by a single unit.

In the past, bilateral and multilateral donor projects provided additional funding for protected area management (e.g., USAID for Bunaken, ADB for Lore Lindu, GEF for Aketajawe-Lalobata National Park and Karakelang Wildlife Reserve) but, as of 2025, relatively few protected areas were receiving international donor funding at scale for their management.

The Ministry of Marine Affairs and Fisheries funds the operations of two conservation agencies: the National Marine Protected Areas Authority (Balai Kawasan Konservasi Perairan National or BKKPN); and the Coastal and Marine resources Management Authority (Balai Pengelolaan Sumberdaya Pesisir dan Laut or BPSPL). BKKPN manages 10 national marine protected areas, while BPSPL has a wider role in marine resources management. Table 56 shows the 2019 budgets for these agencies.

Table 56: Budgets for agencies under the Ministry of Marine Affairs and Fisheries, 2019

Regional unit	Budget 2019 (US$)
BKKPN, Kupang	1,177,821
BPSPL, Makassar	1,067,685
Loka Pengelolaan Sumberdaya Pesisir dan Laut, Sorong	669,169

11.1.2 Central Government funding: Special Funds for the Environment (DAK-LH) and Forestry (DAK-Kehutanan) and the village fund

Special Allocation Funds (Dana Alokasi Khusus or DAK) are allocated each year by central government to specific areas of work and the ministries responsible for them. Education, health and infrastructure are normally the highest spending areas.

In 2019, the total allocation of DAK nationally was US$9.5 billion (IDR138 trillion). The provinces and districts in Wallacea received US$34 million for marine and environment/forestry activities (Table 57). Sixty percent of the funding went to Sulawesi, with the balance divided more or less equally between Nusa Tenggara and Maluku. Sixty-three percent of the funding was for marine activities, and 37 percent for environment and forestry.[2]

Table 57: Special allocation funds for Wallacea for marine and environmental/ forestry sectors, 2019

Bioregion	Marine (USD)*	Environment/ Forestry (USD)	Total (US$)
Sulawesi	11,875,347	8,627,800	20,503,147
Maluku	5,943,059	1,593,986	7,537,045
Lesser Sundas	3,823,399	2,224,896	6,048,295
Total	21,641,805	12,446,681	34,088,486

Note: *Figures converted from IDR at 14,580 IDR: 1 US$.

Another important form of central government support to the regions is Village Funds (dana desa), which are allocated via districts for spending by village governments on the basis of agreed plans and budgets. Village funds totaled US$4.8 billion 2019 (IDR70 trillion), with US$970 million allocated to the regions of Wallacea (Table 58). Just over half went to Sulawesi, 30 percent to Nusa Tenggara and less than a fifth to Maluku.

[2] Figures for DAK allocation from Finance Ministry http://www.djpk.kemenkeu.go.id/wp-content/uploads/2018/10/Rincian-Alokasi-DAK-Fisik-TA-2019-Upload-Final-Fix-31-Okt.pdf

Table 58: Allocation of village funds in Wallacea, 2019

Bioregion	Village fund allocation (USD)*
Sulawesi	544,603,514
Maluku	138,142,200
Lesser Sundas	288,191,636
Total	**970,937,350**

Source: http://www.djpk.kemenkeu.go.id/wp-content/uploads/2018/10/DANA-DESA.pdf
Note: *figures converted from IDR at 14,580 IDR: 1 USD

Climate-change-related funding is discussed in Chapter 10.

11.1.3 Bilateral funding

According to World Bank and OECD data, Indonesia received more than US$2.6 billion in Official Development Assistance (ODA) in 2022. However, after loan repayments are taken into account, Indonesia received net ODA of only US$663 million (Table 59).

Table 59: ODA receipts for Indonesia, 2016-2022 (US$ million)

Figure	2016	2017	2018	2019	2020	2021	2022
Gross ODA	2,382	2,694	3,386	1,549	3,391	2,616	2,635
Net ODA*	-108	280	963	-683	1,210	626	663

Note: * = Net ODA is Gross ODA minus loan repayments.
Sources: OECD (2025); World Bank Group (2025).

Indonesia has been classified as a middle-income country since the late 1980s, and continued growth in per capita income has resulted in a reduction in foreign aid as a percentage of Gross National Income (GNI). Throughout the 1990s and early 2000s, net ODA averaged around 1 percent of GNI. Over the last two decades, this proportion has been around 0.1 percent (World Bank Group 2025).

Over the 10 years between 2014 and 2023, Indonesia's main (gross) bilateral donors were Germany and Japan, each providing more than US$620 million per year, on average, followed by Australia, the USA and France, each of which provided more than US$240 million per year (OECD 2025). Around two-thirds percent of ODA received over this period was for "social infrastructure and services" (i.e., education, health, etc.) or "economic infrastructure and services" (i.e., transport, energy, etc.); "general environmental protection" (the category that includes environmental policy and biodiversity) accounted for just 5 percent of ODA received (OECD 2025).

Germany provided Indonesia with an average of US$649 million annually in bilateral ODA between 2014 and 2023, making Indonesia one of largest recipients of German development assistance. Bilateral cooperation covers the sectors of environment (including climate change and sustainable infrastructure), governance and democracy, and technical and vocational education.

A national program of relevance to conservation was Strengthening Climate Governance in Indonesia (2017-2021), which supported implementation of the Paris climate agreement through national policy and stakeholder capacity building.

Four German-funded forestry sector projects are on-going in the country, two of them in Wallacea:

- Forest Program IV supports watershed restoration, community-based forest management and biodiversity conservation in the Mamasa watershed in Sulawesi Barat and Sulawesi Selatan. This program, which has a budget of €23.5 million, includes support for the management of Gandang Dewata National Park.
- Forest Program V supports community-based and sustainable forestry schemes to improve local livelihoods in four parts of the country, including Flores, Nusa Tenggara Timur. This program has a budget of €11.5 million.

In the marine realm, the German development bank, KfW, is managing two projects to support MPA and sustainable fisheries management, livelihood development, sustainable financing and transnational cooperation. The Marine Biodiversity and Coastal Livelihoods in Sulawesi/Coral Triangle project (2018-2025) has a budget of €7.0 million and focuses on the provinces of Nusa Tenggara Barat, Sulawesi Utara and Aceh (outside of the hotspot). The Marine Biodiversity and Support of Coastal Fisheries in the Coral Triangle project (2019-2026) has a budget of €9.3 million and focuses on the provinces of Sulawesi Utara and Maluku Utara. Both projects are being implemented in partnership with MMAF and WCS.

Under the Solutions for Marine and Coastal Resilience in the Coral Triangle (SOMACORE) program, funded by the German government's International Climate Initiative (IKI), Konservasi Indonesia and Conservation International's Timor-Leste Program are implementing efforts to promote seascape management in transnational habitats, strengthen the resilience of coastal communities, and support regional policies that protect marine and coastal areas. Work focuses on Nisa–Teluk Saleh KBA (IDN247) in the Lombok-Sumbawa marine corridor, Wetar island in the Busur Banda Dalam marine corridor, and the Belu region of Timor island in the Perairan Timor Leste marine corridor.

Also of relevance to Wallacea is the 1000 Islands Renewable Energy for Electrification Program (REEP), which is managed by GIZ and implemented in partnership with the Directorate General for New Renewable Energy and Energy Conservation (DG-NREEC). Phase I of the program promoted solar energy for remote communities in Nusa Tenggara Timur. During Phase II, the program is supporting the development of hydropower in Sulawesi, Nusa Tenggara Timur and Bangka Belitung (outside of the hotspot). The budget for the second phase is €2.0 million.

Germany has also supported the Climate Change and Land Use in ASEAN program: a regional project hosted by the ASEAN secretariat in Jakarta.

Japan provided Indonesia with an average of US$622 million annually in bilateral ODA between 2014 and 2023, making Indonesia the one of the largest recipients of Japanese development assistance. The work of the Japan International Cooperation Agency (JICA) covers a wide range of sectors, including health, education, agricultural development, infrastructure and good governance. Projects of relevance to conservation in Wallacea (JICA 2024) include:

- Project of Capacity Development for the Implementation of Climate Change Strategies (2nd phase) (2019-2023).

- Project for Capacity Development on Operation of Earthquake and Tsunami Analysis and Warning Dissemination (2022-2025).
- The Disaster Resilience Enhancement and Management Program Loan (II), co-financed by AFD and implemented by the National Development Planning Agency, Bappenas (signed in March 2021).
- Project for Promoting Sustainable Fisheries Development in Outer Islands of Indonesia (2022-2025). This project, which has a budget of US$28 million, is working with MMAF to improve port facilities (and thus livelihood opportunities for small-scale fishers) on six islands, including three in Wallacea: Morotai in Maluku Utara; and Yamdena and Moa in Maluku.

Australia has long been a major development aid donor to Indonesia and has a history of work in poor regions of Nusa Tenggara. Economic and political ties between the two countries strengthened with the signing of the Indonesia-Australia Comprehensive Economic Partnership Agreement in March 2019, and a Maritime Cooperation Plan of Action for 2018-2022, which included a Maritime Capacity Building Initiative. Current bilateral programs focus on health, security, stability and economic recovery from the COVID-19 pandemic. Australia provided Indonesia with an average of US$287 million in annual bilateral ODA between 2014 and 2023, although the amount of ODA provided halved over this period.

Relevant Australian support to Indonesia includes:

- US$130 million for the Australia–Indonesia Climate and Infrastructure Partnership (KINETIK) (2022-2027), which supports Indonesia's efforts in accessing increased climate finance, developing more climate resilient infrastructure and accelerating its clean energy transition. The partnership includes the KINETIK NEX facility, which provides target support and investment to start-ups companies in eastern Indonesia to creates jobs in clean energy and the green economy.
- US$104 million for the Synergies and Collaboration for Service Delivery Acceleration (SKALA) initiative (2022-2030), which supports basic service provision to poor and vulnerable communities in less developed regions.
- US$78 million for the Australia–Indonesia Partnership Towards an Inclusive Society (INKLUSI) (2021-2029), which works with government and civil society partners to advance their work in gender equality and social inclusion.
- US$42 million for the Australia–Indonesia Knowledge Partnership Platform (KONEKSI) (2023-2027), which supports partnerships between Australian and Indonesian organizations for developing inclusive and sustainable policy and technology. Initiatives supported under this platform include collaborative research on environment and climate change.
- US$42 million for the Australia–Indonesia Partnership for Disaster Risk Management (SIAP SIAGA) (2019-2024), which included activities in Nusa Tenggara Barat and Nusa Tenggara Timur to empower local government and communities in increasing disaster resilience.
- US$1.7 million for the Supporting Climate Change Integration and Environmental Sustainability in Indonesia (2023-2026) initiative, which supports Australia's climate change and sustainability mainstreaming objective across its bilateral development partnership with Indonesia, including through building the Department of Foreign Affairs and Trade (DFAT)’s climate change capability.

The **USA** provided an average of US$255 million in bilateral ODA to Indonesia annually between 2014 and 2023. Over this period, the environment was one of four strategic priorities for US-Indonesian bilateral cooperation. Under the environment program, USAID supported work on fisheries and marine biodiversity, forest conservation and sustainable land management, renewable energy, sustainable small-holder commodity production and urban WASH (water, sanitation, solid waste and hygiene). Of these programs, only the one on fisheries and marine biodiversity was directly relevant to Wallacea.

Prior to its official closure in 2025, the United States Agency for International Development (USAID) was a long-standing supporter of climate and marine projects in Indonesia, with large projects including the Indonesia Marine and Climate Support (IMACS) program, which focused on the Lesser Sunda–Banda seas, the Marine Protected Areas Governance (MPAG) project, and the Sustainable Ecosystem Advanced (SEA) program, which worked with local governments and communities around FMA 715. This FMA covers much of northern Wallacea, from Tomini Bay to Halmahera and east to Papua. The SEA program focused on MPA management and IUU fishing. Although it funded some large NGOs, it did not provide funds for small-scale community work by CSOs, with the exception of the formation of community surveillance groups under the government's PokWasMas scheme. The program did, however, create opportunities that local CSOs could build on, such as the legal establishment of three MPAs around Buru island, which required follow-up work to strengthen management capacity and stakeholder engagement.

USAID also supported the Supporting Nature and People-Partnership for Enduring Resources (SNAPPER) project, implemented by TNC in partnership with MMAF. The project worked with communities and fishing companies to agree limits on the intensity of fishing effort in six FMAs, collecting data and providing input to sustainable management policies.

The Millennium Challenge Corporation (MCC), is an independent arm of the US bilateral assistance program. From 2013 to 2018, the MCC implemented the Indonesia Compact, a US$474 million program, which included five provinces in Wallacea. One of the program's three components, the Green Prosperity Initiative, focused on renewable energy, improved land management and reduced land-based GHG emissions. Funds were disbursed through 66 grants for activities such as installation of renewable energy infrastructure, training of farmers and certification of smallholder commodity production.

In April 2023, a second five-year program was signed, with a budget of US$649 million: the Indonesia Infrastructure and Finance Compact. The compact has a different focus to the original program: improving the financing of infrastructure (particularly transport and logistics infrastructure) and increasing access to finance for micro, small and medium enterprises. One element that could potentially create opportunities for civil society in Wallacea is a gender-inclusive value chain finance activity, which aims to increase the availability of finance for women-owned enterprises.

The United States Tropical Forest and Coral Reef Conservation Act (TFCCA) debt-for-nature swap agreement of July 2024 redirects US$35 million of Indonesia's debt to fund coral reef conservation in the Bird's Head Seascape (outside of Wallacea) and the Sunda-Banda Seascape. Work will include grant making to marine-dependent communities and establishment and strengthening of MPAs. The TFCCA funding is managed by Konservasi Indonesia. Implementation is expected to begin in late 2025, allowing for complementary planning with CEPF.

France provided Indonesia with an average of US$241 million annually in bilateral ODA between 2014 and 2023. AFD Group has been working in Indonesia for more than 15 years to promote green and inclusive growth, with the aim of supporting the country's low-carbon development within the context of a just and resilient transition. AFD is unique among bilateral donors in explicitly mentioning biodiversity preservation (along with climate change and health) as one of its core objectives in Indonesia. On-going projects relevant to environmental issues in Wallacea include:

- US$108 million for the Upgrading Indonesian Oceanographic Research Capacities, Addressing Global Climate and Biodiversity Challenges (KRisNa) project (2020-2025), which aims to provide Indonesian public institutions, in particular the Indonesian Institute of Science, means and capacities to conduct oceanographic research on biodiversity, and the impacts of pollution and climate change on coastal and marine ecosystems.
- US$71 million for the Strengthening Climate and Weather Service Capacity-Marine Meteorology System (MMS) project (2019-2026), which is supporting Indonesia's Meteorological, Climatological and Geophysical Agency to develop an integrated marine meteorological information system.
- €1.0 million for the Strengthening the Resilience of Coastal Communities around the Palu Bay Area project (2019-2025), which responds to the September 2018 tsunami that impacted Palu Bay, Sulawesi Tengah, by strengthening the resilience of coastal communities, restoring their economic systems and promoting a community traditional knowledge-based approach to disaster risk reduction.
- €500,000 for a study on monitoring and modelling the circulation of marine debris in Indonesia (2020-2022), which aims to improve the understanding of the propagation of marine debris and its impacts on the seas in order to put in place effective and optimized actions related to this issue. This study supports the implementation of Indonesia's Action Plan on Marine Plastic Debris. Co-financed with US$300,000 from the World Bank, the study is under the umbrella of the Clean Oceans Initiative launched by AFD, the European Investment Bank and KfW in October 2018.

Norway provided an average of US$51 million per year in ODA to Indonesia over the period 2014 to 2023. In 2017, Norway made the first of several intended results-based REDD+ payments. Indonesia received US$56 million for reducing CO_2 emissions in 2017 by 4.8 Mt against the 2006–2016 historical baseline. See Chapter 10 for more information.

The **United Kingdom (UK)** provided Indonesia with an average of US$37 million annually between 2014 and 2023. Most UK bilateral funding for Indonesia either targets other sectors or parts of the country outside of the Wallacea Hotspot (such as the US$51 million (GBP38 million) Investing in Nature, Forests and Land Use (INAFOLU) project, in West Papua and Papua provinces). Nevertheless, there have been some initiatives that contribute to biodiversity conservation in Wallacea.

The UK's bilateral engagement with Indonesia included the Newton fund, which aimed to strengthen science and innovation capacity in partner countries. The fund deployed around US$1 billion (GBP735 million) over the period 2014-2022. In 2018 the Newton Fund, the UK Natural Environment Research Council and the Indonesian Ministry of Research, Technology and Higher Education launched a program title Wallacea Region: Understanding Biodiversity and Evolutionary Responses to Environmental Change, under which research grants totaling US$5 million were awarded for seven collaborative research projects.

The UK runs an Illegal Wildlife Trade Challenge Fund which funds projects working on the issue globally. Several projects focus on terrestrial wildlife in Indonesia, including three national-level projects to: detect and dismantle on-line trade networks; link sanctions for wildlife trade to the harm caused to communities; and build capacity for law enforcement. Only one project directly relevant to Wallacea has been supported by the fund so far: Building Capacity to Reduce Illegal Trade of Shark Products in Indonesia. This US$468,000 project, implemented by the Centre for Environment, Fisheries and Aquaculture Science (Cefas) from 2018 to 2021, focused on DNA testing to support control of trade.

The **European Union** member states provided a combined US$932 million per year in ODA to Indonesia between 2014 and 2023. The main contributors were Germany and France, whose contributions are discussed separately above. Over the same period, the EU institutions provided an average of US$29 million per year. Green inclusive development is a priority for EU development cooperation with Indonesia, along with trade, investment and connectivity, good governance, human rights and human security (including disaster risk management).

A key initiative in the environment sector is the Just Energy Transition Partnership (JET-P) with Indonesia, which was launched at the G20 Summit in Bali in November 2022. The partnership, which involves the EU, member states and other development partners, supports an accelerated transition from fossil fuels to renewable energy. The EU and its members states expect to mobilize around €2.5 billion towards JET-P, with the EU contributing €1 billion via the European Investment Bank (EIB) for projects that contribute to decarbonizing Indonesia's power system. In addition, the EU will earmark a further €25 million in grants and technical assistance.

Other EU-funded projects relevant to the CEPF program in Wallacea are:

- €10 million for the Marine Biodiversity and Support of Coastal Fisheries in the Coral Triangle project (2020-2025), focused on the Sulu-Sulawesi seascape, in particular on the management of fisheries and MPAs in Maluku Utara and Sulawesi Utara.
- €5 million in investment grants and technical assistance for PT SMI, the Indonesian public infrastructure financing bank, to finance infrastructure projects with high social or climate impact directly contribute to the SDGs and the fight against climate change. This grant funding complements a line of credit from AFD (2019-2029).
- Support to blue economy strategic planning, through the development of an Indonesia Blue Economy Index with technical assistance from the EU ARISE+ Indonesia project.
- Promotion of sustainable fisheries, via dialogue on fisheries policies through the Enhanced Regional EU-ASEAN Dialogue Instrument (E-READI) and support to a quality assurance system for fishery product safety.
- Continued support to the Forest Law Enforcement, Governance and Trade (FLEGT) initiative.

The EU also supports initiatives of the ASEAN network, of which Indonesia is a member, including work on transboundary issues such as forest governance, climate change and natural capital, biodiversity and the management of peatlands.

11.1.4 Multilateral funding

Funding from the UNREDD+ fund, the World Bank's FCPF, and the Green Climate Fund is discussed in Chapter 10.

The **World Bank** is implementing the Oceans for Prosperity Project (LAUTRA), which is supported by a US$200 million loan plus US$10 million in grant funding from 2023 to 2028. The project aims to enhance the sustainable management of selected MPAs and coral reef fisheries and improve access to economic opportunities for local communities in target areas. Project components include infrastructure and institutional strengthening for sustainable management of about 20 MPAs and associated fisheries in three target FMAs, expanding economic opportunities in and around MPAs, especially in the tourism, fishery and aquaculture sectors, and improving the government's capacity to mobilize long-term blue financing. The project targets 11 provinces, including nine in Wallacea: Maluku; Maluku Utara; Nusa Tenggara Barat; Nusa Tenggara Timur; Gorontalo; Sulawesi Selatan; Sulawesi Tengah; Sulawesi Utara; and Sulawesi Tenggara. Because the project deploys significant resources across the majority of the marine corridors in the hotspot, there are significant opportunities for sustaining or amplifying innovative approaches demonstrated by CEPF grantees in these corridors.

One of the largest World Bank projects in the environment sector in Indonesia also focuses on marine and coastal ecosystems: the Mangroves for Coastal Resilience (M4CR) project. This project runs from 2022 to 2027, with US$400 in loan and US$15 million in grant financing. The project aims to enhance the management of mangroves and livelihoods of local communities in four selected provinces: Kalimantan Timur; Kalimantan Utara; Sumatra Utara; and Riau. None of these are in Wallacea, although additional provinces may be added during project implementation.

In the terrestrial realm, the World Bank is implementing the Strengthening of Social Forestry in Indonesia (SSF) project, which is supported by a US$95 million loan and a US$14 million GEF grant from 2020 to 2026. The project aims to improve access to forest land use rights and strengthen community management in selected priority areas allocated for social forestry. Project components include policy and institutional strengthening to support social forestry and strengthening community management within social forestry. Four of the six project sites are located in Wallacea: Bima municipality, Bima district and Dompu district in Nusa Tenggara Barat; and Halmahera Barat district in Maluku Utara.

In the agriculture sector, the World Bank is implementing the Agriculture Value Chain Development (ICARE) project, which is supported by a US$100 million loan plus counterpart funding, from 2022 to 2027. The project aims to support environmentally and financially sustainable and inclusive agricultural value chains in nine districts, including four in Wallacea: Lombok Tengah district in Nusa Tenggara Barat; Gowa district in Sulawesi Selatan; district in Sulawesi Tenggara; and Minahasa Utara district in Sulawesi Utara. The promotion of climate-smart agricultural practices and technologies is expected to help improve the productivity of production systems and their resilience to climate change, while farmer groups will be equipped with the skills needed to engage in value chain partnerships.

With US$16 million in funding from the GEF, the World Bank is implementing the Indonesia Sustainable Cities impact project, which runs for 2023 to 2028. The project aims to integrate biodiversity and climate-smart management in the preparation of development

plans and priority capital investments of participating cities, including financing modalities. The project targets five cities across Indonesia, including Bitung in Sulawesi Utara. The project components include integrated spatial planning and urban management, catalyzing integrated investment in priority areas to enhance biodiversity and climate change outcomes, piloting innovative financing approaches and instruments, and policy dialogue and knowledge management.

The World Bank is implementing the Integrated Land Administration and Spatial Planning project, which will run from 2024 to 2029, with US$653 million in loan financing. The project aims to strengthen climate-informed spatial planning, land tenure security and land administration in Indonesia. The project will address a key threat to biodiversity, in the form of weak planning, which allows low-density development in urban fringe areas to encroach areas with high environmental or biodiversity value. This will be done through such approaches as the incorporation of KBAs into spatial plans. This nationwide project will cover the three bioregions of Wallacea: Sulawesi in the first three years of project implementation; Lesser Sundas in the fourth year; and Maluku in the fifth year.

The Dedicated Grant Mechanism for Indigenous Peoples and Local Communities (DGM) was created by representatives of Indigenous Peoples and local communities to enhance their role in forest management and climate action. The DGM included a portfolio of national projects, supported through the World Bank managed Forest Investment Program. In Indonesia, the DGM was implemented through the US$6.5 million project Strengthening Rights and Economies of Adat and Local Communities from 2017 to 2022. The project was executed by the Samdhana Institute, and featured subgrants to strengthen Indigenous People and local community capacity to enhance tenure security and improve livelihoods, as well as support for policy processes and dialogues.

The **GEF** is currently in its eighth replenishment cycle (GEF-8, 2022-2026). Indonesia has a System for Transparent Allocation of Resources (STAR) allocation of US$103.65 million for the period: the largest of any country in the world. Indonesia's STAR allocation comprises US$82.15 million for biodiversity, US$20.05 million for climate change and US$1.45 million for land degradation, continuing the strong focus on biodiversity that was seen over recent funding cycles. At US$9.59 million, Timor-Leste's STAR allocation under GEF-8 was smaller, in absolute terms, than Indonesia's but significantly larger in proportion to national area or population. Timor-Leste's STAR allocation is made up of US$4.00 million for biodiversity, US$3.59 million for land degradation and US$2.00 million for climate change.

Under GEF-7, there was relatively limited investment in terrestrial biodiversity conservation, especially in Wallacea, but more significant investment in marine work. In GEF-8, the balance swung back towards a greater focus on terrestrial biodiversity, with some projects also addressing freshwater biodiversity. Tables 60 and 61 summarize ongoing and planned GEF projects with activities in Wallacea.

Table 60: GEF projects relevant to terrestrial and freshwater conservation in Wallacea

Title	Details	Relevance to Wallacea
Excelling Protected Area Management Effectiveness for Biodiversity Conservation through Landscape Based Approach (ENABLE)	GEF grant: US$6.6 million IA: UNDP Status: Concept Approved	The project aims to enhance biodiversity conservation in protected areas and surrounding landscapes by establishing centers of excellence for landscape-based management at three protected areas, including Bogani-Nani Wartabone National Park in Gorontalo and Sulawesi Utara. These models will be scaled up to two other national parks in Wallacea: Rawa Aopa Watumohai in Sulawesi Tenggara; and Bunaken in Sulawesi Utara.
Spatial-based Natural Forest Planning and Governance for Robust Ecosystems (SPARE)	GEF grant: US$6.2 million IA: UNDP Status: Concept Approved	The project aims to enable the implementation of integrated and harmonized forestry spatial planning and information for enhanced governance, decision-making over, and protection of natural forests (high biodiversity/conservation value ecosystems) outside protected areas. The project will be implemented at the national level and in three target provinces, including Nusa Tenggara Barat.
Local Investment and Action for Climate Resilient, Water Secure and Healthy Farming Communities in Timor-Leste	GEF grant: US$4.4 million IA: FAO Status: Concept Approved	The project aims to enhance water security and climate resilience for rural communities in Timor-Leste through innovative youth and women led nature-based solutions.
Lake Ecosystem Restoration in Indonesia through Integrated Governance, Landscape, and Community-based Approaches	GEF grant: US$7.1 million IA: IFAD Status: Active (2025-2031)	The project aims to protect biodiversity and safeguard the resilience of Indonesia's lake ecosystems by establishing integrated governance systems, empowering local communities with sustainable livelihoods, and enabling national-scale adoption of sustainable lake management practices. The project focuses on three target lake ecosystems, including Lake Limboto in Gorontalo.
Indonesia's Net-Zero and Nature-Positive Acceleration through Integrated Actions in the Energy and Industrial Sectors	GEF grant: US$15.7 million IA: UNDP, UNEP Status: Active (2025-2030)	The project aims to accelerate greenhouse gas emission reductions and enhance biodiversity conservation and promote land restoration through an integrated net-zero nature-positive approach in the energy and industrial sectors. The project supports the development of integrated net-zero and nature-positive policies and governance mechanisms at the national level, including guidelines to align financial sector investments with climate and biodiversity priorities. This could improve the policy context for biodiversity conservation in Wallacea over the long term.
Improving Wetlands Management for Biodiversity and Improved Human-wildlife Coexistence	GEF grant: US$2.7 million IA: CI Status: Active (2025-2030)	The project aims to improve wetland management for biodiversity conservation in Timor-Leste while promoting sustainable livelihoods for local communities.

Title	Details	Relevance to Wallacea
Nature-based Solutions for Intersectoral Nature-positive Development in Timor-Leste	GEF grant: US$2.6 million IA: UNDP Status: Active (2025-2030)	The project aims to promote nature-positive development to reduce ecosystem degradation by valuing nature, and by applying nature-based solutions in the food and tourism sectors in Timor-Leste.
Protection of Biodiversity and Sustainable Land-use in Conservation Landscapes in South Sulawesi, Gorontalo and East Nusa Tenggara	GEF grant: US$7.5 million IA: UNEP Status: Active (2024-2030)	The project aims to protect biodiversity and reduce land degradation in the Wallacea Hotspot through landscape-based conservation action, sustainable land management, and livelihood benefits linked to conservation outcomes. Among other things, the project is developing spatially explicit Integrated Conservation Landscape Plans and promoting their adoption by local government and alignment with budgeting and fiscal support, enhancing agroforestry value-chains in social forestry concessions, and piloting Other Effective Area-based Conservation Measures (OECMs). The project focusses on five high-biodiversity landscapes: Popayato-Paguat in Gorontalo; Lompobattang in Sulawesi Selatan; and Todo-Repok/Ruteng, Alor and East Sumba in Nusa Tenggara Timur.
Adapting to Climate Change and Enabling Sustainable Land Management through Productive Rural Communities in Timor-Leste	GEF grant: US$9.8 million IA: UNEP Status: Active (2023-2028)	The project aims to increase climate resilience and reduce land degradation in priority watersheds in Timor-Leste by strengthening collaborative sustainable land management for increased livelihood resilience and water security of agriculture-based communities following an ecosystem-based adaptation model.
Management of Indonesian and Timor-Leste Transboundary Watersheds (MITLTW)	GEF grant: US$5.0 million IA: CI Status: Active (2023-2028)	The project aims to ensure collaborative management of freshwater ecosystems and protect water, food and livelihood security in the Talau-Loes and Mota Masin basins straddling the border between Indonesia and Timor-Leste on the island of Timor.
Investing in the Komodo Dragon and other Globally Threatened Species in Flores (IN-FLORES)	GEF grant: US$6.3 million IA: UNDP Status: Active (2022-2028)	The project aims strengthen conservation of Komodo dragon and other globally threatened species in Flores, Nusa Tenggara Timur, through integrated approaches across multiple use landscapes-seascapes. Project components include strengthening the enabling environment and introducing new governance models for integrated landscape-seascape management, and improving private sector, community engagement and diversified financing for biodiversity conservation and livelihood improvement.
Strengthening Capacities for Management of Invasive Alien Species (SMIAS) in Indonesia	GEF grant: US$4.4 million IA: FAO Status: Active (2022-2027)	The project aims to safeguard globally significant biodiversity and ecosystem services through improved management of invasive alien species in Indonesia. The project targets two sites, including Bantimurung Bulusaraung National Park in Sulawesi Selatan.

Title	Details	Relevance to Wallacea
Crop Diversity Conservation for Sustainable Use in Indonesia	GEF grant: US$6.2 million IA: FAO Status: Active (2022-2027)	The project aims to strengthen the conservation and sustainable use of globally significant Indonesian crop diversity, in the wild and on-farm, through sustainable practices and improved capacities, as well as strengthened enabling environment and the development of long-term incentive mechanisms. The project targets agricultural areas in three provinces, including one in Wallacea: Maluku Utara.
Seventh Operational Phase of the GEF Small Grants Programme in Indonesia	GEF grant: US$3.6 million IA: UNDP Status: Active (2022-2026)	The GEF Small Grants Programme (SGP) uses small grants to CSOs to build social, economic and socio-ecological resilience through community-based activities for global environmental benefits and sustainable development. The seventh phase of the SGP in Indonesia focuses on four landscapes, three of which are within Wallacea: Sabu Raijua district in Nusa Tenggara Timur; the buffer zone of Nantu-Boliyohuto Wildlife Reserve in Gorontalo; and Balantieng watershed in Sulawesi Selatan.
Indonesia Sustainable Cities Impact Program (see World Bank section above)	GEF grant: US$15.9 million IA: World Bank Status: Active (2022-2027)	The project aims to integrate biodiversity and climate-smart management into the preparation of development plans and priority capital investments of participating cities, including financing modalities. The project targets five cities, including Bitung in Sulawesi Utara.
Accelerating Cleantech Innovation and Entrepreneurship in Start-ups and SMEs in Indonesia	GEF grant: US$1.8 million IA: UNIDO Status: Active (2022-2026)	The project aims to support low-carbon economic growth by promoting clean technology innovations and entrepreneurship through a Cleantech innovation platform and accelerator program. The thematic and geographic focus of the project is open but the start-up and small and medium enterprises that benefit from the project could include ones working to reduce greenhouse gas emissions, sequester carbon and maintain biodiversity within agricultural landscapes.
Strengthening Sustainability in Commodity and Food-Crop Value Chains, Land Restoration and Land Use Governance through Integrated Landscape Management for Multiple Benefits in Indonesia	GEF grant: US$16.2 million IA: UNDP, FAO Status: Active (2021-2027)	The project aims to transform the management of oil palm, cocoa, coffee, and rice-based food systems and landscapes in Indonesia for the generation of multiple environmental benefits. This is achieved by promoting sustainable crop production practices and responsible value chains, and by conserving and restoring natural ecosystems. The focus of the project is on five target provinces, including Sulawesi Selatan.
Catalyzing Optimum Management of Nature Heritage for Sustainability of Ecosystem, Resources and Viability of Endangered Wildlife Species (CONSERVE)	GEF grant: US$6.3 million IA: UNDP Status: Active (2021-2027)	The project aims to strengthen management of multiple use landscapes to enhance biodiversity conservation, generate sustainable land-use and livelihood practices and address illegal wildlife trade. The project focuses on project demonstration sites in the three provinces, one of which is in Wallacea: Moyo island in Nusa Tenggara Barat.

Title	Details	Relevance to Wallacea
Strengthening of Social Forestry in Indonesia (SSF) (see World Bank section above)	GEF grant: US$14.3 million IA: World Bank Status: Active (2020-2026)	The project aims to improve access to forest land use rights and strengthen community management in selected priority areas allocated for social forestry. Four of the six project sites are in Wallacea: Bima municipality, Bima district and Dompu district in Nusa Tenggara Barat; and Halmahera Barat district in Maluku Utara.
Integrated Sound Management of Mercury in Indonesia's Artisanal and Small-scale Gold Mining (ISMIA)	GEF grant: US$6.7 million IA: UNDP Status: Active (2020-2025)	The project aims to reduce or eliminate the use of mercury in the Indonesian artisanal and small-scale gold mining sector through provision of technical assistance, technology transfer, establishment of public private partnerships and facilitating access to financing for the purchase of Mercury-free processing equipment. The project works with 60 artisanal mining groups, in five provinces, including Nusa Tenggara Barat, Gorontalo, Sulawesi Utara and Maluku Utara.
Combatting Illegal and Unsustainable Trade in Endangered Species in Indonesia	GEF grant: US$7.0 million IA: UNDP Status: Active (2017-2024)	The project aims to reduce the volume of unsustainable wildlife trade and the rate of loss of globally significant biodiversity in Indonesia and East and Southeast Asia. In addition to national level policy and capacity support, one of the two project sites is in Wallacea: Bogani-Nani Wartabone National Park in Gorontalo and Sulawesi Utara.
IKAN Adapt: Strengthening the Adaptive Capacity, Resilience and Biodiversity Conservation Ability of Fisheries and Aquaculture-dependent Livelihoods in Timor-Leste	GEF grant: US$4.4 million IA: FAO Status: Active (2022-2027)	The project aims to enable fisheries and aquaculture stakeholders in Timor-Leste to adapt to climate change and manage biodiversity conservation through reducing vulnerabilities, piloting and adopting new practices and technologies and sharing information and knowledge.

Table 61: GEF projects relevant to marine conservation in Wallacea

Title	Amount, implementing agency	Relevance to Wallacea
iCOAST in Indonesia	GEF grant: US$6.0 million IA: UNDP Status: Concept Approved	The project in Indonesia is part of a larger initiative to promote sustainable tourism practices in 14 countries. The project aims to reduce the negative environmental impacts of tourism, including biodiversity loss, while also creating equitable livelihoods for local communities. No information is yet available about the project sites in Indonesia.
Enhancing Co-benefits of Conservation/Protected Area Management through an Inclusive Wildlife-based Ecotourism Strategy (ECOTOURISM)	GEF grant: US$6.2 million IA: UNDP Status: Concept Approved	The project aims to enhance biodiversity conservation and ecosystem resilience in Indonesia's conservation areas through the development and implementation of wildlife-based ecotourism, ensuring inclusive local community engagement and long-term economic benefits. The project will be implemented at five national parks, including Wakatobi National Park in Sulawesi Tenggara.

Title	Amount, implementing agency	Relevance to Wallacea
Indonesia Coral Reef Bond	GEF grant: US$13.8 million IA: World Bank Status: Concept Approved	The project aims to improve coral reef health and conservation outcomes at four target MPAs in eastern Indonesia, including Savu Sea and Selat Pantar (Alor) in Nusa Tenggara Timur.
Sulu-Sulawesi Seascape Approach to Coral Reef Livelihoods (SEACONNECT)	GEF grant: US$6.0 million IA: CI Status: Concept Approved	The project aims to improve sustainability of coral reef resources, fisheries, and the blue economy in the Sulu-Celebes Large Marine Ecosystem (also known as the Sulu-Sulawesi Seascape). The project will be implemented in three countries including Indonesia. Within Indonesia, activities will focus on five provinces, including Sulawesi Tengah, Gorontalo and Sulawesi Utara in Wallacea.
Effectively Managing Networks of Marine Protected Areas in Large Marine Ecosystems in the ASEAN Region (ASEAN ENMAPS)	GEF grant: US$12.5 million IA: UNDP Status: Active (2024-2028)	The project aims to develop and improve the management of networks of MPAs and marine corridors within selected large marine ecosystems in the ASEAN region, for the conservation of globally significant biodiversity and support for sustainable fisheries and other ecosystem goods and services. The project takes place in three countries including Indonesia, where the pilot sites are Kepulauan Togean National Park in Sulawesi Tengah and Wakatobi National Park in Sulawesi Tenggara.
Towards Sustainable and Conversion-free Aquaculture in Indonesian Seas Large Marine Ecosystem (ISLME)	GEF grant: US$4.4 million IA: ADB Status: Active (2023-2028)	The project aims to alter the trajectory towards more sustainable and conversion-free aquaculture production within the Indonesia Seas Large Marine Ecosystem. The project is implemented in Indonesia and Timor-Leste, with a focus on two important commodities: shrimp in Indonesia; and seaweed in Timor-Leste.
Partnerships for Coral Reef Finance and Insurance in Asia and the Pacific	GEF grant: US$1.3 million IA: ADB Status: Active (2022-2026)	The project aims to enable large-scale finance to increase the climate resilience of coastal businesses, communities and livelihoods in selected countries of Asia and the Pacific, through an innovative coral reef financing and insurance model. The project is implemented in four countries including Indonesia, where the pilot sites include Rote Ndao Regency in Nusa Tenggara Timur.
The Meloy Fund: a Fund for Sustainable Small-scale Fisheries in Southeast Asia	GEF grant: US$6.0 million IA: CI Status: Active (2017-2028)	The project aims to improve the conservation of coral reef ecosystems by providing financial incentives to fishing communities in the Philippines and Indonesia to adopt sustainable fishing behaviors and rights-based management regimes, through capital investments in commercially viable enterprises. To date, the Meloy Fund has made investments in 13 companies, including eight with operations in Indonesia. These companies have areas of influence in Nusa Tenggara Timur, Sulawesi Tenggara and Maluku, as well as several provinces outside of Wallacea.

The GEF SGP has operated in Indonesia since 1997, executed by the Jakarta-based NGO Yayasan Bina Usaha Lingkungan (YBUL). The program's sixth phase (2017-2020) focused

grantmaking on four priority areas, three of them in Wallacea: Semau Island, Nusa Tenggara Timur; Wakatobi, Sulawesi Tenggara; and Gorontalo province. For the seventh phase (2022-2026), the SGP focuses on four landscapes, three of them in Wallacea: Sabu Raijua district in Nusa Tenggara Timur; the buffer zone of Nantu-Boliyohuto Wildlife Reserve in Gorontalo; and Balantieng watershed in Sulawesi Selatan. In each case, the SGP works through a local CSO as an umbrella body. The program also channeled funding for Indigenous and community action in response to the COVID-19 pandemic, from the Global Support Initiative for Indigenous Peoples and Community-Conserved Territories and Areas (ICCA-GSI).

The **ADB** is an important source of loans, grants and technical assistance to Indonesia and Timor-Leste, in support of infrastructure, education, health and economic development. The ADB was a partner in the Coral Reef Rehabilitation and Management-Coral Triangle Initiative (COREMAP-CTI) project, together with the World Bank and the GEF. Initiated by the Indonesian Government in 1998, this long-term coral reef management program entered its third phase in 2014, which was supported through a US$46 million loan and an US$8 million GEF grant. The project enabled coastal communities, and the institutions that support them to manage coral reef resources, and associated ecosystems and biodiversity, in a sustainable manner, to increase the economic and social welfare of coastal communities. The project was implemented at 39 sites across Indonesia, including three in Wallacea: Savu Sea MPA in Nusa Tenggara Timur; and Gili Matra and Gili Balu MPAs in Nusa Tenggara Barat.

Ongoing ADB projects relevant to natural resource management in Wallacea include:

- The Rural Resilience and Livelihood Improvement sector project aims to improve climate resilience, water and food security, and livelihood opportunities of rural communities in Manatuto municipality, Timor Leste. The project is supported by a US$6 million grant, approved in 2024.
- The Scaling Up the East Asian-Australasian Flyway Initiative seeks to strengthen institutional capacity, identify and create investment proposals for priority sites and develop a financing mechanism to support the East Asian-Australasian Flyway in the long-term. It is supported by a US$1.7 million package of technical assistance, approved in 2021, which covers 10 countries, including Indonesia. Under the initiative, important sites for migratory waterbirds have been identified along the flyway, including within Wallacea. The initiative is expected to evolve into one or more projects to support conservation and restoration of these sites.
- The Flood Management in Selected River Basins sector project is supporting the government of Indonesia and river-based communities to better manage and mitigate flood risks, including by improving watershed conditions to moderate runoff peaks and soil erosion. The project focuses on two groups of river basins, including one on Ambon Island, Maluku. The project is funded by a US$109 million loan, approved in 2019.

11.1.5 Foundations and funds

The portfolios of funds and philanthropic foundations that support biodiversity conservation in Wallacea are strongly focused on marine ecosystems. Many of them are also active in terrestrial ecosystems but with a geographic focus on the forest and deep-peat regions,

which are of greatest significance for mitigating climate change, in Sumatra, Kalimantan and Papua (i.e., outside of Wallacea).

Bloomberg Philanthropies launched phase II of its Vibrant Oceans Initiative (VOI) in 2018, with a commitment of US$83 million and a focus on 10 countries, including Indonesia. The initiative aims to:

- Promote adoption of high-impact, science-based fisheries and marine protection policies in at least 10 countries.
- Protect at least 50 reef geographies that are projected to be less vulnerable to long-term climate impacts and can repopulate other reefs over time.
- Support at least 20 countries to achieve fishing activity transparency in their national waters.

The priorities are guided by the analysis of priority reefs found in Beyer *et al.* (2018), discussed in Chapters 4 and 12. Under the umbrella of the VOI, Bloomberg Philanthropies, Margaret A. Cargill Philanthropies and the Walton Family Foundation support:

- WCS to do community-based work in Nusa Tenggara Barat, Nusa Tenggara Timur, Sulawesi Utara and Sulawesi Selatan, including MPA development and improvement, near-shore fisheries improvement, alternative livelihoods and capacity-building.
- RARE's work in Sulawesi Tenggara, at the provincial level and in 22 districts, on managed access areas, MPA development and improvement, nearshore fisheries improvement, alternative livelihoods and capacity-building.
- Blue Ventures to support local civil society in Maluku, Maluku Utara and Nusa Tenggara Timur, to help communities manage their fisheries by utilizing temporary closures that provide an immediate benefit from locally led marine management and conservation, as well as capacity-building.

In addition, **Margaret A. Cargill Philanthropies (MACP)** support the following work in Wallacea:

- WWF's community-based work throughout the Sunda-Banda Seascape, including MPA development and improvement, nearshore fisheries improvement, alternative livelihoods, sustainable tourism and capacity-building (US$6 million over three years).
- TNC's community-based work in Sulawesi Tenggara and Nusa Tenggara Timur (plus Kalimantan Timur), including MPA development and improvement, near-shore fisheries improvement, alternative livelihoods, seaweed aquaculture and capacity-building (US$4.2 million over three years).
- Coral Triangle Center to do capacity building for effective management of MPAs and small-scale fisheries in the Sunda-Banda Seascape, Nusa Tenggara Barat (US$750,000 over 3 years).
- Burung Indonesia to support local civil society in Sulawesi Tengah and Sulawesi Selatan, including MPA improvement, alternative livelihoods and capacity building (US$800,000 over three years).

In addition to its support delivered through the VOI, the **Walton Family Foundation** supports:

- TNC and Yayasan Masyarakat dan Perikinan Indonesia (known as MDPI) to support tuna management across the western central Pacific, including in Maluku and Maluku Utara provinces. This involves collecting data on tuna landings, working with district and provincial fisheries agencies to utilize this data to manage tuna, and working to establish Fair Trade communities so that tuna can be labeled and sold as Fair Trade.
- Blue Ventures, which regrants to smaller organizations to implement local management of octopus through seasonal closures in Sulawesi Utara, Sulawesi Tengah, Sulawesi Tenggara, Nusa Tenggara Barat and Nusa Tenggara Timur.

The **David and Lucile Packard Foundation** works with the other partners of the Climate and Land Use Alliance (CLUA; Ford Foundation, Climate Works, Good Energies and Margaret A. Cargill Philanthropies) to coordinate grant-making in support of sustainable land-use, community livelihoods and low-emissions economic development. The foundation makes grants to a large number of CSOs working in Indonesia but the climate focus of the work means that the majority of its grant-making is in Sumatra, Kalimantan and Papua. Nevertheless, the Packard Foundation supports action nationally to address issues such as sustainable palm oil, sustainable local jurisdictions, social forestry and local community land rights, all of them relevant to conservation in Wallacea. The foundation also supports sustainable fisheries and aquaculture, with its activities in the sector in Indonesia focused on developing examples of good fisheries management, informing policy reform and building capacity.

The **John D. and Catherine T. MacArthur Foundation** has made several grants in the 2000s and 2010s, to support community-based MPAs, fisheries management and livelihoods of coastal communities, including to the Indonesia Locally Managed Marine Areas Foundation to support the effective management of LMMAs in eastern Indonesia. Currently, however, the foundation has only one active grant related to Wallacea, in support of the Asia Climate-Smart Landscape Fund. This fund was launched in 2021 by Asia Debt Management Hong Kong Ltd, with the aim of reducing deforestation in Indonesia by making focused investments in responsible commodity production, implementing improved land management practices, and improving livelihoods, especially for women and girls (US$5 million over 10 years).

In addition, many of these foundations collaborate via the Indonesian Marine Funders Collaboration group and via Oceans 5, to improve compliance of fishing boats in support of the government’s campaign against IUU fishing.

The **Ford Foundation** supports climate and social justice, community development and sustainable natural resource management across Indonesia, including grants to Indigenous community organizations in Wallacea. For its community rights and land-use work, the foundation works in alignment with the other members of CLUA. The Ford Foundation also has a particular focus on mitigating the environmental and social impacts of extractive industries. Its current grant portfolio includes support to:

- Badan Registrasi Wilayah Adat for protection of ICCAs in Indonesia to contribute to conservation of nature and biodiversity (US$350,000 over three years).

- Perkumpulan Huma Indonesia for support for Indigenous and local communities to develop and manage customary forest knowledge for the protection of biodiversity at the local, national and global level (US$250,000 over three years).
- Yayasan Penabulu for strengthening the effective engagement of women, youth and other vulnerable groups in sustainable natural resources management in Indonesia (US$520,500 over three years).
- Yayasan Lembaga Pengembangan Ekonomi dan Keuangan for supporting transparency and accountability models for equal distribution of benefits from critical minerals towards environmentally sustainable and inclusive growth in Indonesia (US$250,000 over two years).

The **Indonesian Biodiversity Foundation (KEHATI)** was established in 1994, in the follow-up to the 1992 Rio Earth Summit. KEHATI's resources are invested in an endowment fund, initially capitalized by the US Government, with the proceeds being used to award grants that support biodiversity conservation across forest, agricultural and marine ecosystems. KEHATI currently manages more than US$200 million from multilateral and bilateral donors, private sector partnerships, philanthropies and crowd-funding initiatives. It is the most important Indonesian source of funding for CSOs working on biodiversity conservation.

The **Indonesian Environment Fund (IEF)** is responsible for managing environmental funds. It oversees funds in forestry, energy and mineral resources, carbon trading, environmental services and fisheries, among other environmental areas. The IEF was established under the Ministry of Finance in 2019. The fund's mission includes to promote sustainable environmental protection and management for the wellbeing of current and future generations.

11.1.6 Private sector

Aside from business activities that impact positively or negatively on the environment, the private sector invests in conservation activities through corporate social responsibility (CSR) and similar programs. Laws and regulations require state-owned companies, companies whose operations impact on natural resources (including, specifically, mining, oil and gas companies), to plan, implement and report on social and environmental programs. In Wallacea, there are large CSR programs by Bank Negara Indonesia ('BNI Go Green') and Bank Rakyat Indonesia ('BRI Peduli-Indonesia Lestari') focused on supporting community-level business development, and CSR programs funded by major companies in the extractives sector focused on their operations.

11.2 Interaction of funding mandates and sources

There is strong political leadership for and commitment to conservation in Indonesia, epitomized by Presidential Instruction No. 1/2023, which called for the mainstreaming of biodiversity conservation into sustainable development. Ministries and regional governments were, in turn, instructed to establish policies for this. Funding is supposed to come from central and regional government budgets, which themselves rely on national revenue generation and allocations by the Indonesian legislature. In a country as large as Indonesia, with multiple demands on national and sub-national budgets, inevitably there are shortfalls.

To make up for these shortfalls, Indonesia has been a leader at using innovative conservation financing mechanisms, including:

- Thematic bonds, like Blue Bonds for marine protected areas and Sharia-compliant Green *Sukuk* bonds for climate change mitigation.
- Debt swaps, like the US-funded Tropical Forest and Coral reef Conservation Agreement (TFCCA).
- Impact bonds that link investment returns to conservation results, such as the World Bank-supported Indonesia Coral Bond and the small-scale fisheries impact bond developed by Rare.
- Market mechanisms, like the Indonesia Carbon Exchange, the government-led Corridor Fund for Nature-Based Solutions, which mobilizes private investment for reforestation and mangrove restoration, and the Tropical Landscapes Finance Facility, which works with rubber producers. Indonesia is also a leader in exploring biodiversity credits.

Indonesia participates in the Biodiversity Finance Initiative (BIOFIN), to close national biodiversity funding gaps. The country has also created BPDLH, an agency under the Ministry of Finance, to act as a central financing hub.

Funding for conservation in Wallacea fits within these national-level efforts. Thus, there is the possibility that, while a program for carbon or rubber (possibly focused on Sumatra or Kalimantan) does not directly target Wallacea, it frees up other national budget resources for deployment in the hotspot.

11.3 Gap analysis: terrestrial

Data on large (budget >US$2 million) ongoing and planned projects related to biodiversity conservation in Wallacea were analyzed, to help identify gaps in funding themes and geographies for terrestrial ecosystems (Table 62).

Geographically, the projects are focused on Nusa Tenggara, Sulawesi and Timor-Leste. In Nusa Tenggara, there is a significant concentration of projects in both provinces, with a reasonable distribution among individual islands, with, of course, some islands receiving little or no conservation investment. In Sulawesi, the projects are concentrated in the provinces of Sulawesi Utara, Gorontalo and Sulawesi Selatan, with few projects in Sulawesi Barat and Sulawesi Tenggara and none in Sulawesi Tengah. In addition to those provinces, Maluku Utara and Maluku provinces are both investment gaps. Notably, several large islands in Maluku province currently receive little or no international support for terrestrial biodiversity conservation, including Buru, Seram and Yamdena.

In terms of potential recipients of funds, only the GEF SGP, KEHATI and some philanthropic foundations are directly accessible to local CSOs. Some bilateral and multilateral projects and philanthropic funders support international CSOs (or, in some cases, larger Indonesian CSOs), who may act as funding intermediaries by regranting funds and providing other kinds of support to local CSOs. The other bilateral and multilateral projects are executed directly by the government, and present limited opportunities for local CSOs to fund work on terrestrial biodiversity conservation.

In summary, funding for terrestrial conservation and community-based natural resource management activities remains very limited throughout Wallacea but with particular gaps in Sulawesi Barat, Sulawesi Tengah, Sulawesi Tenggara, Maluku Utara and Maluku, as well as some small island groups in other provinces (which often hold endemic and threatened species). Dedicated funding for CSOs, especially sources accessible to local organizations, remains scarce. Thus, the potential to engage these groups in conservation of terrestrial species and ecosystems remains underrealized.

11.4 Gap analysis: marine

Seventeen large (budget >US$2 million) ongoing and planned projects with relevance to marine conservation in Wallacea were analyzed to help identify funding gaps. These comprise projects funded by eight donors: three bilaterals (four projects); two multilaterals (seven projects); and three foundations (six projects) (Table 63). The analysis suggests that, while funding for marine conservation in Wallacea is much more widely available now than it was at the time of the 2014 ecosystem profile, this funding is not evenly distributed across the hotspot, nor is it equally accessible to local CSOs.

Geographically, the programs are concentrated in Sulawesi Tenggara (eight projects), and Nusa Tenggara Timur and Sulawesi Utara (seven projects each). There is a moderate concentration in Nusa Tenggara Barat, Sulawesi Tengah, Maluku Utara and Maluku (five projects each). Sulawesi Selatan and Gorontalo (three and two projects, respectively) are relative investment gaps, as is the country of Timor-Leste (one project). Sulawesi Barat currently has no large projects on marine conservation at all. However, the programs vary between those with a very broad geographic scope, usually addressing a specific theme over a wide area, and those that are much more focused geographically, often on a handful of target sites or districts. Simple summing of the number of projects in each province or country can give a misleading impression of the level of conservation investment.

Thematically, the projects analyzed here are focused on the management of commercial fisheries, management of MPAs, community-based fisheries conservation and sustainable management of small-scale fisheries. The latter two themes provide more opportunities to engage local CSOs than the former two, which tend to be addressed through projects executed by national government, local government and/or international NGOs.

11.5 Conclusion: a niche for CEPF in Wallacea

The discussion above demonstrates that, while there is significant government and donor funding allocated for biodiversity conservation-related programs in Wallacea, funding is geographically patchy, with government funding being focused on national parks, and international donor funding on a small number of sites and districts. Relatively few projects provide opportunities for local CSOs to access funding. The funding mechanisms that are targeted on CSOs and local groups are limited in volume (e.g., those managed by the Samdhana Institute and KEHATI). In the case of the GEF SGP, they are restricted to a few small geographies.

Given the importance of supporting CSOs to work with local communities for the conservation of globally threatened species and KBAs, there is a clear continuing need for a CEPF-type program that combines accessible funding with support for organizational

development, to enable local CSOs to access and make best use of conservation investment. Over time, some of these organizations may grow in confidence, capacity and credibility, such that they are able to access funding directly from a wider range of national and international sources.

Table 62: Terrestrial conservation and sustainable natural resource management projects in Wallacea

Donor	Type	Project name	Indonesian province										Timor-Leste
			Nusa Tenggara Barat	Nusa Tenggara Timur	Sulawesi Utara	Gorontalo	Sulawesi Tengah	Sulawesi Barat	Sulawesi Selatan	Sulawesi Tenggara	Maluku Utara	Maluku	
Germany	Bilateral	Forest Program IV						X	X				
Germany	Bilateral	Forest Program V		X									
World Bank	Multilateral	Strengthening of Social Forestry in Indonesia (SSF)	X								X		
World Bank	Multilateral	Agriculture Value Chain Development (ICARE)	X		X				X	X			
World Bank	Multilateral	Indonesia Sustainable Cities			X								
GEF	Multilateral	Excelling Protected Area Management Effectiveness for Biodiversity Conservation through Landscape Based Approach (ENABLE)			X	X				X			
GEF	Multilateral	Spatial-based Natural Forest Planning and Governance for Robust Ecosystems (SPARE)	X										
GEF	Multilateral	Local Investment and Action for Climate Resilient, Water Secure and Healthy Farming Communities in Timor-Leste											X
GEF	Multilateral	Lake Ecosystem Restoration in Indonesia through Integrated Governance, Landscape, and Community-based Approaches				X							
GEF	Multilateral	Improving Wetlands Management for Biodiversity and Improved Human-wildlife Coexistence											X
GEF	Multilateral	Nature-based Solutions for Intersectoral Nature-positive Development in Timor-Leste											X
GEF	Multilateral	Protection of Biodiversity and Sustainable Land-use in Conservation Landscapes in South Sulawesi, Gorontalo and East Nusa Tenggara		X		X			X				
GEF	Multilateral	Adapting to Climate Change and Enabling Sustainable Land Management through Productive Rural Communities in Timor-Leste											X
GEF	Multilateral	Management of Indonesian and Timor-Leste Transboundary Watersheds (MITLTW)		X									X
GEF	Multilateral	Investing in the Komodo Dragon and other Globally Threatened Species in Flores (IN-FLORES)		X									
GEF	Multilateral	Strengthening Capacities for Management of Invasive Alien Species (SMIAS) in Indonesia							X				

Donor	Type	Project name	Indonesian province										Timor-Leste
			Nusa Tenggara Barat	Nusa Tenggara Timur	Sulawesi Utara	Gorontalo	Sulawesi Tengah	Sulawesi Barat	Sulawesi Selatan	Sulawesi Tenggara	Maluku Utara	Maluku	
GEF	Multilateral	Crop Diversity Conservation for Sustainable Use in Indonesia			X								
GEF	Multilateral	Seventh Operational Phase of the GEF Small Grants Programme in Indonesia		X		X			X				
GEF	Multilateral	Strengthening Sustainability in Commodity and Food-Crop Value Chains, Land Restoration and Land Use Governance through Integrated Landscape Management for Multiple Benefits in Indonesia							X				
GEF	Multilateral	Catalyzing Optimum Management of Nature Heritage for Sustainability of Ecosystem, Resources and Viability of Endangered Wildlife Species (CONSERVE)	X										
GEF	Multilateral	Integrated Sound Management of Mercury in Indonesia's Artisanal and Small-scale Gold Mining (ISMIA)	X		X	X					X		
GEF	Multilateral	Combatting Illegal and Unsustainable Trade in Endangered Species in Indonesia			X	X							
GEF	Multilateral	IKAN Adapt: Strengthening the Adaptive Capacity, Resilience and Biodiversity Conservation Ability of Fisheries and Aquaculture-dependent Livelihoods in Timor-Leste											X
ADB	Multilateral	Rural Resilience and Livelihood Improvement											X
ADB	Multilateral	Flood Management in Selected River Basins										X	

Table 63: Marine sector donor-funded programs in Wallacea analyzed for the gap analysis

Donor	Type	Project name	Indonesian province										Timor-Leste
			Nusa Tenggara Barat	Nusa Tenggara Timur	Sulawesi Utara	Gorontalo	Sulawesi Tengah	Sulawesi Barat	Sulawesi Selatan	Sulawesi Tenggara	Maluku Utara	Maluku	
Germany	Bilateral	Marine Biodiversity and Coastal Livelihoods in Sulawesi/Coral Triangle	X		X								
Germany	Bilateral	Marine Biodiversity and Support of Coastal Fisheries in the Coral Triangle			X						X		
Japan	Bilateral	Project for Promoting Sustainable Fisheries Development in Outer Islands of Indonesia									X	X	
EU	Bilateral	Marine Biodiversity and Support of Coastal Fisheries in the Coral Triangle			X						X		
World Bank	Multilateral	Oceans for Prosperity Project (LAUTRA)	X	X	X	X	X		X	X	X	X	
GEF	Multilateral	Enhancing Co-benefits of Conservation/Protected Area Management through an Inclusive Wildlife-based Ecotourism Strategy (ECOTOURISM)								X			
GEF	Multilateral	Indonesia Coral Reef Bond		X									
GEF	Multilateral	Sulu-Sulawesi Seascape Approach to Coral Reef Livelihoods (SEACONNECT)			X	X	X						
GEF	Multilateral	Effectively Managing Networks of Marine Protected Areas in Large Marine Ecosystems in the ASEAN Region (ASEAN ENMAPS)					X			X			
GEF	Multilateral	Towards Sustainable and Conversion-free Aquaculture in Indonesian Seas Large Marine Ecosystem (ISLME)											X
GEF	Multilateral	The Meloy Fund: a Fund for Sustainable Small-scale Fisheries in Southeast Asia		X						X		X	
VOI	Foundation	WCS's work community-based work in Nusa Tenggara and Sulawesi	X	X	X				X				
VOI	Foundation	RARE's work in Sulawesi Tenggara								X			
MACP	Foundation	WWF's work in the Sunda-Banda Seascape	X	X			X		X	X		X	
MACP	Foundation	TNC's work in Nusa Tenggara and Sulawesi		X						X			
Walton	Foundation	TNC and MDPI's work on tuna management									X	X	
Walton	Foundation	Blue Venture's work on octopus management	X	X	X		X			X			

12. CEPF INVESTMENT NICHE

CEPF's investment niche is defined by existing threats and opportunities, placed within the context of ongoing work by government and donors, informed by the capacity of Indonesian and Timorese civil society, and built on experience from the first two phases of implementation.

The threats faced by the marine and terrestrial environments in Wallacea are multi-dimensional. The first two phases demonstrated that local CSOs can successfully work with local communities and government to address unsustainable exploitation of natural resources. In doing so, they support the aims of local government working to achieve national targets. This community-based work, grounded in participatory approaches and an understanding of local culture, should be the central focus of CEPF's program in Wallacea going forward. Conservation interventions at the community level can respond effectively to hunting and collecting, local agriculture and livestock, small-scale logging, and unsustainable small-scale fishing, which constitute four of the five most prominent threats at KBAs (Table 50, Chapter 9).

Other threats (such as mining, oil and gas production, and industrial agriculture and forestry) require long-term change over a larger geographical scale and engagement with a diverse group of stakeholders. Problems on this scale are unlikely to be tackled through small grants to local CSOs. Rather, they require longer-term investment in organizational development, to enable the emergence of confident, credible CSOs able to enter into cross-sector collaborations with partners from the public and private sectors. Several other large donor projects are also addressing these issues, working directly with national authorities, and CEPF grantees should always be encouraged to look for opportunities for synergy with these projects, rather than attempting stand-alone initiatives.

Achieving wide-ranging local civil society participation in effective conservation is not just a question of offering grants. The first ecosystem profile identified that most CSOs were focused on human welfare and rights issues, and that understanding and capacity for connecting these issues with environmental ones was limited. Before any grants were made, the RIT embarked on a program of promotion, which helped local CSOs to articulate the links between their priorities and those of CEPF, and the result was many creative and successful projects. Once grants were made, CSO capacity was reinforced by capacity building delivered by organizations with extensive practical experience and by a group specializing in organizational development. The design of the capacity building program was responsive to the needs of local CSOs and was different in each funding area. Capacity building was closely linked to networking and encouraging collaboration between grantees. Pairing grant support with dedicated capacity building in this way is crucial to helping deliver successful projects and to increasing the long-term sustainability of local CSOs.

A key focus for capacity building in the third phase will be to promote lessons from the previous phases on the role of a grantee as a catalyst for collaboration, within a community or among communities, private businesses and local authorities. Facilitating inclusive approaches within communities can allow agreement on local rules and practices, often leading to ongoing support through village regulations and budgets. Building trust and opening communication channels between communities and authorities, for example to report illegal fishing or mining, can lead to the community being consulted, involved and supported by local authorities.

13. CEPF INVESTMENT STRATEGY AND PROGRAM FOCUS

The resources of any donor or funder are limited, as is the case for CEPF. Defining an investment niche and setting clear priorities allows CEPF to avoid spreading resources too thinly and maximizes the chance for success. To maximize the contribution of CEPF investment to the conservation of global biodiversity, the full lists of globally threatened species, KBAs and conservation corridors in the hotspot (Chapter 5) were refined into a focused set of priority outcomes (priority species, sites, clusters and corridors) for investment over a five-year period. The purpose of selecting priority sites, clusters and corridors is to enable investment in site-based and landscape-scale conservation to focus on the highest priority geographies. The purpose of selecting priority species is to enable investments in species-focused conservation to be directed at globally threatened species whose conservation needs cannot adequately be addressed by general habitat protection (site-scale or landscape-scale) alone. To inform the type of interventions to be supported by CEPF, thematic priorities for grant making were defined, in the form of strategic directions with subordinate investment priorities.

13.1 Priority species

Chapter 5 on Conservation Outcomes identifies 728 globally threatened species in Wallacea. Some of these species will be effectively conserved through site-based approaches, such as protected areas. Others, however, are directly targeted for exploitation, or are vulnerable for other reasons. In these cases, species-specific action may be needed, which could include introducing and/or enforcing regulations on offtake, restrictions on fishing gear to control by-catch, or campaigns to reduce illegal trafficking.

Six criteria were used to identify priority species for CEPF investment: (i) IUCN Red List status; (ii) listing on a CITES appendix; (iii) legal protected status in Indonesia/Timor-Leste; (iv) current direct threats; (v) mobility; and (vi) capacity and interest of local civil society to take conservation action for the species. Mobility refers to the ecological characteristics of the species in terms of its mobility or limitation to one or a few habitats. It is assumed that less mobile species will be more effectively protected through site-based conservation action, and so are a lower priority for species-focused action. A simple scoring system was applied using each of the above criteria, producing a list of 23 terrestrial and freshwater species, and 37 marine species (Tables 64 and 65).

The list of priority terrestrial species comprises six mammals, 13 birds and four reptiles. The mammals are made up of species endemic to Sulawesi and its offshore islands, which face significant threats from hunting for local consumption. Among the birds, two megapode species, maleo and Moluccan scrubfowl, also face similar threats: their eggs are over-collected for food. The other bird species comprise parrots and songbirds, which are threatened by collection for the pet trade (domestic and international).

The list of priority marine species comprises one mammal, five reptiles, 22 fishes and nine sea cucumbers. The mammal, dugong, is threatened by targeted and accidental capture and loss of seagrass meadows. The reptiles comprise sea turtles, which are threatened by over-harvesting of their eggs, as well as targeted and accidental capture of adults and incompatible development (e.g., of tourism resorts) on nesting beaches. The other species comprise a mix of fishes and sea cucumbers, which are severely threatened by targeted fishing and accidental bycatch by the fishing industry.

Table 64: Priority terrestrial and freshwater species

No.	Group	Latin name	Common name	IUCN status
1	Mammals	*Babyrousa babyrussa*	Hairy babirusa	VU
2	Mammals	*Babyrousa celebensis*	North Sulawesi babirusa	VU
3	Mammals	*Babyrousa togeanensis*	Togean babirusa	EN
4	Mammals	*Bubalus depressicornis*	Lowland anoa	EN
5	Mammals	*Bubalus quarlesi*	Mountain anoa	EN
6	Mammals	*Macaca nigra*	Celebes crested macaque	CR
7	Birds	*Cacatua alba*	White cockatoo	EN
8	Birds	*Cacatua moluccensis*	Salmon-crested cockatoo	EN
9	Birds	*Cacatua sulphurea*	Yellow-crested cockatoo	CR
10	Birds	*Eclectus cornelia*	Sumba eclectus	EN
11	Birds	*Eclectus riedeli*	Tanimbar eclectus	VU
12	Birds	*Eos histrio*	Red-and-blue lory	EN
13	Birds	*Eulipoa wallacei*	Moluccan scrubfowl	VU
14	Birds	*Geokichla interpres*	Chestnut-capped thrush	EN
15	Birds	*Gracula venerata*	Tenggara hill myna	EN
16	Birds	*Lorius domicella*	Purple-naped lory	EN
17	Birds	*Lorius garrulus*	Chattering lory	VU
18	Birds	*Macrocephalon maleo*	Maleo	CR
19	Birds	*Trichoglossus forsteni*	Sunset lorikeet	EN
20	Reptiles	*Chelodina mccordi*	Snake-necked turtle	CR
21	Reptiles	*Cuora amboinensis*	Southeast Asian box turtle	EN
22	Reptiles	*Indotestudo forstenii*	Forsten's tortoise	CR
23	Reptiles	*Leucocephalon yuwonoi*	Sulawesi forest turtle	CR

Table 65: Priority marine species

No.	Group	Latin name	Common name	IUCN status
1	Mammals	*Dugong dugon*	Dugong	VU
2	Reptiles	*Caretta caretta*	Loggerhead turtle	VU
3	Reptiles	*Chelonia mydas*	Green sea turtle	EN
4	Reptiles	*Dermochelys coriacea*	Leatherback sea turtle	VU
5	Reptiles	*Eretmochelys imbricata*	Hawksbill sea turtle	CR
6	Reptiles	*Lepidochelys olivacea*	Olive ridley sea turtle	VU
7	Fishes	*Alopias pelagicus*	Pelagic thresher shark	EN
8	Fishes	*Alopias superciliosus*	Bigeye thresher shark	VU
9	Fishes	*Anoxypristis cuspidata*	Narrow sawfish	CR
10	Fishes	*Carcharhinus falciformis*	Silky shark	VU
11	Fishes	*Carcharhinus hemiodon*	Pondicherry shark	CR
12	Fishes	*Carcharhinus longimanus*	Oceanic whitetip shark	CR
13	Fishes	*Cetorhinus maximus*	Basking shark	EN
14	Fishes	*Glaucostegus typus*	Giant guitarfish	CR

No.	Group	Latin name	Common name	IUCN status
15	Fishes	*Isurus oxyrinchus*	Shortfin mako shark	EN
16	Fishes	*Isurus paucus*	Longfin mako shark	EN
17	Fishes	*Mobula eregoodoo*	Longhorned pygmy devil ray	EN
18	Fishes	*Mobula kuhlii*	Shortfin devil ray	EN
19	Fishes	*Mobula mobular*	Giant devil ray	EN
20	Fishes	*Mobula tarapacana*	Sicklefin devil ray	EN
21	Fishes	*Mobula thurstoni*	Bentfin devil ray	EN
22	Fishes	*Pristis pristis*	Largetooth sawfish	CR
23	Fishes	*Pristis zijsron*	Longcomb sawfish	CR
24	Fishes	*Rhina ancylostoma*	Bowmouth guitarfish	CR
25	Fishes	*Rhincodon typus*	Whale shark	EN
26	Fishes	*Rhynchobatus australiae*	White-spotted guitarfish	CR
27	Fishes	*Sphyrna lewini*	Scalloped hammerhead shark	CR
28	Fishes	*Sphyrna mokarran*	Great hammerhead shark	CR
29	Sea cucumber	*Actinopyga echinites*	Brownfish	VU
30	Sea cucumber	*Actinopyga mauritiana*	Surf redfish	VU
31	Sea cucumber	*Actinopyga miliaris*	Hairy blackfish	VU
32	Sea cucumber	*Holothuria fuscogilva*	White teatfish	VU
33	Sea cucumber	*Holothuria lessoni*	Golden sandfish	EN
34	Sea cucumber	*Holothuria scabra*	Sandfish	EN
35	Sea cucumber	*Holothuria whitmaei*	Teated sea cucumber	EN
36	Sea cucumber	*Stichopus herrmanni*	Hermann's sea cucumber	VU
37	Sea cucumber	*Thelenota ananas*	Pineapple sea cucumber	EN

13.2 Geographic priorities

13.2.1 Priority terrestrial KBA clusters

Many terrestrial KBAs are small and, if not necessarily contiguous, are often nearby to one another. Consequently, they can be arranged as biogeographic "clusters", which reflect how single projects or portfolios of projects might work across multiple KBAs in a coordinated manner, and, thereby, provide an organizing principle for partner engagement, calls for proposals and portfolio management functions by CEPF and the RIT. To a greater or lesser extent, terrestrial KBA clusters ensure ecological connectivity among KBAs, which is important for the conservation of landscape species and for delivery of ecosystem services important to human populations. Conservation action at the level of KBA clusters requires dealing with multiple stakeholders and issues over a large area. For this reason, it is unlikely to be effective for CEPF to fund corridor-level conservation actions in areas where there are no site-based actions. For this reason, the KBAs within the priority terrestrial KBA clusters are automatically considered priority sites.

During the preparation of the original ecosystem profile in 2014, the KBAs in the Wallacea Hotspot were grouped into 26 clusters and ranked. This exercise was repeated during an expert roundtable meeting in August 2025. For the 2025 exercise, the Togean and Peleng-Banggai clusters were combined, to form the Togean-Banggai cluster, bringing down the

total number of clusters to 25 (Figure 21). The number of criteria used for the ranking exercise increased from five to six (Table 66).

Table 66: Scores and criteria for ranking terrestrial KBA clusters

Criterion	Low	Medium	High
Biodiversity score, based on the biological ranking of KBAs presented in Section 5.2.2	1	2	3
Threat score, based on severity of threats to terrestrial and freshwater biodiversity	1	2	3
Stakeholder commitment score, based on political support from local administration and other authorities at village, district and provincial levels	1	2	3
CSO capacity score, based on capacity of local CSOs with programs in the cluster to absorb funding and implement successful projects	1	2	3
Local stewardship score, based on capacity of local and adat communities to engage in conservation, including the presence of customary rules and practices for forest resource management	1	2	3
Funding need score, based an assessment of availability of conservation funding accessible to local CSOs	1	2	3

Table 67 and Figure 21 show the results of the 2025 ranking exercise for terrestrial KBA clusters, with the selected priority corridors highlighted. Four clusters received the highest score (14 point), six received one point fewer (13 points) and two received two points fewer (12 points). These 12 KBA clusters were selected as priorities for CEPF investment, as explained in the section below. They comprise eight clusters in the Sulawesi bioregion, two in the Maluku bioregion and two in the Lesser Sundas bioregion.

The highest-ranked KBA clusters are all located in the Sulawesi bioregion. The Sangihe-Talaud cluster remains a high priority due to the presence of endemic and highly threatened species on both island groups. In particular, IDN012 Gunung Sahendaruman on Sangihe is of extreme importance for the protection of single-site endemic species, including four Critically Endangered bird species, while the KBAs on Talaud island are the only home for the Endangered red-and-blue lory (*Eos histrio*). One challenge to working in this corridor is low CSO capacity, due to it comprising islands off the mainland of Sulawesi, where there are few local CSOs. The Poso cluster is also important for endemic and highly threatened species, including three Critically Endangered fishes known only from IDN073 Danau Poso. This cluster was assessed as having medium CSO capacity and high funding need. Meanwhile, the Lindu cluster which stretches from IDN067 Lore Lindu to IDN066 Pegunungan Tokalekaju, is also a center of endemism, with some highly restricted Critically Endangered species, such as the shrimp *Caridina linduensis*. Compared with the previous two clusters, the Lindu cluster has high CSO capacity but relatively low need for funding. The Sulawesi Selatan cluster has similarly high CSO capacity but was assessed as having relatively low stakeholder commitment to conservation, in contrast to the other highest priority clusters. This cluster is also important for endemic and highly threatened species, including the Critically Endangered ginger *Etlingera doliiformis*, which is known only from IDN138 Karaeng-Lompobattang.

The next highest-ranked KBA clusters comprise three in the Sulawesi bioregion (Minahasa, Sulawesi Timur and Malili), two in the Maluku bioregion (Halmahera and Seram) and one in the Lesser Sundas bioregion (Sumba). All these clusters have significant terrestrial and freshwater biological importance. The Minahasa cluster currently only has patches of mountain natural forests isolated by vast stretches of farms and housing, although these forest "islands" still host some endemic and threatened species. The Sulawesi Timur, Malili and Halmahera clusters are all densely forested landscapes, with high levels of terrestrial

and freshwater biodiversity. They currently face severe threats of mining, mostly nickel. The Seram cluster supports important populations of parrot species, which face severe threats from poaching and illegal trade. The cluster also contains several single-site endemic species, such as the Critically Endangered tree *Cryptocarya ceramica*, which is found only at IDN212 Manusela. KBAs in the Sumba cluster continue to suffer from severe drought and occasional fires and locust plagues, due to expanding savanna vegetation, disappearing forests and climate change.

Table 67: Prioritization of terrestrial KBA clusters in Wallacea for CEPF investment

Name	Biodiversity score	Threat score	Stakeholder commitment score	CSO capacity score	Local stewardship score	Funding need score	Total
Sulawesi bioregion							
Sangihe-Talaud	3	3	3	1	2	2	**14**
Minahasa	2	3	3	1	2	2	**13**
Bolaang	2	2	3	1	1	2	**11**
Toli-Toli	1	2	1	1	1	1	**7**
Lindu	3	2	2	3	3	1	**14**
Poso	3	2	2	2	2	3	**14**
Malili	3	3	1	2	1	3	**13**
Sulawesi Timur	2	3	2	1	2	3	**13**
Togean-Banggai	2	2	2	1	2	3	**12**
Sulawesi Tenggara	2	3	1	1	1	3	**11**
Latimojong-Mambuliling	3	2	1	2	1	1	**10**
Sulawesi Selatan	3	3	1	3	2	2	**14**
Maluku bioregion							
Halmahera	3	3	1	2	1	3	**13**
Obi	3	3	1	1	1	1	**10**
Sula	2	3	1	1	1	1	**9**
Buru	2	2	1	1	1	1	**8**
Seram	3	2	1	2	2	3	**13**
Kai	2	1	2	1	2	3	**11**
Tanimbar	2	1	1	1	1	1	**7**
Letti	1	1	1	1	1	1	**6**
Lesser Sundas bioregion							
Lombok	2	1	2	2	2	2	**11**
Sumbawa	2	3	1	1	1	3	**11**
Flores	3	2	2	2	2	1	**12**
Sumba	2	2	2	2	2	3	**13**
Timor	2	1	2	2	2	1	**10**

Notes: Priority corridors for funding are shaded.

The final two priority KBA clusters are Togean-Banggai in the Sulawesi bioregion and Flores in the Lesser Sundas bioregion. Both clusters contain unique ecosystems with several

endemic birds and mammals, although not many of those are CR species (in comparison to the higher ranked clusters). The Togean-Banggai cluster received a slightly lower score than the other priority clusters, because there are not many local CSOs present there. Flores, on the other hand, is home to a robust social movement, especially related to rural development and natural resource rights but was considered to have a lower need for funding.

It should be noted that the Timor cluster, which spans the Indonesian and East Timorese parts of the island of Timor, was ranked relatively low, compared with other clusters. This cluster was assessed as having moderate biodiversity importance and low threat level and funding need, in comparison with the other clusters. Consequently, no geographic priorities for CEPF investment were identified in Timor-Leste, although CSOs in the country are potentially eligible to receive support from CEPF to work on priority species or other aspects of the investment strategy.

13.2.2 Priority terrestrial sites

The 12 priority terrestrial KBA clusters contain 134 KBAs, which were automatically considered priority sites. Tables 68-70 show the priority terrestrial sites by bioregion: Sulawesi, comprising all the provinces on that island; Maluku, comprising the provinces of Maluku Utara and Maluku; and the Lesser Sundas, comprising the provinces of Nusa Tenggara Barat and Nusa Tenggara Timur plus Timor-Leste. It is recognized that, within KBA clusters, many KBAs are small or adjacent, meaning that a single grant may address multiple sites. The priority terrestrial sites cover a combined area of 3,957,816 ha, equivalent to 45 percent of the total area of terrestrial KBAs in the hotspot. They include 26 of the 40 top-ranked KBAs based on vulnerability and irreplaceability scores (Table 20).

Table 68: Priority terrestrial sites in the Sulawesi bioregion

No.	KBA code	KBA name	KBA cluster	Area (ha)
1	IDN003	Karakelang Utara	Sangihe-Talaud	32,365
2	IDN004	Karakelang Selatan	Sangihe-Talaud	6,463
3	IDN005	Pulau Salibabu	Sangihe-Talaud	8,966
4	IDN007	Pulau Kabaruan	Sangihe-Talaud	9,377
5	IDN010	Gunung Awu	Sangihe-Talaud	3,056
6	IDN011	Tahuna	Sangihe-Talaud	2,237
7	IDN012	Gunung Sahendaruman*	Sangihe-Talaud	4,401
8	IDN015	Pulau Siau*	Sangihe-Talaud	11,635
9	IDN019	Likupang	Minahasa	847
10	IDN021	Mawori	Minahasa	3,870
11	IDN022	Tangkoko Dua Sudara	Minahasa	9,526
12	IDN024	Lembeh	Minahasa	1,716
13	IDN025	Gunung Klabat	Minahasa	3,540
14	IDN027	Danau Tondano*	Minahasa	6,408
15	IDN028	Soputan–Manimporok	Minahasa	9,908
16	IDN029	Mahawu–Masarang*	Minahasa	899
17	IDN030	Gunung Lokon	Minahasa	3,611
18	IDN031	Gunung Manembo-nembo	Minahasa	4,843
19	IDN061	Gunung Sojol	Lindu	94,183

No.	KBA code	KBA name	KBA cluster	Area (ha)
20	IDN062	Siraro	Lindu	855
21	IDN064	Pasoso	Lindu	18,752
22	IDN066	Pegunungan Tokalekaju*	Lindu	391,608
23	IDN067	Lore Lindu*	Lindu	250,111
24	IDN069	Tambu	Lindu	10,043
25	IDN071	Lariang	Lindu	7,160
26	IDN072	Pambuang	Lindu	162,954
27	IDN073	Danau Poso*	Poso	68,203
28	IDN074	Morowali*	Sulawesi Timur	277,238
29	IDN075	Gunung Lumut	Sulawesi Timur	94,226
30	IDN076	Tanjung Colo	Sulawesi Timur	3,456
31	IDN078	Kepulauan Togean	Togean–Banggai	76,396
32	IDN080	Bakiriang	Sulawesi Timur	72,330
33	IDN082	Labobo-Bangkurung	Togean–Banggai	18,431
34	IDN083	Kokolomboi	Togean–Banggai	50,142
35	IDN084	Bajomote–Pondipondi	Togean–Banggai	51,578
36	IDN085	Timbong	Togean–Banggai	22,618
37	IDN086	Balantak*	Togean–Banggai	63,714
38	IDN095	Feruhumpenai–Matano*	Malili	139,781
39	IDN096	Danau Mahalona*	Malili	5,106
40	IDN097	Danau Towuti*	Malili	95,062
41	IDN130	Danau Tempe	Sulawesi Selatan	31,362
42	IDN131	Pallime	Sulawesi Selatan	5,326
43	IDN133	Cani Sirenreng	Sulawesi Selatan	14,136
44	IDN134	Bantimurung Bulusaraung	Sulawesi Selatan	46,723
45	IDN135	Bulurokeng	Sulawesi Selatan	7,055
46	IDN137	Komara	Sulawesi Selatan	29,502
47	IDN138	Karaeng–Lompobattang*	Sulawesi Selatan	32,077
48	IDN357	Malili*	Malili	18,278
49	IDN360	Danau Tiu*	Malili	1,090
50	IDN363	Gunung Hek*	Sulawesi Timur	5,550

Note: * = Top-ranked KBA based on vulnerability and irreplaceability scores.

Table 69: Priority terrestrial sites in the Maluku bioregion

No.	KBA code	KBA name	KBA cluster	Area (ha)
1	IDN145	Morotai*	Halmahera	120,940
2	IDN147	Pulau Rao	Halmahera	6,019
3	IDN149	Galela	Halmahera	2,027
4	IDN150	Gunung Dukono	Halmahera	27,620
5	IDN153	Halmahera Timur	Halmahera	186,542
6	IDN154	Hutan Bakau Dodaga	Halmahera	1,199
7	IDN156	Kao	Halmahera	2,578
8	IDN158	Gamkonora	Halmahera	43,546

No.	KBA code	KBA name	KBA cluster	Area (ha)
9	IDN160	Tanah Putih	Halmahera	5,356
10	IDN161	Rawa Sagu Ake Jailolo	Halmahera	862
11	IDN163	Ternate*	Halmahera	4,546
12	IDN164	Tidore	Halmahera	3,439
13	IDN165	Aketajawe*	Halmahera	84,590
14	IDN167	Dote-Kobe	Halmahera	14,066
15	IDN170	Pulau Kayoa	Halmahera	8,516
16	IDN171	Kasiruta	Halmahera	10,956
17	IDN172	Yaba	Halmahera	10,184
18	IDN173	Gorogoro	Halmahera	13,084
19	IDN174	Saketa	Halmahera	8,536
20	IDN177	Tutupa	Halmahera	8,322
21	IDN178	Gunung Sibela*	Halmahera	27,832
22	IDN179	Mandioli	Halmahera	6,126
23	IDN199	Pulau Buano*	Seram	13,595
24	IDN200	Gunung Sahuwai	Seram	25,965
25	IDN201	Luhu	Seram	4,944
26	IDN202	Tullen Batae	Seram	5,095
27	IDN203	Pulau Kassa	Seram	64
28	IDN204	Pegunungan Paunusa	Seram	60,060
29	IDN205	Gunung Salahutu	Seram	10,224
30	IDN207	Leitimur*	Seram	18,897
31	IDN210	Haruku	Seram	7,997
32	IDN211	Saparua	Seram	1,892
33	IDN212	Manusela*	Seram	251,231
34	IDN213	Waebula	Seram	64,639
35	IDN214	Tanah Besar	Seram	50,004

Note: * = Top-ranked KBA based on vulnerability and irreplaceability scores.

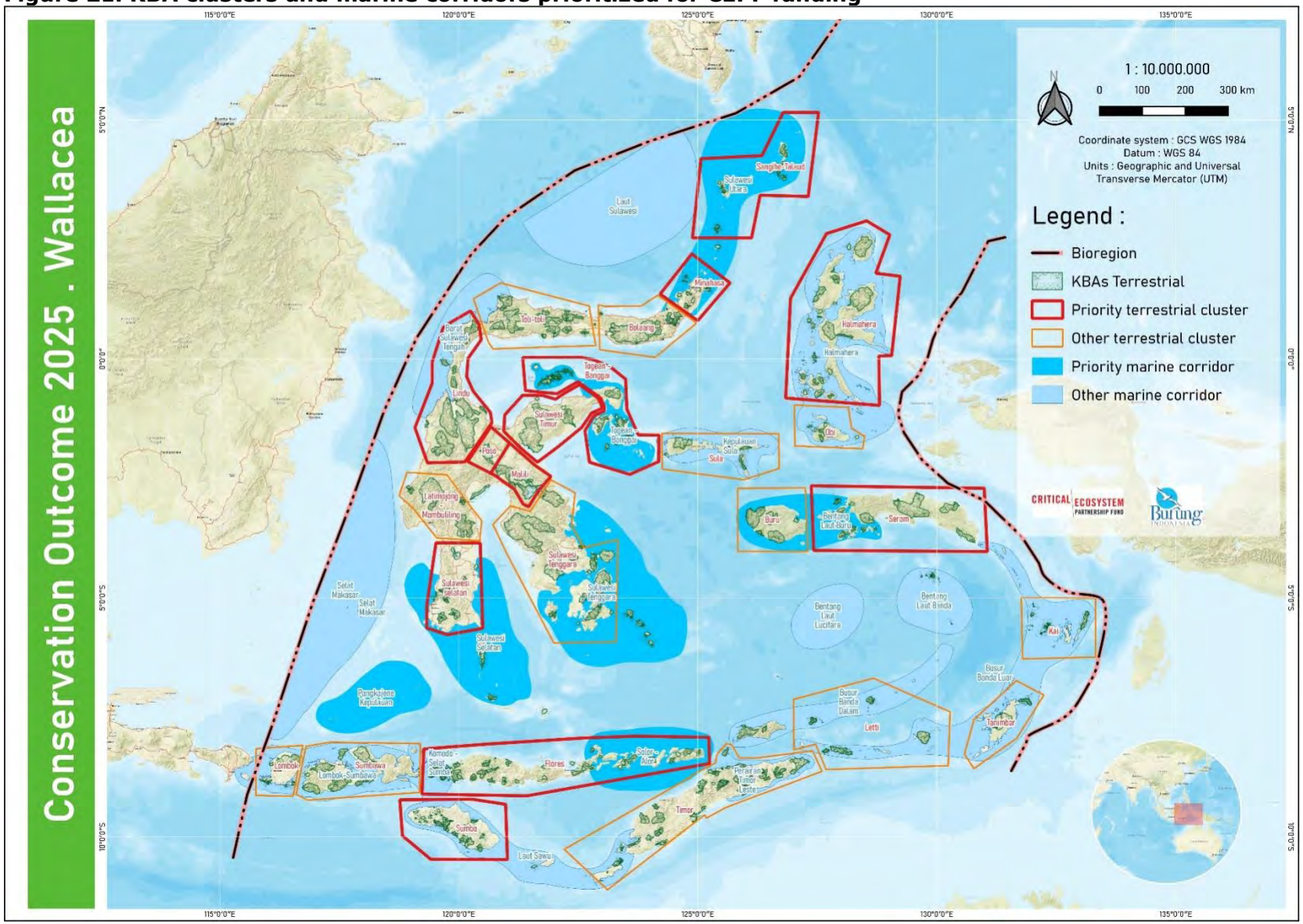
Table 70: Priority terrestrial sites in the Lesser Sundas bioregion

No.	KBA code	KBA name	KBA cluster	Area (ha)
1	IDN257	Rokoraka–Matalombu	Sumba	3,416
2	IDN258	Cambaka	Sumba	836
3	IDN259	Danggamangu	Sumba	500
4	IDN260	Yawila	Sumba	3,980
5	IDN261	Lamboya	Sumba	1,747
6	IDN262	Poronumbu	Sumba	1,778
7	IDN264	Kaliasin	Sumba	191
8	IDN265	Lokusobak	Sumba	2,907
9	IDN266	Baliledo	Sumba	810
10	IDN267	Pahudu Tilu	Sumba	526
11	IDN268	Manupeu Tanadaru*	Sumba	50,647
12	IDN271	Tarimbang	Sumba	12,378

No.	KBA code	KBA name	KBA cluster	Area (ha)
13	IDN272	Lai Kayambi	Sumba	6,465
14	IDN273	Praipaha Mandahu	Sumba	2,158
15	IDN274	Yumbu–Kandara	Sumba	7,861
16	IDN275	Laiwanggi Wanggameti	Sumba	49,096
17	IDN277	Tanjung Ngunju	Sumba	14,410
18	IDN279	Luku Melolo	Sumba	5,595
19	IDN280	Komodo–Rinca	Flores	60,767
20	IDN282	Wae Wuul	Flores	4,451
21	IDN283	Nggorang Bowosie	Flores	13,633
22	IDN284	Mbeliling–Tanjung Kerita Mese*	Flores	32,894
23	IDN285	Sesok	Flores	6,436
24	IDN286	Nangalili	Flores	430
25	IDN287	Todo Repok	Flores	16,206
26	IDN288	Ruteng*	Flores	39,957
27	IDN289	Gapong	Flores	14,674
28	IDN290	Pota	Flores	708
29	IDN291	Nangarawa	Flores	10,666
30	IDN292	Gunung Inerie	Flores	11,503
31	IDN293	Aegela	Flores	4,019
32	IDN294	Wolo Tado	Flores	9,158
33	IDN296	Pulau Ontoloe	Flores	377
34	IDN297	Mausambi	Flores	3,478
35	IDN298	Kelimutu	Flores	6,245
36	IDN300	Tanjung Watu Mana	Flores	431
37	IDN303	Pulau Besar	Flores	5,321
38	IDN304	Egon Ilimedo	Flores	27,388
39	IDN305	Ili Wengot	Flores	4,061
40	IDN306	Gunung Lewotobi	Flores	9,725
41	IDN308	Larantuka	Flores	2,363
42	IDN309	Tanjung Watupayung	Flores	7,139
43	IDN312	Lamalera	Flores	5,861
44	IDN313	Lembata	Flores	30,467
45	IDN315	Pantar	Flores	14,134
46	IDN317	Gunung Muna	Flores	9,525
47	IDN319	Mainang	Flores	7,240
48	IDN321	Tuti Adagae	Flores	24,278
49	IDN322	Kunggwera	Flores	8,773

Note: * = Top-ranked KBA based on vulnerability and irreplaceability scores.

Figure 21. KBA clusters and marine corridors prioritized for CEPF funding



Note: Palung Timor marine corridor is not shown on this map.

13.2.3 Priority marine corridors

Chapter 5 identified 21 marine corridors. From these, Selat Makassar, Laut Sulawesi and Laut Sawu were excluded from further consideration because the conservation issues they face are primarily over-fishing by commercial vessels operating far from land, and the solutions (patrolling, enforcement, legislation, etc.) are outside the scope of CEPF grants to local CSOs. The remaining corridors were scored according to five criteria, which were weighted to give greater priority to biological importance and CSO capacity (Table 71).

Table 71: Scores and criteria for ranking marine corridors

Criteria	Low	Medium	High	Weight
Biological importance, based on the biological ranking of marine corridors presented in Section 5.2.3	1	2	3	x4
Funding need, based an assessment of funding available for community-based marine resource management	1	2	3	x2
Political support from local government and authorities	1	2	3	x2
CSO capacity to absorb funding and implement successful projects	1	2	3	x3
Adat, namely the presence of customary rules and practices for marine and coastal resources	1	2	3	x2

Table 72 and Figure 21 show the marine corridors scored and ranked against these criteria. The ecosystem profile updating team reviewed this ranking and made a final decision on the selection of priority corridors taking into account the information available and relevant factors, as explained below. The seven marine corridors with a total (weighted) score of 27 or more were prioritized for CEPF investment. These comprise five in the Sulawesi bioregion and one each in the Maluku and Lesser Sundas bioregions.

Togean-Banggai emerged as the highest priority, with outstanding biological importance, a high need for funding and strong political support, combined with moderate levels of CSO capacity, and adat customary resource management institutions and norms. The corridor was the site of several successful projects during previous phases of CEPF investment.

Solor-Alor emerged as the next highest priority, because of its exceptional biological importance, even though other criteria were assessed as medium. It is the only marine corridor in the Lesser Sundas bioregion to be included on the priority list. There is limited CSO capacity in the corridor, meaning that it is expected that CSOs from neighboring Flores will work there, as happened during previous CEPF phases.

Sulawesi Utara is a medium biological priority, with high political support and CSO capacity. This corridor was the location of many of the most successful projects in the first phase of CEPF investment. There are numerous opportunities for leveraging funding and impact in this corridor, for example through engaging with government, donors or the private sector.

Sulawesi Tenggara was a newly identified corridor during the second phase of CEPF investment. There is already significant marine conservation activity in Wakatobi National Park but less around Buton island and the mainland of Sulawesi.

Pangkajene Kepulauan was a newly identified corridor during the second phase. It includes the important Sabalana archipelago, and is a medium biological priority, with high

political support and high funding need. Threat levels may be lower here because of the remoteness of the corridor (15 hours by boat from Sumbawa). This also poses challenges of access for CSOs wishing to work there, and for supervision and delivering capacity building.

Bentang Laut Buru is an important corridor in its own right and the highest ranked marine corridor in the Maluku bioregion. It was a target for investment in previous CEPF investment phases, leading to innovative projects working with traditional leaders and customary resource management rules to establish sustainable coastal resource management.

Sulawesi Selatan was a newly identified corridor during the second phase. It encompasses the city of Makassar, and the Kapoposang, Selayar and Taka Bonarate island groups. Political support, CSO capacity and funding need are all high.

Table 72: Prioritization of marine corridors in Indonesia for CEPF investment

Name	Biological importance	Funding need	Political support	CSO capacity	Adat	Total (weighted)
Sulawesi Bioregion						
Sulawesi Utara	2	1	3	3	2	**29**
Barat Sulawesi Tengah	1	3	2	1	1	**19**
Togean–Banggai	3	3	3	2	2	**34**
Sulawesi Tenggara	2	1	3	2	3	**28**
Sulawesi Selatan	1	3	3	3	1	**27**
Pangkajene Kepulauan	2	3	3	2	1	**28**
Laut Sulawesi	Excluded from prioritization analysis					
Selat Makasar	Excluded from prioritization analysis					
Maluku Bioregion						
Halmahera	3	1	3	1	1	**25**
Kepulauan Sula	1	3	3	1	1	**21**
Bentang Laut Buru	1	2	2	3	3	**27**
Bentang Laut Lucipara	2	2	1	1	1	**19**
Bentang Laut Banda	2	2	2	1	1	**21**
Busur Banda Dalam	1	2	2	1	3	**21**
Busur Banda Luar	1	2	2	1	3	**21**
Lesser Sundas Bioregion						
Lombok-Sumbawa	1	2	3	2	2	**24**
Komodo-Selat Sumba	1	2	3	1	1	**19**
Solor–Alor	3	2	2	2	2	**30**
Laut Sawu	Excluded from prioritization analysis					
Timor-Leste Marine	Ranking to be determined based on funding availability					
Palung Timor	Ranking to be determined based on funding availability					

Note: Priority corridors for funding are shaded.

Away from the priority corridors, the seas surrounding Halmahera are particularly important, because of threats to marine life from land-based mining and mineral processing. The corridor has low CSO capacity and low levels of customary management of resources, making grant making challenging. Also, due to the nature of the threats, land-based conservation interventions, rather than direct interventions in marine ecosystems, are required. Halmahera has been selected as a priority terrestrial KBA cluster.

The seven priority marine corridors contain 46 KBAs, which were automatically considered priority sites. Tables 73-75 list the priority marine sites by bioregion. The priority marine sites cover a combined area of 5,818,575 ha, equivalent to 62 percent of the total area of marine KBAs in the hotspot.

Table 73: Priority marine sites in the Sulawesi Bioregion

No.	KBA code	KBA name	Marine corridor	Area (ha)
1	IDN001	Kepulauan Nanusa	Sulawesi Utara	33,527
2	IDN002	Perairan Karakelang Utara	Sulawesi Utara	32,439
3	IDN006	Perairan Talaud Selatan	Sulawesi Utara	47,326
4	IDN008	Kawaluso	Sulawesi Utara	341,700
5	IDN009	Perairan Sangihe	Sulawesi Utara	132,520
6	IDN013	Mahangetang	Sulawesi Utara	33,568
7	IDN014	Perairan Siau	Sulawesi Utara	76,939
8	IDN016	Perairan Tagulandang	Sulawesi Utara	21,805
9	IDN017	Perairan Biaro	Sulawesi Utara	16,894
10	IDN018	Perairan Likupang	Sulawesi Utara	55,339
11	IDN020	Molaswori	Sulawesi Utara	55,081
12	IDN023	Selat Lembeh	Sulawesi Utara	17,598
13	IDN026	Tulaun Lalumpe	Sulawesi Utara	1,272
14	IDN032	Perairan Arakan Wawontulap	Sulawesi Utara	14,810
15	IDN033	Amurang	Sulawesi Utara	24,168
16	IDN077	Perairan Kepulauan Togean	Togean– Banggai	335,087
17	IDN079	Perairan Pagimana	Togean– Banggai	1,079
18	IDN081	Perairan Peleng–Banggai	Togean–Banggai	504,117
19	IDN087	Perairan Balantak	Togean– Banggai	6,211
20	IDN105	Teluk Lasolo-Labengki	Sulawesi Tenggara	87,764
21	IDN107	Pulau Hari	Sulawesi Tenggara	43,410
22	IDN112	Pesisir Tinanggea	Sulawesi Tenggara	18,300
23	IDN113	Selat Tiworo	Sulawesi Tenggara	25,575
24	IDN117	Wabula	Sulawesi Tenggara	46,524
25	IDN119	Perairan Wakatobi	Sulawesi Tenggara	1,315,636
26	IDN121	Pulau Batu Atas	Sulawesi Tenggara	31,650
27	IDN122	Basilika	Sulawesi Tenggara	202,139
28	IDN125	Kepulauan Sagori	Sulawesi Tenggara	20,640
29	IDN132	Perairan Pallime	Sulawesi Selatan	34,762

No.	KBA code	KBA name	Marine corridor	Area (ha)
30	IDN136	Kapoposang-Pangkep-Bulurokeng	Sulawesi Selatan	366,929
31	IDN139	Kepulauan Selayar	Sulawesi Selatan	307,241
32	IDN141	Taka Bonerate	Sulawesi Selatan	559,323
33	IDN142	Perairan Tana Jampea	Sulawesi Selatan	555,217

Note: No KBAs have yet been identified within Pangkajene Kepulauan corridor.

Table 74: Priority marine sites in the Maluku bioregion

No.	KBA code	KBA name	Marine corridor	Area (ha)
1	IDN191	Liliali	Bentang Laut Buru	47,687
2	IDN197	Perairan Teluk Kayeli	Bentang Laut Buru	16,020
3	IDN198	Kelang-Kassa-Buano-Marsegu	Bentang Laut Buru	216,380
4	IDN206	Perairan Gunung Salahutu	Bentang Laut Buru	842
5	IDN208	Leihitu	Bentang Laut Buru	14,112
6	IDN209	Perairan Haruku Saparua	Bentang Laut Buru	48,332

Table 75: Priority marine sites in the Lesser Sundas bioregion

No.	KBA code	KBA name	Marine corridor	Area (ha)
1	IDN307	Pantai Selatan Lebau	Solor–Alor	1,692
2	IDN310	Flores Timur	Solor–Alor	3,034
3	IDN311	Perairan Lembata	Solor–Alor	37,278
4	IDN314	Selat Pantar	Solor–Alor	54,425
5	IDN316	Pantar Utara	Solor–Alor	3,281
6	IDN318	Perairan Gunung Muna	Solor–Alor	3,539
7	IDN320	Perairan Alor Utara	Solor–Alor	5,363

13.3 Strategic directions and investment priorities

While the priority geographies provide focus for *where* CEPF-funded work might take place, and the priority species provide focus for *what* might be conserved, the strategic directions and investment priorities describe *how* conservation might happen. Thus, summarizing from the two above sections, the initial focus of work is expected to be on three land-and-seascapes, which themselves contain six priority terrestrial KBA clusters (i.e., Lindu, Poso, Malili, Sulawesi Timur, Togean-Banggai and Seram) and two priority marine corridors (Togean-Banggai and Buru seascape). Over the course of five years, other priorities will then be addressed.

Table 76 presents the thematic priorities for the third phase of CEPF investment in Wallacea. This is a departure from the investment strategies for the previous phases, which had separate strategic directions for marine and terrestrial geographic priorities, and which created a distinction between conventional, government-managed protected areas and community-managed protected areas. This distinction only caused confusion for applicants, because such sites are often adjacent to one another and the status of community-managed areas can frequently change as they are absorbed into conventional protected areas.

Table 76: Strategic directions and investment priorities for CEPF investment

CEPF strategic directions	CEPF investment priorities
1. Address threats to priority species	1.1 Monitor exploitation and trade of priority species 1.2 Change societal behavior towards priority species through appropriate enforcement, education, incentives and alternatives 1.3 Mainstream the concepts of globally threatened species and biodiversity conservation into popular ethos and laws, policies and regulations
2. Improve management of priority sites with and without official protection status	2.1 Facilitate effective collaboration among CSOs, local and Indigenous communities and government agencies to improve planning and management of priority sites 2.2 Work with central and local governments on specific legal and policy instruments for better site management, and build a constituency of support for their promulgation and implementation
3. Support sustainable natural resource management by Indigenous people and local communities in priority geographies	3.1 Support community institutions to secure adequate rights over resources, and to develop and implement rules on resource use 3.2 Develop alternatives for livelihoods otherwise dependent on unsustainable resource management practices and enhance markets for sustainably produced products and services 3.3 Promote the use of existing policies for conservation, including on Indigenous rights and environmental safeguards 3.4 Facilitate links among communities, CSOs, cooperatives, business associations and the private sector to create economic incentives for changes in practice and behavior
4. Facilitate the development of a robust and resilient community of conservation civil society organizations	4.1 Ensure that CEPF grantees have the technical capacity to plan, implement and sustain effective conservation projects 4.2 Provide support to targeted conservation CSOs engaged in a process of organizational development 4.3 Enhance the collective strength and ability of conservation CSOs
5. Provide strategic leadership and effective coordination of conservation investment through a Regional Implementation Team	5.1 Support a broad constituency of civil society groups working across institutional and political boundaries towards achieving the shared conservation goals described in the ecosystem profile

The thematic priorities presented here, and the ensuing indicators and targets in Chapter 14, directly feed into the 13 strategies and 20 targets of the IBSAP, particularly in terms of integrating biodiversity into planning (Investment Priority 1.3), better management of protected areas (Strategic Direction 2), promoting sustainable resource use (Strategic Direction 3), strengthening governance and capacity (Strategic Direction 4), improving monitoring (Investment Priority 1.1), raising public awareness (Investment Priorities 1.2 and 2.2), leveraging traditional knowledge (Investment Priorities 3.1 and 3.3) and fostering multi-stakeholder collaboration (Investment Priorities 2.2 and 3.4).

Strategic Direction 1: Address threats to priority species

Projects with a focus on priority species (Tables 64 and 65) are eligible under this strategic direction. Priority is given to approaches that establish or sustain long-term conservation programs for core populations of priority species, and that address one or more of the following investment priorities.

Investment Priority 1.1: Monitor exploitation and trade of priority species
Targeted monitoring that can be communicated to community stakeholders (resource users) and government regulators is of immediate value and is the basis for conservation action. For species that are primarily threatened by over-consumption, a critical first step may be to establish a monitoring program, working with the hunters/harvesters/fishers who target the species. In the case of marine species, simple data on location and effort, size and catch volume gathered from one of two locations within a collection ground can provide vital information to advocate for change and inform sustainable management.

Communicating the results of any monitoring program is an important part of achieving impact. Communication of the results of monitoring of Banggai cardinalfish, for example, contributed to the decision by the Indonesian Government to list the species under CITES. Any monitoring work funded by CEPF will be expected to have a clear, targeted plan for communication of the results of the work, therefore.

Investment Priority 1.2: Change societal behavior towards priority species through appropriate enforcement, education, incentives and alternatives
Behavioral change is a product of availability of information, alternative technologies or skills, and removal of other constraints to change, often backed up by government regulations and, in some areas, customary rules and sanctions. CEPF will fund projects where there is evidence that changing the behavior of hunters/harvesters/fishers will improve the conservation status of a priority species, and where there is a clear opportunity to do so. An opportunity might be where a positive community practice can be strengthened through local regulations or, conversely, where implementation of local regulations requires hunters/harvesters/fishers to develop knowledge and/or skills.

Behavior of users and effectiveness of local protection efforts may be strongly influenced by market signals. For species that are legally protected, especially those under pressure from international trade and listed under CITES, scrutiny of legal trade and investigation of illegal trade can reduce demand and, thus, the incentive for unsustainable exploitation. CEPF will fund monitoring and investigation of the trade in threatened species where there is a clear opportunity for follow-up, such as a commitment from the relevant authorities to take action once they have the data.

Behavioral change also extends to communities at large, where there is demand for a product or acceptance of it as not impactful (e.g., bracelets made from turtle shells or capture of birds that are perceived as being locally plentiful). This requires social marketing techniques, to change knowledge, attitudes and, ultimately, behavior.

This Strategic Direction is expected to support grants that influence the behavior of communities by encouraging positive changes, as opposed to penalizing negative behavior. In general, grants will focus on people and behavior, as opposed to interdiction in illegal trade.

As far as possible, grants will support experience exchange within Indonesia or elsewhere in Asia. There are particular opportunities to learn from programs like the EU-funded GUARD Wildlife – Demand Reduction Alliance, which are working to shape consumer attitudes. Some of the implementers of that program, such as WCS and WWF, have a presence in Indonesia. Grants to local CSOs could support engagement with groups such as these.

Investment Priority 1.3: Mainstream the concepts of globally threatened species and biodiversity conservation into popular ethos and laws, policies and regulations
Building broad-based support for biodiversity conservation in Wallacea requires promotion of the concept of biodiversity as the foundation of life. Healthier ecosystems lead to better livelihoods for the communities that rely on the goods and services they provide. CEPF will support projects that mainstream biodiversity conservation into laws, policies and regulations, noting that, often, they might not be directly about the environment.

Strategic Direction 2: Improve management of priority sites with and without official protection status

Projects that aim to improve management of priority sites (Tables 68-70 and 73-75) are eligible under this strategic direction, regardless of their management status. CEPF will support improved management of existing and proposed protected areas, whether formal or informal, government-managed or community-managed, as well as conservation actions in production landscapes, addressed through Other Effective Area-based Conservation Measures (OECMs). There are many OECM designations, including community forests, community fisheries, preserved areas (*Area Preservasi*) and High Biodiversity Value Areas (*Kawasan Bernilai Keanekaragaman Hayati Tinggi*).

Projects must address one or both of the investment priorities below. Understanding both of those, it is understood that this Strategic Direction will include projects about awareness of KBAs and the use of natural resources within them. Thus, projects will go on to address licit or illicit behavior around those resources (e.g., seasonal fishing limits, rights to collect non-timber forest products, timber harvesting), taking advantage of best practice in the field, such as the capability, opportunity, and motivation (COM-B) framework to promote behavior change.

Investment Priority 2.1: Facilitate effective collaboration among CSOs, local and Indigenous communities and government agencies to improve planning and management of priority sites
An important need and opportunity exist to support the designated management agencies for priority sites to work with CSOs, local and Indigenous communities, and relevant government agencies to improve planning and management. This includes participatory approaches to establishing conventional protected areas and OECMs, as well as collaborative approaches to management planning and active engagement of communities in patrolling and monitoring. There exists a range of successful models for collaborative management, which could be replicated more widely. This investment priority is not limited to protected areas but extends to priority sites in production landscapes, such as fishing grounds, controlled harvesting areas, forestry estates, mining concessions or similar.

Investment Priority 2.2: Work with central and local governments on specific legal and policy instruments for better site management, and build a constituency of support for their promulgation and implementation
For marine sites, integration of MPAs into regional and national spatial and development plans, including the marine spatial plan (RZWP3K) that local governments must produce, is a key strategy to reduce threats (e.g., from infrastructure development) and to secure funding and personnel for site management. Analogous examples exist for terrestrial sites. CEPF will fund projects that work with local governments to ensure that priority sites are integrated into relevant plans and policies developed by central and local government.

Strategic Direction 3: Support sustainable natural resource management by Indigenous people and local communities in priority geographies

This strategic direction is focused on economic incentives for conservation of priority geographies, working through mechanisms focused on livelihoods and local zoning plans. Alternative and enhanced livelihoods can be a basis for sustainable management of natural resources. Small-scale fisheries, natural-resource-based industries and sustainable agriculture are all critical. Markets play an important role in driving both positive and negative actions by resource users. There are a number of models where criteria established by buyers have encouraged a switch towards more sustainable practices in local fisheries, for example. To be eligible under this strategic direction, projects must ensure equitable access to benefits for women, Indigenous people and other disadvantaged groups that live or use natural resources within priority KBA clusters (Table 67) and/or priority marine corridors (Table 72). Many of these grants will take place in production landscapes: areas of land and sea that are not formally protected but that may be designated as OECMs under various categories.

Investment Priority 3.1: Support community institutions to secure adequate rights over resources, and to develop and implement rules on resource use
Securing recognition of the rights of Indigenous people and local communities is a critical issue for sustainable natural resource management, which is making some progress in Wallacea. For example, at the time of the 2014 ecosystem profile, securing recognition for Indigenous marine tenure was considered legally difficult but this has now changed and there are opportunities for Indigenous groups to claim management rights over their coastal resources. The MMAF has established a directorate specifically to identify and support Indigenous marine and coastal resource management. While the directorate has only worked in a limited number of pilot sites to date, this represents a pathway to recognition for Indigenous coastal communities which could be used with the support of CEPF grantees. Similar opportunities exist to support Indigenous people and local communities to secure legal recognition of their rights to use and manage terrestrial and freshwater resources.

Investment Priority 3.2: Develop alternatives for livelihoods otherwise dependent on unsustainable resource management practices and enhance markets for sustainably produced products and services
In the first two phases of CEPF investment, several projects were successful at developing alternative livelihoods sources, to enable community members to move away from dependence on unsustainable exploitation of natural resources. CEPF will continue to support these kinds of interventions where the target group is clearly identified, the conservation benefits are clear, and the viability and sustainability of the alternative livelihoods can be demonstrated.

Investment Priority 3.3: Promote the use of existing policies for conservation, including on Indigenous rights and environmental safeguards

Planning and implementation of the sustainable management of natural resources depends, in part, on the ability and right of a community to exclude outsiders who exploit resources without sharing the burden of management. Experience from prior phases of investment showed that, while many communities successfully reached internal agreement on resource management rules, exclusion of outsiders required the support of local government regulation and agencies. This support can be secured through a specific local regulation, or integration of community managed areas into official zonation plans (primarily RZWP3Ks in the case of marine corridors). To be eligible under this investment priority, projects must present a strategy for securing such support from local government.

Investment Priority 3.4: Facilitate links among communities, CSOs, cooperatives, business associations and the private sector to create economic incentives for changes in practice and behavior

Where agricultural or fisheries production is commercialized, the private sector has an important role to play in setting standards for the commodities it trades in. Work by other organizations in Wallacea (MDPI, Sustainable Fisheries Partnership, etc.) has demonstrated that producers (farmers, fishers, NTFP collectors, etc.) can receive premium prices for sustainably produced products when these are linked to the right markets. CEPF will support projects that aim to connect producers of sustainable, wildlife-friendly products with markets for these products, including by building the skills and institutional capacity of producers to enable them to participate in certification schemes and value chains for sustainable products. This investment priority covers both marine products and agricultural products, such as certified sustainably produced coffee, cacao, fruits and spices, provided that there are demonstrated criteria to protect and/or restore biodiversity.

Strategic Direction 4: Facilitate the development of a robust and resilient community of conservation civil society organizations

This strategic direction reflects a commitment by CEPF to engage more deeply in the issue of long-term sustainability of CSOs in the Wallacea Hotspot. Investment Priority 4.1 addresses the need to ensure that all CEPF grantees have access to support for the design, management, evaluation and reporting of the projects they implement with CEPF support. Joint and peer-to-peer learning will be important in delivering this. Investment Priority 4.2 delivers on CEPF's commitment to invest in the organizational development of a smaller group of strategic partners with high potential to deliver transformative impacts. Investment Priority 4.3 focuses on the strengthening of networks and collaborative action.

The details of calls for proposals, and the selection of projects, under this strategic direction will be informed by CEPF's global strategy on organizational development, which was adopted in August 2025. The organizational development strategy balances structure with flexibility, providing a guiding framework that allows for tailored support to CSOs, communities of CSOs (including networks) and RITs. The strategy is comprehensive but flexible. It provides tools and guidelines, yet allows scope for CSO assessment and determination, recognizing that organizational development cannot be imposed from outside. Rather, CSOs must recognize the need to grow and be willing to make the necessary changes.

Funding for all types of capacity building and organizational development may be awarded: to a specialist service provider, to support one or several beneficiary CSOs; directly to the beneficiary CSO as part of a larger conservation project grant; or directly to the beneficiary CSO as a dedicated capacity development grant. The decision on the most appropriate approach in a given case will be influenced by the capacity development approach being supported, as summarized in Table 77. The RIT will have a key role in planning and coordinating the efficient and effective delivery of capacity building and organizational development, using the range of capacity development approaches and funding modalities available. The RIT is expected to involve dedicated CSO capacity development organizations to assist them in this role, as well as in the design and delivery of appropriate support that addresses needs identified by CSOs.

Table 77: Capacity development approaches and examples of grantmaking modalities to support them

Type of approach	Possible grant-making modality
Capacity development on shared priority topics and for peer-to-peer learning (Investment Priority 4.1)	Grant to a specialist service provider to organize events for multiple grantees
Training and mentoring for individual CSOs on specific skills (Investment Priority 4.1)	Integration of support for capacity building as a component of a larger grant for a conservation project
Assessment, planning and delivery of a program of organizational development for a strategic CSO partner (Investment Priority 4.2)	Grant to a CSO specifically for organizational development ***OR*** Grant to a specialist service provider to support the organizational development of one or more beneficiary CSOs
Support to a group of CSOs to form or strengthen a network or coalition (Investment Priority 4.3)	Grant to one or more CSOs to establish a new network/coalition or strengthen an existing one

Investment Priority 4.1: Ensure that CEPF grantees have the technical capacity to plan, implement and sustain effective conservation projects

Many of the local CSOs currently working or with the potential to work on biodiversity conservation in Wallacea have missions focused on community development (as opposed to conservation *per se*), and need training in technical issues to plan, implement and sustain conservation projects more effectively (see Section 3.9). CEPF will consider provision of core project planning and management capacity development to any local CSO that receives funding to implement a conservation project. This may include capacity building for participatory development, sustainable, climate-resilient livelihoods, and linking livelihood interventions to conservation outcomes. Needs will be identified jointly by the RIT and each grantee, either at the start of each project or during its implementation. Skills training will be delivered primarily through standardized modules, provided online or in person. Where a partner CSO needs specific, one-to-one support in particular capacity areas, this may be addressed by the RIT directly, by a specialist training provider, or by arranging for the CSO to partner with a more experienced mentor (such as an international NGO): an approach that was used successfully during the previous investment period.

Activities eligible for funding under this investment priority include:

- Developing and running a training course (in-person or online) to address priority training needs identified by grantees, or participation in a course.
- Participation in a skills training course being organized by a specialist provider.
- Mentoring or coaching individual staff.
- Providing advice to management staff on capacity building.
- Learning visits and exchanges to other organizations and projects.
- Mentoring and support for writing up and publishing the results and lessons from projects.
- Procuring equipment and material that allow new skills to be implemented.

Investment Priority 4.2: Provide support to targeted conservation CSOs engaged in a process of organizational development

CEPF intends to invest in longer-term and deeper support for the organizational development of a small number of strategically important CSOs in the region (indicatively, this might be up to 10 organizations). This support will go beyond project-related capacity building (Investment Priority 4.1), to cover such issues as strategic communications, financial sustainability, governance, management of staff turnover and regeneration. By fostering an adaptive, learning-driven approach, support for organizational development will ensure that CSOs and their networks increase their resilience to a changing operating environment and their ability to protect biodiversity for generations to come.

Long-term support for organizational development will be prioritized for partners with:

- A track record of successful implementation of conservation projects (regardless of size of project or donor).
- Basic systems for the development and management of the organization's activities in place (e.g., staffing structure, finance and accountability mechanisms, governance).
- Clear evidence of a commitment to organizational change, including a willingness and ability to allocate staff time and resources.
- A plan for sustaining organizational development, including institutionalization of changes to working culture and jobs, continuation of financial support, and ongoing contact and access to support where needed.

Examples of activities eligible for funding under this investment priority could include:

- Preparatory discussions between key people in the organization and an expert facilitator, to help the organization understand and plan an organizational development process.
- A workshop or retreat to plan a process of organizational development, including, for example, completing a diagnostic tool.
- An external facilitator to facilitate the workshop and support the planning process.
- Facilitation and organization of an initial, high-priority organizational development activity (e.g., a strategic planning workshop).
- Delivery of an organizational development plan over 2-3 years, including retreats, workshops and mentoring visits.
- Learning visits to other CSOs.
- Participation in peer-learning events and exchanges.

- Proposal development to raise funds for continuing organizational development and follow-up activities.

Investment Priority 4.3: Enhance the collective strength and ability of conservation CSOs

CEPF recognizes that CSOs have tended to work alone or in sectoral silos, and that this limits the potential for creating change, especially at the level of policy or wider society. It also recognizes, however, that inducing CSOs to work together only to access funding does not create impactful, collaborative partnerships and networks. Indeed, funding can create inequalities of power, which can harm the collaborative nature of a network.

CEPF will prioritize funding for new or existing collaborative efforts and networks where:

- There is a clear purpose and clear constituency (target audience). Examples might include collaboration to conserve a specific site, address a particular problem, influence a specific policy, or change the public narrative on an issue.
- There is a clear mechanism for managing support received from CEPF or other sources, including mechanisms for receiving and handling funds, planning, reporting and accountability within the network.
- There is evidence of the willingness and commitment of CSOs to work together beyond the desire to collaborate to secure funding (e.g., self-funded collaboration, which can be scaled up or sustained with CEPF support).

Actual or perceived competition among CSOs has been identified as a barrier to collaboration (although it may also drive innovation and improvement). CEPF support to networking and collaboration should contribute to demonstrating the value of open collaboration, and the sharing of ideas and resources. CEPF support will, therefore, focus on networks and collaborative efforts that are open, and actively encourage the engagement of wider civil society. This will include providing opportunities for less experienced individuals and organizations to learn and grow through their participation.

Activities eligible for funding under this investment priority include:

- Workshops and meetings to initiate or strengthen collaboration among CSOs working on a common conservation issue.
- Networking meetings, communications and joint actions.

Strategic Direction 5: Provide strategic leadership and effective coordination of conservation investment through a Regional Implementation Team

CEPF will implement its grant program through a Regional Implementation Team (RIT). The RIT will promote and administer the grantmaking process, undertake key capacity-building, maintain and update data on conservation outcomes, and promote the overall conservation outcomes agenda to government and other stakeholders.

Investment Priority 5.1: Support a broad constituency of civil society groups working across institutional and political boundaries towards achieving the shared conservation goals described in the ecosystem profile

The RIT will provide strategic leadership and local knowledge to build a broad constituency of civil society groups working across institutional and political boundaries towards achieving

the conservation goals described in the ecosystem profile. It will implement several functions, as set out in the terms of reference, including:

- Act as an extension service to assist civil society groups in designing, implementing and replicating successful conservation activities.
- Review all grant applications and manage external reviews with technical experts and advisory committees.
- Award small grants of up to US$50,000 and decide jointly with the CEPF Secretariat on all other applications.
- Lead the monitoring and evaluation of individual projects using standard tools, site visits and meetings with grantees, and assist the CEPF Secretariat in portfolio-level monitoring and evaluation.
- Build the institutional capacity of grantees to ensure efficient and effective project implementation.
- Widely communicate CEPF objectives, opportunities to apply for grants, lessons learned and results.

The RIT will directly support strategic development of the grant portfolio and contribute, in its own right, to the achievement of critical conservation results that yield portfolio-wide benefits. Such activities may include facilitating learning exchanges among grantees and other stakeholders, identifying leveraging opportunities at the grant or portfolio level or collaborating with other donors to align support to CSOs and their conservation projects.

The RIT will promote the grant and organizational development opportunities presented by the CEPF program to civil society, through announcements tailored to specific issues and geographies. While CEPF is relatively well known in the hotspot, following a decade of investment, there remains a need to ensure that local CSOs, especially groups representing women, Indigenous people and other disadvantaged groups are not prevented from accessing support by barriers, such as language or lack of information on the process.

In Phase I and Phase II, the RIT was particularly effective at reaching smaller organizations or groups that had not previously accessed funds from international donors, due to their often complex requirements. The RIT was advantaged by having offices and a physical presence at various points: in Makassar, Gorantalo and Banggai (all in Sulawesi); in Halmahera and Ambon (in the Maluku islands), and in Larantuka and Waingapu (in the Lesser Sundas). The RIT routinely held applicant outreach workshops prior to the release of calls for proposals, to sensitize potential applicants to the goals of CEPF.

In Phase III, the RIT will balance its ability to reach even the smallest of organizations with knowledge of the limits of what those organizations can manage. Judgment will be necessary to ensure that projects are achieving short-term impacts in terms of biodiversity, human well-being and organizational development results, while allowing for the capacity of the recipients and the managerial limits of the RIT and the CEPF Secretariat.

Beyond making CSOs aware of the existence of the CEPF program and supporting them to access grants and other forms of support, the RIT will connect CSOs together in networks and alliances, based on common thematic interests or geography. This networking will extend beyond the boundaries of the hotspot, to facilitate connections with the wider conservation community in Indonesia and the Southeast Asia region.

In line with the overall CEPF investment niche, capacity building and organizational development will be at the core of the RIT's role, as per Strategic Direction 4. The RIT, together with the CEPF Secretariat, will be responsible for ensuring that grantees have the institutional and individual capacity needed to design and implement conservation projects that contribute to the overall investment strategy. The RIT will also have a role in communicating about CEPF's focus on organizational development, publicizing the opportunity and supporting CEPF to identify organizations to receive support with organizational development. Experience has shown that capacity building is essential to ensuring good projects that are integrated into a wider hotspot strategy and a common conservation vision. The added emphasis on organizational development aims to increase the resilience and sustainability of CEPF's investment at all levels.

The RIT will work with the Secretariat to monitor grant awards and project results in relation to the geographic and thematic priorities. This will include ensuring that the balance of opportunities presented via calls for proposals and grant awards made reflects the interests of the donors, civil society and government partners.

The RIT and the CEPF Secretariat will also work together to keep up to date information on threats, the operating environment for CSOs and the conservation investment landscape. In particular, this includes monitoring gaps in funding for biodiversity conservation in the budgets of local and district government agencies and the regional offices of national environmental ministries. This will inform changes to the investment strategy, which can take place during the investment phase, especially during the mid-term assessment. Throughout the investment phase, the RIT and the CEPF Secretariat will collaborate to monitor the impacts of individual projects and the portfolio as a whole. The RIT will use this data to inform the relevant provincial and national agencies about the progress of and lessons from the program.

In Phase III, the RIT will further continue the approach it used from 2014-2024, premised on close alignment with national government agencies. The RIT's location in Bogor, easily accessible to the national capital in Jakara, has allowed it to maintain relationships with the Ministry of Forestry and Environment, the Ministry of Marine Affairs and Fisheries, BAPPENAS, BPDLH and others. The RIT ensures alignment of the CEPF grant portfolio with government plans via: coordination with government partners on the focus of requests for proposals; local endorsement of project proposals; and review of project results.

14. RESULTS FRAMEWORK

The result framework primarily uses CEPF Global Indicators (GI) to set targets for the investment in the hotspot. Additional Portfolio Indicators (PI) are introduced to set targets and monitor specific impacts that are not covered by the global indicators.

The objective for the grant portfolio is to support 45 unique Indonesian civil society organizations, via approximately 60 large and small grants, over a five-year investment period. This is based on an assumed $8 million investment with an initial focus on a subset of the priority geographies plus cross-cutting investments in species conservation (Strategic Direction 1) and organizational development (Strategic Direction 4).

Using these expected resources, the anticipated results shown below are based on CEPF experience in the hotspot during Phase I and Phase II, plus CEPF experience elsewhere around the world. Targets are purposefully conservative, recognizing that: (i) the organizations that implement projects may have low capacity; and (ii) CEPF wishes to maintain a high standard for validating results as having been achieved. Various scorecards, objective monitoring and evaluation methods, as well as other options, will be considered appropriate to the circumstances of the grantee and location.

The anticipated results are divided into terrestrial/freshwater and marine realms to reflect differences in the work, particularly for biophysical indicators.

Pillar 1: Biodiversity

Goal: Improve the status of globally significant biodiversity in critical ecosystems within hotspots.

No.	Indicator	Target – Terrestrial/ freshwater	Target - Marine	Relevant SDs/IPs	Means of verification
GI-B1	Number of globally threatened species benefiting from conservation action	10	5	1.1	Grantee reports
GI-B2	Number of hectares of Key Biodiversity Areas with improved management	250,000	50,000	2.1	Grantee reports
GI-B3	Number of hectares of protected areas created and/or expanded	0	15,000	2.2	Grantee reports, Official documents
GI-B4	Number of hectares of production landscapes with strengthened management of biodiversity	95,000	5,000	3.1	Grantee reports
GI-B5	Number of protected areas with improved management	3	6	2	Protected Area Management Effectiveness Tracking Tool (or similar tool)

GI-B6	Number of hectares of terrestrial forest, terrestrial non-forest, freshwater and coastal marine areas brought under restoration	-	-	-	Grantee reports
PI-B1	Number of communities with change in behavior intended to result in a reduction in illegal wildlife trade and/or other threats to globally threatened species	37	10	1	Grantee reports
PI-B2	Number of hectares of protected areas with improved management	5,000	5,000	2	Grantee reports

Notes: Regarding indicator GI-B3, the Ministry of Forestry has no plans to expand the coverage of formally protected terrestrial areas. The focus will be on other effective conservation measures (OECM), with such areas to be designated as *Area Preservasi (AP)* or *Kawasan Bernilai Keanekaragaman Hayati Tinggi (KBKT).* Regarding indicator GI-B5, anticipated terrestrial focus on Lore Lindu, Manusela and Aketajawe Lolobata; anticipated marine focus on Liukang Tupakbiring, Perairan Lembata, Perairan Flores Timur, Periarian Lembeh, TPK Buano and Alor. Regarding indicator PI-B2, the targets anticipate only counting the hectares in each protected area where there is direct influence, and not the entire protected area. Regarding indicator GI-B6, there is no anticipated focus on this and hence, no target; if restoration takes place, it will nevertheless be monitored.

Pillar 2: Civil Society

Goal: Strengthen the capacity of civil society to be effective as environmental stewards and advocates for the conservation of globally significant biodiversity.

No.	Indicator	Target – Terrestrial/ freshwater	Target - Marine	Relevant SDs/IPs	Means of verification
GI-CS1	Number of CEPF grantees with improved organizational capacity	20	10	4.1	CEPF Civil Society Tracking Tool
GI-CS2	Number of CEPF grantees with improved understanding of and commitment to gender issues	20	10	4.1	CEPF Gender Tracking Tool
GI-CS3	Number of networks and partnerships that have been created and/or strengthened	10	5	4.3	Grantee reports
PI-CS1	Number of CSOs that receive technical support for work in areas related to direct conservation action	10	5	4.2	CEPF report
PI-CS2	Number of CSOs that receive technical support for work in areas other than direct conservation action	10	5	4.2	CEPF report
PI-CS3	Number of organizations engaged in a process of organizational development	10	5	4.2	CEPF report
PI-CS4	Number of CEPF grantees that have made significant progress towards their own organizational development goals	6	4	4.2	Specific survey at mid-term and at the end of the investment phase

Note: Regarding indicator PI-CS2, this includes abilities in financial management, fundraising, collaboration, mainstreaming, and advocacy, all in relation to biodiversity conservation, as well as in other disciplines, such as enterprise promotion.

Pillar 3: Human Well-Being

Goal: Improve the well-being of people living in and dependent on critical ecosystems within hotspots.

No.	Indicator	Target – Terrestrial/ freshwater	Target - Marine	Relevant SDs/IPs	Means of verification
GI-HW1	Number of people receiving structured training	5,000 women 5,000 men	2,500 women 2,500 men	3	Grantee reports
GI-HW2	Number of people receiving non-cash benefits* other than structured training	50,000 women 50,000 men	15,000 women 15,000 men	3	Grantee reports
GI-HW3	Number of people receiving cash benefits**	5,000 women 5,000 men	2,500 women 2,500 men	3.3	Grantee reports
GI-HW4	Number of projects promoting nature-based solutions to combat climate change	20	5	5.1	CEPF Secretariat analysis of portfolio
GI-HW5	Amount of CO_2e sequestered in CEPF-supported natural habitats	-	-	-	CEPF Secretariat contract
PI-HW1	Number of community institutions*** with secured rights over resources	12	9	3.2	Grantee reports
PI-HW2	Number of sites where legislation/policy for conservation, Indigenous rights and/or environmental and social safeguards is explained and implemented to benefit communities	5	5	3	Grantee reports
PI-HW3	Number of jobs created	300	100	3	Grantee reports

Notes: * = non-cash benefits include increased access to clean water, increased food security, increased access to energy, increased access to public services, increased resilience to climate change, improved land tenure, improved recognition of traditional knowledge, improved representation and decision-making in governance forums, and improved delivery of ecosystem services; ** = cash benefits include increased income from employment, increased income from livelihood activities. Regarding indicator GI-HW5, there is no explicit focus on this, hence no target; this indicator will be monitored separately at the hotspot or global level. *** = community institutions include *inter alia* resource-user associations, councils of elders, traditional councils, community natural resource watch groups, neighborhood councils, religious groups and school groups.

Pillar 4: Enabling conditions for conservation

Goal: Establish the conditions needed for the conservation of globally significant biodiversity.

No.	Indicator	Target – Terrestrial/ freshwater	Target - Marine	Relevant SDs/IPs	Means of verification
GI-EC1	Number of laws, regulations, and policies with conservation provisions that have been enacted or amended	12	9	1.3, 2	Grantee reports, official documents
GI-EC2	Number of sustainable financing mechanisms that are delivering funds for conservation	-	-	-	Grantee reports; RIT analysis
GI-EC3	Number of companies that adopt biodiversity-friendly practices	1	1	1.3	Grantee reports
PI-EC1	Number of partnerships and/or initiatives that use economic incentives for change in practice and behavior	6	3	3	Grantee reports
PI-EC2	Amount of new funding attracted from international donors by the RIT	US$1 million	-	5	RIT reports

Notes: Regarding indicator PI-EC1, this includes business permits, non-timber forest product collection permits and ecotourism permits. Regarding indicator GI-EC2, there is no explicit focus on this, hence no target; if any sustainable financing mechanisms are established, they will nevertheless be recorded.

15. SUSTAINABILITY

As noted in the 2014 ecosystem profile, sustainability of the impact of CEPF program in Wallacea will depend, on the extent to which:

- The capacity of institutions and networks improves.
- Resources are mobilized and directed toward sustainable, rather than destructive, activities.
- Models of better ways of doing things are developed and adopted as formal policies and regulations or informal norms.
- Consideration of this profile by governments, donors, and other partners.

15.1 Capacity building for sustainability

Increased capacity among local and Indigenous communities managing natural resources and the CSOs that support them is a prerequisite for sustained impact post-CEPF intervention.

Chapter 3 on lessons learned summarized the impacts of projects on communities. There is considerable evidence of strengthening of individual and institutional capacity as a direct result of the projects funded, including the formation of new groups, successful engagement with local authorities, and increasingly effective protection and management of target sites. The revised investment strategy emphasizes the need to continue and expand this model of conservation action through building local capacity and supporting organizational development, especially among the most impactful CSOs.

Prior chapters summarized the process and impacts of the capacity development program for grantees, which was rolled out in parallel with grant-making in priority geographies during previous phases of the program. The program responded to needs identified during the preparation of the original ecosystem profile and its update. Self-assessment of capacity at the end of the process found evidence of progress with regard to both technical capacity and organizational development, although impacts varied widely among grantees, as would be expected with such a diverse range of organizations. The third phase of investment will continue this approach, adapted to take account of the fact that some corridors have already been targets for CEPF funding, while others are new. Future investment will also have a stronger focus on entrepreneurship and innovative ways of raising funds, recognizing that donor funding for CSOs' work is not guaranteed to be available at the current level over the long term.

In the third phase, greater and more deliberate emphasis will be placed on organizational development, guided by CEPF's global strategy on organizational development, adopted in August 2025. An explicit emphasis on organizational development will contribute to long-term sustainability of CSOs when it translates into effective organizations successfully raising funds and implementing projects independently of CEPF support. While some grantees have reported an increased diversity of funding sources, it is too soon to measure the long-term impact.

15.2 Sustainable financing

CSOs themselves may never be in a position to guarantee long-term financing for specific conservation measures. Achieving sustainable financial support for priority species and geographies, therefore, involves influencing budgeting and spending decisions made by

others. Villages throughout Wallacea have increasing autonomy and budgetary authority. As noted previously, in several communities, activities initiated by CSOs with CEPF support were adopted and financed through the village budget. In a few cases, villages succeeded in securing funds from district governments to support their activities. These models of achieving local financial sustainability need to be reinforced and replicated going forward.

Changes in policy now allow greater community participation in the management of Indonesian National Parks under both relevant ministries, and this provides another opportunity to indirectly influence how government resources are used for conservation.

15.3 Sustaining change through norms and regulations

The original ecosystem profile noted that decision-making for sustainable management of resources should be institutionalized at the lowest possible level to give the greatest chance of local ownership and sustainability. The projects funded in Phase I had considerable success in using existing social norms, including *sasi* and similar customary practices, as a basis for community action on resource management. The local ownership this provides strengthens the prospect of sustained impact, but it cannot be taken for granted-local custom is by its nature flexible and adaptable to changing circumstances. In most cases a combination of local norms, local (village or district) regulation and support within the framework of higher-level legislation gives the best chance of long-term impact.

15.4 The ecosystem profile as a public good

This ecosystem profile, like all CEPF profiles, defines conservation outcomes (i.e., globally threatened species, KBAs and conservation corridors), a methodology for achieving those (i.e., working via civil society), and a thematic approach for doing so. CEPF presents analyses of priority species and geographies as a public good. The money allocated by CEPF for granting in Wallacea will not be sufficient to address the conservation of all of them. However, the ecosystem profile can be used to influence and encourage other donors and government partners to address these priorities themselves. To this end, CEPF will maintain this strategy on its website and the RIT will promote its use in Wallacea.

REFERENCES

Arini, D. I. D., Christita, M., Mayasari, A., Suryaningsih, R., and Simamora, A. T. A. J. (2020). A review of anoa conservation efforts in Sulawesi, Indonesia. *IOP Conference Series: Earth and Environmental Science* 533(1): 012003.

BPS (2020) Badan Pusat Statistik [Central Bureau of Statistics] (bps.go.id) Accessed on 15 July 2021.

Cahyaningsih, R., Magos Brehm, J., and Maxted, N. (2021). Setting the priority medicinal plants for conservation in Indonesia. *Genetic Resources and Crop Evolution* 68(5), 2019-2050.

Carlile, J. C, Digdowirogo, S. and Darius, K. (1990) Geological setting, characteristics and regional exploration for gold in the volcanic arcs of North Sulawesi, Indonesia. *Journal of Geochemical Exploration* 35: 105-140.

CAVR (2005) Chega! The Report of the Commission for Reception, Truth and Reconciliation in Timor-Leste. http://www.etan.org/etanpdf/2006/CAVR/11-Recommendations.pdf

Chain Reaction Research (2021) Indonesian moratoria: loopholes, lack of sanctions fail to stop palm oil-linked deforestation. https://chainreactionresearch.com/report/indonesian-moratoria-palm-oil-deforestation/ Accessed on 19 August 2025.

Climate Action Tracker (2025) Climate action tracker: Indonesia. https://climateactiontracker.org/countries/indonesia/ Accessed on 19 August 2025.

Coates, B. and Bishop, K. D. (1997) *A guide to the birds of Wallacea.* Brisbane: Dove Publications.

Condro, A. A., Prasetyo, L. B., Rushayati, S. B., Santikayasa, I. P. and Iskandar, E. (2021). Predicting hotspots and prioritizing protected areas for endangered primate species in Indonesia under changing climate. *Biology* 10(2): 154.

Daily Insights (2021) Awaiting US$60 billion foreign capital inflow. Awaiting US$60 Billion Foreign Capital Inflow | D-Insights (katadata.co.id) Accessed on 14 July 2021.

Dow, R. A. (2019) *Oligoaeschna venatrix*. The IUCN Red List of Threatened Species 2019: e.T139070165A139118513.

ESDM (2023) *OneMap Indonesia*. https://geoportal.esdm.go.id/minerba/ Accessed in 2023.

Fagotto, M. (2014) Death metal: the island that's paying the price for your tablet. https://www.wired.com/story/death-metal/ Accessed on 14 August 2025.

Findlay, H. S. and C. Turley (2021) Ocean Acidifcation and Climate Change. Chap. 13 in *Climate Change: Observed Impacts on Planet Earth*, pp. 251-279. Elsevier. https://doi.org/10.1016/B978-0-12-821575-3.00013-X

Flannery, T. (1995) *Mammals of the south-west Pacific and Moluccan islands.* Ithaca: Cornell University Press.

FONGTIL (2025) The Timor Leste NGO Forum. https://fongtil.org.tl/ong-lokal-ong-nasional/ Accessed on 28 August 2025.

FSC (2025) FSC Search https://search.fsc.org/en/ Accessed on 20 August 2025.

Gillespie, G. R., Howard, S., Stroud, J. T., Ul-Hassanah, A., Campling, M., Lardner, B. and Kusrini, M. (2015) Responses of tropical forest herpetofauna to moderate anthropogenic disturbance and effects of natural habitat variation in Sulawesi, Indonesia. *Biological Conservation* 192: 161-173.

Hadiaty, R. K. (2018). Taxonomical status of endemic freshwater ichthyofauna of Sulawesi. *Jurnal Iktiologi Indonesia* 18(2): 175-190.

Handika, H., Achmadi, A. S., Esselstyn, J. A. and Rowe, K. C. (2021). Molecular and morphological systematics of the Bunomys division (Rodentia: Muridae), an endemic radiation on Sulawesi. *Zoologica Scripta* 50(2): 141-154.

Herjayanto, M., Gani, A., Adel, Y. S. and Suhendra, N. (2019). Freshwater fish of lakes and inlet rivers in Sulawesi Tengah province, Indonesia. *Journal of Aquatropica Asia* 4(1): 1-9.

HoganLovells (2020) Indonesian mining bill passed into law, poses new challenges and opportunities. https://www.hoganlovells.com/-/media/hogan-lovells/pdf/2020-pdfs/2020_06_24_ierp_alert_indonesian_mining_bill_passed_into_law_poses_new_challenges_and_opportunities.pdf Accessed on 15 July 2021.

Hunowu, I., Patandung, A., Pusparini, W., Danismend, I., Cahyana, A., Abdullah, S. and Linkie, M. (2020). New insights into Sulawesi's apex predator: the Sulawesi civet *Macrogalidia musschenbroekii*. *Oryx* 54(6): 878-881.

Ilmi, M. Z., Omar, S. B. A., Rahim, S. W., Yanuarita, D., Umar, M. T. and Hidayani, A. A. (2021). Distribusi Ukuran dan Tipe Pertumbuhan Ikan Endemik (Dermogenys orientalis Weber, 1894) di Perairan Sungai Bantimurung, Kawasan Karst Maros. *Prosiding Simposium Nasional Kelautan dan Perikanan* 8.

Indonesia Miner (2024) Gorontalo opens largest gold mine. https://indonesiaminer.com/news/detail/2025-01-08143131-gorontalo-opens-largest-gold-mine Accessed on 5 August 2025.

IPBES (2018) *The IPBES assessment report on land degradation and restoration*. Montanarella, L., Scholes, R., and Brainich, A. (eds.). Bonn: Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.

IUCN (2016) *A Global Standard for the Identification of Key Biodiversity Areas, Version 1.0.* Gland: IUCN. https://portals.iucn.org/union/sites/union/files/doc/a_global_standard_for_the_identification_of_key_biodiversity_areas_final_web.pdf

IUCN (2021) IUCN Red List of Threatened Species. https://www.iucnredlist.org/ Accessed on 30 April 2021.

Jakarta Post (2020) Indonesia cocoa to see deep dip, second-worst globally. https://www.thejakartapost.com/news/2020/10/06/indonesian-cocoa-to-see-deep-dip-second-worst-globally-icco.html Accessed on 15 July 2021.

JATAM (2024) Catatan Akhir Tahun 2024 & Proyeksi 2025: Bencana Ekstraktivisme yang Terorganisir di Maluku Utara. https://jatam.org/id/lengkap/Catahu-2024-Maluku-Utara

JICA (2024) Maps of JICA major projects. https://efaidnbmnnnibpcajpcglclefindmkaj/https://libportal.jica.go.jp/library/Data/PlanInOperation-e/SoutheastAsia/006_Indonesia-e.pdf

KBA Standards and Appeals Committee (2019). Guidelines for using a Global Standard for the Identification of Key Biodiversity Areas. Version 1.0. https://doi.org/10.2305/IUCN.CH.2019.KBA.1.0.en

Kelly, J., Rahman, A., Grass, I., Tasirin, J. S. and Waltert, M. (2017). Avifaunal status updates, range extensions and potential new taxa on the lesser Sangihe and Talaud islands, Indonesia. *Raffles Bull. Zool.* 65(9): 482-496.

Koch, A. (2012) *Discovery, diversity and distribution of the amphibians and reptiles of Sulawesi and its offshore islands.* Frankfurt am Main: Edition Chimaira

Kottelat, M., Whitten, A. J., Kartikasari, S. N. and Wirjoatmodjo, S. (1993) *Freshwater fishes of western Indonesia and Sulawesi.* Hong Kong: Periplus Editions.

Latuamury, B., Aponno, H. S., Marasabessy, H., Hadijah, M. H. and Imlabla, W. N. (2020). The spatial dynamics of land cover change along the Wallacea corridor in the key biodiversity area 'Buano Island', Maluku, Indonesia. *Journal of Degraded and Mining Lands Management* 7(4): 2241.

Martin, R. W. (2018). Extinction and its prevention in 'island' species (Doctoral dissertation, Manchester Metropolitan University in collaboration with BirdLife International, Cambridge).

Merliyuanti, T. (2013) *Pemanfaatan data curah hujan untuk prediksi persebaran penyakit hawar daun bakteri menggunakan model SMCE (Spatial Multi Criteria Evaluation) studi kasus: tanaman padi di Kabupaten Karawang. Skripsi.* Bogor: Intitut Pertanian Bogor.

Ministry of Agriculture (2021) Luas Areal Kakao Menurut Provinsi di Indonesia, 2017-2021. Jakarta: Ministry of Agriculture.

Ministry of Economy and Development (2012), *Sustainable Development in Timor-Leste: National Report to the United Nations Conference on Sustainable Development (UNCSD) On the Run-up to Rio +20*. Dili: Ministry of Economy and Development.

Mitra Jaya Group (2025) Mining. https://mitrajaya.co.id/mining/gold Accessed on 6 August 2025.

Mittermeier, J. C. (2014). *Avian biogeography and conservation in Eastern Indonesia.* Baton Rouge: Louisiana State University and Agricultural & Mechanical College.

Mokodongan, D. F., Tanaka, R. and Yamahira, K. (2014). A new ricefish of the genus *Oryzias* (Beloniformes, Adrianichthyidae) from lake Tiu, central Sulawesi, Indonesia. *Copeia* 2014(3): 561-567.

Monk, K. A., de Fretes, Y. and Lilley, G. (1997) *The ecology of Nusa Tenggara and Maluku*. Singapore: Periplus Editions.

OECD (2020) Indonesia: OECD Tourism Trends and Policies 2020. https://www.oecd-ilibrary.org/sites/6c4fc1cd-en/index.html?itemId=/content/component/6c4fc1cd-en Accessed on 15 July 2021.

OECD (2025) OECD Data Explorer https://data-explorer.oecd.org/vis?df[ds]=DisseminateFinalBoost&df[id]=DSD_CRS%40DF_CRS&df[ag]=OECD.DCD.FSD&dq=ALLD%2BALLM.IDN.1000.100._T._T.D.Q._T..&pd=2002%2C2023&to[TIME_PERIOD]=false&vw=tb Accessed on 18 August 2025.

Ollivaud, P. and Haxton, P. (2019) Making the most of tourism in Indonesia to promote sustainable regional development. OECD Economics Department working paper No.1535. Paris: OECD.

Pernice, M. and Hughes, D. J. (2019) Forecasting global coral bleaching. *Nat. Clim. Chang.* 9: 803–804. https://doi.org/10.1038/s41558-019-0593-7

Pörtner, H.-O. *et al*. (2021) IPBES-IPCC co-sponsored workshop report on biodiversity and climate change; IPBES and IPCC. DOI:10.5281/zenodo.4782538

Poulsen, A. D. (2012) *Etlingera of Sulawesi*. Natural History Publications (Borneo) Sdn. Bhd, in association with Royal Botanic Garden Edinburgh and University of Oslo Natural History Museum, Kota Kinabalu (Sabah, Malaysia), Edinburgh (United Kingdom) and Oslo (Norway).

Pusparini, W., Cahyana, A., Grantham, H. S., Maxwell, S., Soto-Navarro, C. and Macdonald, D. W. (2023). A bolder conservation future for Indonesia by prioritising biodiversity, carbon and unique ecosystems in Sulawesi. *Scientific Reports* 13(1): 842.

Rejlková, M. and Iqram, M. (2024). Endemic crabs from ancient Sulawesi lakes under double threat. *Oryx* 58(1): 13-14.

Republic of Indonesia (2022) Enhanced Nationally Determined Contribution. https://unfccc.int/sites/default/files/NDC/2022-09/23.09.2022_Enhanced%20NDC%20Indonesia.pdf Accessed on 17 August 2025.

Reuters (2021a) Exclusive: facing green pressure, Indonesia halts deep-sea mining disposal. https://www.reuters.com/article/us-indonesia-mining-environment-exclusiv-idUSKBN2A50UV/ Accessed on 15 July 2021.

Reuters (2021b) Indonesia says 3 nickel smelters to be completed and operational this year. https://www.reuters.com/article/indonesia-nickel-smelter-idUSL3N2NQ1MG Accessed on 8 June 2021.

Rheindt, F. E., Prawiradilaga, D. M. Ashari, H., Suparno, Gwee, C. Y., Lee, G. W. X., Wu, M. Y. and Ng, N. S. R. (2020) A lost world in Wallacea: description of a montane

archipelagic avifauna. *Science* 367(6474): 167-170. https://www.science.org/doi/10.1126/science.aax2146

von Rintelen, T., Stelbrink, B., Marwoto, R. M. and Glaubrecht, M. (2014). A snail perspective on the biogeography of Sulawesi, Indonesia: origin and intra-island dispersal of the viviparous freshwater gastropod Tylomelania. *PLoS One* 9(6): e98917.

Setiahadi, R., Sari, S. R. K, Maryudi, A. and Kalimirah, J. (2020) Monitoring Implementation of the EU-Indonesia's VPA on SME Livelihood. *International Journal of forestry Research*, http://dx.doi.org/10.1155/2020/4327802

Shekelle, M., Groves, C. P., Maryanto, I., Mittermeier, R. A., Salim, A. and Springer, M. S. (2019). A New Tarsier Species from the Togean Islands of Central Sulawesi, Indonesia, with References to Wallacea and Conservation on Sulawesi. *Primate Conservation* 2019(33): 65-73.

Sully, S., Burkepile, D.E., Donovan, M.K. *et al.* (2019) A global analysis of coral bleaching over the past two decades. *Nat Commun* 2019 (10): 1264. https://doi.org/10.1038/s41467-019-09238-2

Sumiati, Musdalipa, Darhyati, A. T., Fitriyah, A. T., Baharuddin and Feng Ma (2020) The impact of climate change on agricultural production with a cases study of Lake Tempe, district of Wajo, south Sulawesi. *Eurasian Journal of Biosciences* 14(2): 6761-6771.

Supriatna, J., Shekelle, M., Fuad, H. A., Winarni, N. L., Dwiyahreni, A. A., Farid, M. and Zakaria, Z. (2020) Deforestation on the Indonesian island of Sulawesi and the loss of primate habitat. *Global Ecology and Conservation* 24: e01205.

TanahKita (2025) Dashboard Sebaran Konflik & Wilayah Kelola. https://tanahkita.id/ Accessed on 27 August 2025.

UNDP (2025a) Essential ecosystem defined. https://www.undp.org/sites/g/files/zskgke326/files/migration/gcp/UNDP_GCP_Indonesia---Essential-Ecosystem-Defined.pdf Accessed on 27 August 2025.

UNDP (2025b) Small Grants Programme. https://www.undp.org/timor-leste/projects/small-grants-programme Accessed on 28 August 2025.

USGS (2020) US Geological Survey, Mineral Commodity Summaries, January 2020. Nickel Data Sheet-Mineral Commodity Summaries 2020 (usgs.gov) Accessed on 15 July 2021.

Voigt, M., Supriatna, J., Deere, N. J., Kastanya, A., Mitchell, S. L., Rosa, I. M. and Struebig, M. J. (2021). Emerging threats from deforestation and forest fragmentation in the Wallacea centre of endemism. *Environmental Research Letters* 16(9): 094048.

Whitten, A. J., Mustafa, M. and Henderson G. S. (1987) *The ecology of Sulawesi*. Yogyakarta: Gadjah Mada University Press.

Wijaya, N. and Furqan, A. (2018) Coastal Tourism and Climate-related Disasters in an Archipelago Country of Indonesia: Tourist's Perspective. *Procedia Engineering* 212: 535-542. https://doi.org/10.1016/j.proeng.2018.01.069

Wood, P., Hanom Bashari, Agus Hermansyah, Jihad S. Udin, Hilda Lionata, Shinta Pardede, Ria Saryanthi and Bambang Tetuka. (2015). Defining Priorities in the Midst of Uncertainty: The CEPF Ecosystem Profile Process for Wallacea. *TAPROBANICA* 7(3): 126–133.

World Bank (1999) Report of the joint assessment mission to East Timor: Summary Paper. https://reliefweb.int/report/timor-leste/report-joint-assessment-mission-east-timor-summary-paper Accessed on 14 August 2025.

World Bank (2013) Country Partnership Strategy for the Democratic Republic of Timor-Leste for the Period FY2013-FY2017. http://documents1.worldbank.org/curated/en/927031468131984331/pdf/752630CORRIGEN0C0disclosed030260130.pdf

World Bank (2021) GDP per capita (constant 2010 US$) Timor-Leste. GDP per capita (constant 2010 US$)-Timor-Leste | Data (worldbank.org) Accessed on 15 July 2021.

World Bank Group (2025) Net ODA received (% of GNI)-Indonesia. https://data.worldbank.org/indicator/DT.ODA.ODAT.GN.ZS?locations=ID Accessed on 18 August 2025.

APPENDIX 1. SPECIES OUTCOMES IN WALLACEA

No.	Species	IUCN Status
	Terrestrial mammals	
1	*Acerodon celebensis*	VU
2	*Acerodon humilis*	EN
3	*Acerodon mackloti*	VU
4	*Ailurops melanotis*	CR
5	*Ailurops ursinus*	VU
6	*Babyrousa babyrussa*	VU
7	*Babyrousa celebensis*	VU
8	*Babyrousa togeanensis*	EN
9	*Boneia bidens*	VU
10	*Bubalus depressicornis*	EN
11	*Bubalus quarlesi*	EN
12	*Bunomys coelestis*	EN
13	*Bunomys fratrorum*	VU
14	*Bunomys prolatus*	EN
15	*Echiothrix centrosa*	VU
16	*Echiothrix leucura*	EN
17	*Eropeplus canus*	VU
18	*Haeromys minahassae*	VU
19	*Harpyionycteris celebensis*	VU
20	*Hyosciurus ileile*	VU
21	*Kerivoula flora*	VU
22	*Komodomys rintjanus*	VU
23	*Macaca fascicularis*	VU
24	*Macaca hecki*	VU
25	*Macaca maura*	EN
26	*Macaca nigra*	CR
27	*Macaca nigrescens*	VU
28	*Macaca ochreata*	VU
29	*Macaca tonkeana*	VU
30	*Macrogalidia musschenbroekii*	VU
31	*Manis javanica*	CR
32	*Margaretamys christinae*	EN
33	*Maxomys wattsi*	EN
34	*Megaerops kusnotoi*	VU
35	*Melomys aerosus*	EN
36	*Melomys bannisteri*	EN
37	*Melomys caurinus*	EN
38	*Melomys fraterculus*	EN
39	*Melomys talaudium*	EN
40	*Neopteryx frosti*	EN
41	*Nesoromys ceramicus*	EN
42	*Nycteris javanica*	VU
43	*Nyctimene minutus*	VU
44	*Nyctimene rabori*	EN
45	*Paulamys naso*	EN
46	*Phalanger matabiru*	VU
47	*Prosciurillus weberi*	EN
48	*Pteropus caniceps*	VU
49	*Pteropus chrysoproctus*	VU
50	*Pteropus conspicillatus*	EN
51	*Pteropus griseus*	VU
52	*Pteropus melanopogon*	EN
53	*Pteropus ocularis*	VU
54	*Pteropus temminckii*	VU
55	*Rattus hainaldi*	EN
56	*Rhinolophus belligerator*	EN
57	*Rhinolophus canuti*	VU
58	*Rhinolophus montanus*	EN
59	*Rhynchomeles prattorum*	EN
60	*Rubrisciurus rubriventer*	VU
61	*Suncus mertensi*	EN
62	*Syconycteris carolinae*	VU
63	*Taeromys taerae*	VU
64	*Tarsius dentatus*	VU
65	*Tarsius fuscus*	VU
66	*Tarsius niemitzi*	EN
67	*Tarsius pelengensis*	EN
68	*Tarsius pumilus*	EN
69	*Tarsius sangirensis*	EN
70	*Tarsius spectrumgurskyae*	VU
71	*Tarsius supriatnai*	VU
72	*Tarsius tarsier*	VU
73	*Tarsius tumpara*	CR
74	*Tarsius wallacei*	VU
75	*Trachypithecus auratus*	VU
	Birds	
76	*Acridotheres cinereus*	VU

No.	Species	IUCN Status
77	*Acridotheres tertius*	CR
78	*Actenoides regalis*	VU
79	*Aethopyga duyvenbodei*	EN
80	*Alopecoenas hoedtii*	EN
81	*Amaurornis magnirostris*	VU
82	*Aramidopsis plateni*	VU
83	*Cacatua alba*	EN
84	*Cacatua moluccensis*	VU
85	*Cacatua sulphurea*	CR
86	*Calidris tenuirostris*	EN
87	*Ceyx sangirensis*	CR
88	*Charmosyna toxopei*	CR
89	*Coracornis sanghirensis*	CR
90	*Corvus florensis*	EN
91	*Corvus unicolor*	CR
92	*Cyornis sanfordi*	EN
93	*Ducula pickeringii*	VU
94	*Eclectus cornelia*	EN
95	*Eclectus riedeli*	VU
96	*Egretta eulophotes*	VU
97	*Eos histrio*	EN
98	*Erythropitta caeruleitorques*	EN
99	*Erythropitta inspeculata*	VU
100	*Erythropitta palliceps*	EN
101	*Eulipoa wallacei*	VU
102	*Eurostopodus diabolicus*	VU
103	*Eutrichomyias rowleyi*	CR
104	*Ficedula bonthaina*	EN
105	*Fregata andrewsi*	CR
106	*Geokichla interpres*	EN
107	*Gorsachius goisagi*	VU
108	*Gracula venerata*	EN
109	*Gymnocrex rosenbergii*	VU
110	*Gymnocrex talaudensis*	EN
111	*Habroptila wallacii*	VU
112	*Hydrobates matsudairae*	VU
113	*Hylocitrea bonthaina*	EN
114	*Hypsipetes platenae*	CR
115	*Leptoptilos javanicus*	VU
116	*Lonchura oryzivora*	EN
117	*Loriculus flosculus*	VU

No.	Species	IUCN Status
118	*Lorius domicella*	EN
119	*Lorius garrulus*	VU
120	*Macrocephalon maleo*	EN
121	*Madanga ruficollis*	EN
122	*Megapodius bernsteinii*	VU
123	*Megapodius tenimberensis*	VU
124	*Mycteria cinerea*	EN
125	*Myzomela batjanensis*	VU
126	*Ninox ios*	VU
127	*Ninox sumbaensis*	EN
128	*Nisaetus floris*	CR
129	*Numenius madagascariensis*	EN
130	*Onychoprion aleuticus*	VU
131	*Otus alfredi*	EN
132	*Otus mendeni*	VU
133	*Otus siaoensis*	CR
134	*Papasula abbotti*	EN
135	*Philemon fuscicapillus*	VU
136	*Pseudobulweria becki*	CR
137	*Pterodroma sandwichensis*	EN
138	*Ptilinopus dohertyi*	VU
139	*Ptilinopus granulifrons*	VU
140	*Puffinus heinrothi*	VU
141	*Ramphiculus meridionalis*	VU
142	*Ramphiculus subgularis*	VU
143	*Rhabdotorrhinus exarhatus*	VU
144	*Rhyticeros cassidix*	VU
145	*Rhyticeros everetti*	EN
146	*Scolopax rochussenii*	EN
147	*Symposiachrus boanensis*	CR
148	*Symposiachrus everetti*	EN
149	*Symposiachrus sacerdotum*	EN
150	*Tanygnathus gramineus*	VU
151	*Thalasseus bernsteini*	CR
152	*Todiramphus funebris*	VU
153	*Treron floris*	VU
154	*Treron psittaceus*	EN
155	*Trichoglossus forsteni*	EN
156	*Turnix everetti*	VU
157	*Tyto inexspectata*	VU
158	*Tyto nigrobrunnea*	VU

No.	Species	IUCN Status
159	*Zosterops nehrkorni*	CR
	Terrestrial/freshwater reptiles	
160	*Amyda cartilaginea*	VU
161	*Chelodina mccordi*	CR
162	*Cuora amboinensis*	EN
163	*Gehyra barea*	EN
164	*Indotestudo forstenii*	EN
165	*Indotyphlops schmutzi*	EN
166	*Leucocephalon yuwonoi*	CR
167	*Ophiophagus hannah*	VU
168	*Python bivittatus*	VU
169	*Varanus komodoensis*	VU
	Amphibians	
170	*Chalcorana macrops*	VU
171	*Limnonectes arathooni*	VU
172	*Limnonectes heinrichi*	VU
173	*Limnonectes microtympanum*	EN
174	*Litoria rueppelli*	VU
175	*Occidozyga floresiana*	VU
176	*Occidozyga tompotika*	CR
177	*Oreophryne celebensis*	VU
178	*Oreophryne monticola*	EN
179	*Oreophryne rookmaakeri*	EN
180	*Oreophryne variabilis*	VU
181	*Oreophryne zimmeri*	EN
182	*Rhacophorus monticola*	VU
	Freshwater fishes	
183	*Adrianichthys kruyti*	(PE) CR
184	*Adrianichthys roseni*	(PE) CR
185	*Craterocephalus laisapi*	EN
186	*Dermogenys orientalis*	VU
187	*Dermogenys weberi*	VU
188	*Glossogobius mahalonensis*	EN
189	*Marosatherina ladigesi*	VU
190	*Mugilogobius adeia*	EN
191	*Mugilogobius amadi*	CR
192	*Mugilogobius latifrons*	EN
193	*Mugilogobius sarasinorum*	EN
194	*Nomorhamphus celebensis*	EN
195	*Nomorhamphus lanceolatus*	EN
196	*Nomorhamphus sagittarius*	EN
197	*Nomorhamphus towoetii*	VU
198	*Oryzias asinua*	EN
199	*Oryzias hadiatyae*	VU
200	*Oryzias soerotoi*	CR
201	*Oryzias timorensis*	PE CR
202	*Oryzias woworae*	EN
203	*Pandaka pygmaea*	CR
204	*Paratherina labiosa*	CR
205	*Stupidogobius flavipinnis*	VU
206	*Telmatherina bonti*	EN
207	*Telmatherina wahjui*	EN
208	*Tondanichthys kottelati*	CR
209	*Xenopoecilus bonneorum*	EN
210	*Xenopoecilus poptae*	EN
211	*Xenopoecilus sarasinorum*	CR
	Calanoids	
212	*Neodiaptomus lymphatus*	VU
	Freshwater decapods	
213	*Caridina acutirostris*	VU
214	*Caridina caerulea*	VU
215	*Caridina dennerli*	PE CR
216	*Caridina ensifera*	VU
217	*Caridina glaubrechti*	CR
218	*Caridina holthuisi*	EN
219	*Caridina lanceolata*	CR
220	*Caridina leclerci*	VU
221	*Caridina linduensis*	CR
222	*Caridina lingkonae*	CR
223	*Caridina loehae*	CR
224	*Caridina longidigita*	VU
225	*Caridina masapi*	CR
226	*Caridina parvula*	CR
227	*Caridina profundicola*	CR
228	*Caridina sarasinorum*	VU
229	*Caridina schenkeli*	VU
230	*Caridina spinata*	CR
231	*Caridina spongicola*	CR
232	*Caridina striata*	CR
233	*Caridina tenuirostris*	CR
234	*Caridina woltereckae*	CR
235	*Marosina brevirostris*	VU

No.	Species	IUCN Status
236	*Marosina longirostris*	VU
237	*Migmathelphusa olivacea*	EN
238	*Nautilothelphusa zimmeri*	EN
239	*Parathelphusa crocea*	VU
240	*Parathelphusa ferruginea*	EN
241	*Parathelphusa pantherina*	EN
242	*Parathelphusa possoensis*	VU
243	*Parisia deharvengi*	VU
244	*Sundathelphusa minahassae*	VU
245	*Sundathelphusa rubra*	VU
246	*Syntripsa flavichela*	EN
247	*Syntripsa matannensis*	EN
	Freshwater mollusks	
248	*Corbicula possoensis*	EN
249	*Miratesta celebensis*	VU
250	*Sulawesidrobia abreui*	CR
251	*Sulawesidrobia anceps*	CR
252	*Sulawesidrobia bicolor*	CR
253	*Sulawesidrobia datar*	PE CR
254	*Sulawesidrobia mahalonaensis*	CR
255	*Sulawesidrobia megalodon*	CR
256	*Sulawesidrobia perempuan*	CR
257	*Sulawesidrobia soedjatmokoi*	CR
258	*Sulawesidrobia towutiensis*	CR
259	*Sulawesidrobia yunusi*	PE CR
260	*Tylomelania abendanoni*	CR
261	*Tylomelania amphiderita*	EN
262	*Tylomelania bakara*	CR
263	*Tylomelania baskasti*	CR
264	*Tylomelania confusa*	CR
265	*Tylomelania gemmifera*	EN
266	*Tylomelania hannelorae*	CR
267	*Tylomelania inconspicua*	CR
268	*Tylomelania insulaesacrae*	CR
269	*Tylomelania kristinae*	EN
270	*Tylomelania kruimeli*	CR
271	*Tylomelania lalemae*	EN
272	*Tylomelania mahalonensis*	CR
273	*Tylomelania marwotoae*	EN
274	*Tylomelania masapensis*	CR
275	*Tylomelania matannensis*	EN
276	*Tylomelania palicolarum*	EN
277	*Tylomelania patriarchalis*	EN
278	*Tylomelania sarasinorum*	EN
279	*Tylomelania sinabartfeldi*	CR
280	*Tylomelania tominangensis*	CR
281	*Tylomelania towutensis*	EN
282	*Tylomelania towutica*	EN
283	*Tylomelania turriformis*	CR
284	*Tylomelania wesseli*	CR
285	*Tylomelania wolterecki*	CR
286	*Tylomelania zeamais*	PE CR
	Butterflies and moths	
287	*Euploea caespes*	EN
288	*Euploea cordelia*	VU
289	*Euploea magou*	VU
290	*Graphium stresemanni*	VU
291	*Idea tambusisiana*	VU
292	*Ideopsis oberthurii*	VU
293	*Ornithoptera aesacus*	VU
294	*Papilio jordani*	VU
295	*Papilio neumoegeni*	VU
296	*Parantica dabrerai*	VU
297	*Parantica kuekenthali*	EN
298	*Parantica philo*	VU
299	*Parantica sulewattan*	EN
300	*Parantica timorica*	EN
301	*Parantica toxopei*	VU
302	*Parantica wegneri*	VU
303	*Troides dohertyi*	VU
304	*Troides prattorum*	VU
	Dragonflies and damselflies	
305	*Drepanosticta hamulifera*	VU
306	*Macromia irina*	VU
307	*Nososticta phoenissa*	VU
308	*Oligoaeschna venatrix*	VU
309	*Palaeosynthemis alecto*	VU
310	*Paragomphus tachyerges*	VU
311	*Procordulia lompobatang*	EN
312	*Protosticta gracilis*	CR
313	*Protosticta rozendalorum*	CR

No.	Species	IUCN Status
	Ants, bees and wasps	
314	*Megachile pluto*	VU
	Fungi	
315	*Calostoma insigne*	EN
	Vascular plants	
316	*Actinodaphne rumphii*	CR
317	*Afrohybanthus verbi-divini*	VU
318	*Agathis dammara*	VU
319	*Aglaia ceramica*	VU
320	*Aglaia smithii*	VU
321	*Aglaia speciosa*	VU
322	*Anisoptera thurifera*	VU
323	*Aquilaria cumingiana*	VU
324	*Avicennia rumphiana*	VU
325	*Beilschmiedia gigantocarpa*	EN
326	*Callicarpa cinnamomea*	EN
327	*Callicarpa pseudoverticillata*	EN
328	*Camptostemon philippinense*	EN
329	*Chloothamnus reholttumianus*	VU
330	*Cinnamomum culilaban*	EN
331	*Cinnamomum pilosum*	PE (EN)
332	*Cinnamomum polderi*	EN
333	*Cinnamomum subaveniopsis*	EN
334	*Cinnamomum sulavesianum*	EN
335	*Clethra javanica*	VU
336	*Cryptocarya calandoi*	EN
337	*Cryptocarya celebica*	EN
338	*Cryptocarya ceramica*	CR
339	*Cryptocarya crassinerviopsis*	EN
340	*Cryptocarya forbesii*	EN
341	*Cryptocarya microcos*	EN
342	*Cryptocarya schoddei*	VU
343	*Cryptocarya sulavesiana*	CR
344	*Cryptocarya sumbawaensis*	CR
345	*Cryptocarya viridiflora*	VU
346	*Cupaniopsis strigosa*	VU
347	*Cycas falcata*	VU
348	*Dehaasia celebica*	VU
349	*Dendrobium bandaense*	CR
350	*Dendrobium militare*	CR
351	*Dendrobium pseudoconanthum*	EN
352	*Dendrobium taurulinum*	EN
353	*Dendrobium violascens*	EN
354	*Dendrochilum longipedicellatum*	VU
355	*Diospyros celebica*	VU
356	*Dipterocarpus retusus*	EN
357	*Elattostachys erythrocarpa*	VU
358	*Endiandra chartacea*	CR
359	*Endiandra sulavesiana*	VU
360	*Erythrina euodiphylla*	VU
361	*Etlingera aulocheilos*	EN
362	*Etlingera biloba*	EN
363	*Etlingera borealis*	EN
364	*Etlingera caudata*	CR
365	*Etlingera chlorodonta*	CR
366	*Etlingera cylindrica*	EN
367	*Etlingera doliiformis*	CR
368	*Etlingera eburnea*	EN
369	*Etlingera echinulata*	EN
370	*Etlingera flavovirens*	CR
371	*Etlingera heliconiifolia*	VU
372	*Etlingera hyalina*	EN
373	*Etlingera mucida*	CR
374	*Etlingera mucronata*	EN
375	*Etlingera orophila*	EN
376	*Etlingera penicillata*	EN
377	*Etlingera serrata*	CR
378	*Etlingera spinulosa*	EN
379	*Etlingera sublimata*	EN
380	*Etlingera tubilabrum*	VU
381	*Etlingera urophylla*	CR
382	*Etlingera xanthantha*	CR
383	*Etlingera yessiae*	VU
384	*Eucalyptus orophila*	CR
385	*Eucalyptus urophylla*	EN
386	*Goniothalamus majestatis*	VU
387	*Guioa asquamosa*	VU
388	*Guioa malukuensis*	VU
389	*Guioa patentinervis*	VU
390	*Hopea celebica*	EN
391	*Hopea gregaria*	EN
392	*Hopea sangal*	VU

No.	Species	IUCN Status
393	*Horsfieldia decalvata*	VU
394	*Horsfieldia talaudensis*	VU
395	*Kalappia celebica*	VU
396	*Kibatalia wigmani*	VU
397	*Knema celebica*	VU
398	*Knema matanensis*	VU
399	*Knema steenisii*	VU
400	*Lindera apoensis*	VU
401	*Litsea albida*	VU
402	*Litsea formanii*	EN
403	*Litsea forstenii*	EN
404	*Madhuca betis*	VU
405	*Madhuca boerlageana*	CR
406	*Magnolia sulawesiana*	EN
407	*Mammea timorensis*	VU
408	*Mangifera pedicellata*	VU
409	*Mangifera rufocostata*	VU
410	*Mangifera sumbawaensis*	VU
411	*Mangifera transversalis*	VU
412	*Manilkara fasciculata*	VU
413	*Manilkara kanosiensis*	EN
414	*Myristica alba*	VU
415	*Myristica devogelii*	VU
416	*Myristica fissurata*	VU
417	*Myristica kjellbergii*	VU
418	*Myristica perlaevis*	VU
419	*Myristica pubicarpa*	VU
420	*Myristica robusta*	VU
421	*Myristica ultrabasica*	VU
422	*Nepenthes danseri*	VU
423	*Nepenthes pitopangii*	VU
424	*Nothaphoebe elata*	VU
425	*Palaquium bataanense*	VU
426	*Paphiopedilum bullenianum*	EN
427	*Paphiopedilum gigantifolium*	CR
428	*Paphiopedilum intaniae*	CR
429	*Paphiopedilum lowii*	EN
430	*Paphiopedilum mastersianum*	EN
431	*Paphiopedilum sangii*	CR
432	*Paphiopedilum schoseri*	CR
433	*Pericopsis mooniana*	VU

No.	Species	IUCN Status
434	*Podocarpus polystachyus*	VU
435	*Pterocarpus indicus*	EN
436	*Pterospermum blumeanum*	EN
437	*Santalum album*	VU
438	*Shorea montigena*	CR
439	*Shorea selanica*	CR
440	*Sympetalandra schmutzii*	VU
441	*Syzygium contiguum*	EN
442	*Syzygium devogelii*	EN
443	*Syzygium galanthum*	EN
444	*Tabernaemontana remota*	VU
445	*Taxus wallichiana*	EN
446	*Terminalia kangeanensis*	VU
447	*Vatica flavovirens*	CR
448	*Zingiber ultralimitale*	VU
	Marine mammals	
449	*Balaenoptera borealis*	EN
450	*Balaenoptera musculus*	EN
451	*Balaenoptera physalus*	EN
452	*Dugong dugon*	VU
453	*Physeter macrocephalus*	VU
	Marine reptiles	
454	*Caretta caretta*	EN
455	*Chelonia mydas*	EN
456	*Dermochelys coriacea*	VU
457	*Eretmochelys imbricata*	CR
458	*Lepidochelys olivacea*	VU
	Marine fishes	
459	*Aetobatus ocellatus*	EN
460	*Aetomylaeus nichofii*	VU
461	*Albula glossodonta*	VU
462	*Alopias pelagicus*	VU
463	*Alopias superciliosus*	VU
464	*Amblyglyphidodon batunai*	VU
465	*Amblyglyphidodon ternatensis*	VU
466	*Anguilla borneensis*	VU
467	*Anoxypristis cuspidata*	EN
468	*Argyrosomus japonicus*	EN
469	*Bolbometopon muricatum*	VU
470	*Carcharhinus albimarginatus*	VU
471	*Carcharhinus falciformis*	VU

No.	Species	IUCN Status
472	*Carcharhinus hemiodon*	CR
473	*Carcharhinus longimanus*	VU
474	*Carcharhinus obscurus*	VU
475	*Carcharhinus plumbeus*	VU
476	*Carcharhinus tjutjot*	VU
477	*Cetorhinus maximus*	EN
478	*Chaenogaleus macrostoma*	VU
479	*Cheilinus undulatus*	EN
480	*Ecsenius randalli*	VU
481	*Epinephelus fuscoguttatus*	VU
482	*Epinephelus polyphekadion*	VU
483	*Eusphyra blochii*	EN
484	*Eviota pamae*	VU
485	*Glaucostegus typus*	VU
486	*Gobiodon aoyagii*	VU
487	*Gobiodon erythrospilus*	VU
488	*Hemigaleus microstoma*	VU
489	*Himantura leoparda*	VU
490	*Himantura uarnak*	VU
491	*Himantura undulata*	VU
492	*Hippocampus barbouri*	VU
493	*Hippocampus comes*	VU
494	*Hippocampus histrix*	VU
495	*Hippocampus kelloggi*	VU
496	*Hippocampus kuda*	VU
497	*Hippocampus mohnikei*	VU
498	*Hippocampus spinosissimus*	VU
499	*Hippocampus trimaculatus*	EN
500	*Isurus oxyrinchus*	VU
501	*Isurus paucus*	EN
502	*Lamiopsis temmincki*	VU
503	*Latimeria menadoensis*	VU
504	*Maculabatis gerrardi*	VU
505	*Makaira nigricans*	VU
506	*Meiacanthus abruptus*	VU
507	*Mobula alfredi*	VU
508	*Mobula birostris*	VU
509	*Mobula eregoodoo*	EN
510	*Mobula kuhlii*	EN
511	*Mobula mobular*	EN
512	*Mobula tarapacana*	EN
513	*Mobula thurstoni*	EN
514	*Mola mola*	VU
515	*Nebrius ferrugineus*	VU
516	*Negaprion acutidens*	VU
517	*Odontaspis ferox*	VU
518	*Oxymonacanthus longirostris*	VU
519	*Pateobatis fai*	VU
520	*Pateobatis jenkinsii*	VU
521	*Plectropomus areolatus*	VU
522	*Pristis pristis*	CR
523	*Pristis zijsron*	VU
524	*Pterapogon kauderni*	EN
525	*Rhina ancylostoma*	CR
526	*Rhincodon typus*	EN
527	*Rhinoptera javanica*	VU
528	*Rhynchobatus australiae*	CR
529	*Sphyrna lewini*	CR
530	*Sphyrna mokarran*	CR
531	*Squalus montalbani*	VU
532	*Stegostoma tigrinum*	EN
533	*Taeniurops meyeni*	VU
534	*Thunnus maccoyii*	CR
535	*Thunnus obesus*	VU
536	*Urogymnus asperrimus*	VU
537	*Urogymnus granulatus*	VU
	Marine mollusks	
538	*Tridacna derasa*	VU
539	*Tridacna gigas*	VU
	Sea cucumbers	
540	*Actinopyga echinites*	VU
541	*Actinopyga mauritiana*	VU
542	*Actinopyga miliaris*	VU
543	*Holothuria fuscogilva*	VU
544	*Holothuria lessoni*	EN
545	*Holothuria scabra*	EN
546	*Holothuria whitmaei*	EN
547	*Stichopus herrmanni*	VU
548	*Thelenota ananas*	EN
	Marine decapods	
549	*Tachypleus tridentatus*	EN
550	*Birgus latro*	VU

No.	Species	IUCN Status
	Corals	
551	*Acanthastrea bowerbanki*	VU
552	*Acanthastrea brevis*	VU
553	*Acanthastrea faviaformis*	VU
554	*Acanthastrea hemprichii*	VU
555	*Acanthastrea ishigakiensis*	VU
556	*Acanthastrea regularis*	VU
557	*Acropora abrolhosensis*	VU
558	*Acropora aculeus*	VU
559	*Acropora acuminata*	VU
560	*Acropora anthocercis*	VU
561	*Acropora aspera*	VU
562	*Acropora awi*	VU
563	*Acropora batunai*	VU
564	*Acropora caroliniana*	VU
565	*Acropora dendrum*	VU
566	*Acropora derawanensis*	VU
567	*Acropora desalwii*	VU
568	*Acropora donei*	VU
569	*Acropora echinata*	VU
570	*Acropora elegans*	VU
571	*Acropora globiceps*	VU
572	*Acropora hoeksemai*	VU
573	*Acropora horrida*	VU
574	*Acropora indonesia*	VU
575	*Acropora jacquelineae*	VU
576	*Acropora kimbeensis*	VU
577	*Acropora kirstyae*	VU
578	*Acropora kosurini*	VU
579	*Acropora listeri*	VU
580	*Acropora loisetteae*	VU
581	*Acropora lokani*	VU
582	*Acropora lovelli*	VU
583	*Acropora microclados*	VU
584	*Acropora multiacuta*	VU
585	*Acropora palmerae*	VU
586	*Acropora paniculata*	VU
587	*Acropora papillare*	VU
588	*Acropora plumosa*	VU
589	*Acropora polystoma*	VU
590	*Acropora retusa*	VU

No.	Species	IUCN Status
591	*Acropora russelli*	VU
592	*Acropora simplex*	VU
593	*Acropora solitaryensis*	VU
594	*Acropora speciosa*	VU
595	*Acropora spicifera*	VU
596	*Acropora striata*	VU
597	*Acropora tenella*	VU
598	*Acropora turaki*	VU
599	*Acropora vaughani*	VU
600	*Acropora verweyi*	VU
601	*Acropora walindii*	VU
602	*Acropora willisae*	VU
603	*Alveopora allingi*	VU
604	*Alveopora daedalea*	VU
605	*Alveopora excelsa*	VU
606	*Alveopora fenestrata*	VU
607	*Alveopora gigas*	VU
608	*Alveopora marionensis*	VU
609	*Alveopora minuta*	EN
610	*Acropora suharsonoi*	EN
611	*Alveopora verrilliana*	VU
612	*Anacropora matthai*	VU
613	*Anacropora puertogalerae*	VU
614	*Anacropora reticulata*	VU
615	*Anacropora spinosa*	VU
616	*Astreopora cucullata*	VU
617	*Astreopora incrustans*	VU
618	*Australogyra zelli*	VU
619	*Barabattoia laddi*	VU
620	*Catalaphyllia jardinei*	VU
621	*Caulastrea curvata*	VU
622	*Caulastrea echinulata*	VU
623	*Cyphastrea agassizi*	VU
624	*Cyphastrea ocellina*	VU
625	*Echinophyllia costata*	VU
626	*Echinopora ashmorensis*	VU
627	*Euphyllia ancora*	VU
628	*Euphyllia cristata*	VU
629	*Euphyllia paraancora*	VU
630	*Euphyllia paradivisa*	VU
631	*Euphyllia paraglabrescens*	VU

No.	Species	IUCN Status
632	*Favites spinosa*	VU
633	*Fungia curvata*	VU
634	*Fungia taiwanensis*	VU
635	*Galaxea acrhelia*	VU
636	*Galaxea astreata*	VU
637	*Galaxea cryptoramosa*	VU
638	*Goniastrea ramosa*	VU
639	*Goniopora albiconus*	VU
640	*Goniopora burgosi*	VU
641	*Goniopora planulata*	VU
642	*Goniopora polyformis*	VU
643	*Halomitra clavator*	VU
644	*Heliofungia actiniformis*	VU
645	*Heliopora coerulea*	VU
646	*Isopora brueggemanni*	VU
647	*Isopora crateriformis*	VU
648	*Isopora cuneata*	VU
649	*Isopora togianensis*	VU
650	*Leptastrea aequalis*	VU
651	*Leptoria irregularis*	VU
652	*Leptoseris incrustans*	VU
653	*Leptoseris yabei*	VU
654	*Lobophyllia dentatus*	VU
655	*Lobophyllia diminuta*	EN
656	*Lobophyllia flabelliformis*	VU
657	*Lobophyllia serratus*	VU
658	*Millepora boschmai*	VU
659	*Montastrea multipunctata*	VU
660	*Montastrea salebrosa*	VU
661	*Montipora altasepta*	VU
662	*Montipora angulata*	VU
663	*Montipora australiensis*	VU
664	*Montipora cactus*	VU
665	*Montipora calcarea*	VU
666	*Montipora caliculata*	VU
667	*Montipora capricornis*	VU
668	*Montipora cebuensis*	VU
669	*Montipora cocosensis*	VU
670	*Montipora corbettensis*	VU
671	*Montipora crassituberculata*	VU
672	*Montipora delicatula*	VU

No.	Species	IUCN Status
673	*Montipora florida*	VU
674	*Montipora friabilis*	VU
675	*Montipora gaimardi*	VU
676	*Montipora hodgsoni*	VU
677	*Montipora mactanensis*	VU
678	*Montipora malampaya*	VU
679	*Montipora meandrina*	VU
680	*Montipora orientalis*	VU
681	*Montipora samarensis*	EN
682	*Montipora setosa*	EN
683	*Montipora turtlensis*	VU
684	*Montipora verruculosus*	VU
685	*Montipora vietnamensis*	VU
686	*Moseleya latistellata*	VU
687	*Mycedium steeni*	VU
688	*Nemenzophyllia turbida*	VU
689	*Pachyseris involuta*	VU
690	*Pachyseris rugosa*	VU
691	*Pavona bipartita*	VU
692	*Pavona cactus*	VU
693	*Pavona danai*	VU
694	*Pavona decussata*	VU
695	*Pavona venosa*	VU
696	*Pectinia alcicornis*	VU
697	*Pectinia lactuca*	EN
698	*Pectinia maxima*	VU
699	*Physogyra lichtensteini*	VU
700	*Platygyra yaeyamaensis*	VU
701	*Plerogyra discus*	VU
702	*Pocillopora ankeli*	VU
703	*Pocillopora danae*	VU
704	*Pocillopora elegans*	VU
705	*Porites aranetai*	VU
706	*Porites attenuata*	VU
707	*Porites cocosensis*	VU
708	*Porites cumulatus*	EN
709	*Porites eridani*	VU
710	*Porites horizontalata*	VU
711	*Porites napopora*	VU
712	*Porites nigrescens*	EN
713	*Porites ornata*	VU

No.	Species	IUCN Status
714	*Porites rugosa*	VU
715	*Porites sillimaniana*	VU
716	*Porites tuberculosa*	VU
717	*Psammocora stellata*	EN
718	*Seriatopora aculeata*	VU
719	*Seriatopora dendritica*	EN
720	*Stylocoeniella cocosensis*	EN
721	*Symphyllia hassi*	VU
722	*Turbinaria bifrons*	VU
723	*Turbinaria heronensis*	VU
724	*Turbinaria mesenterina*	VU
725	*Turbinaria patula*	VU
726	*Turbinaria peltata*	VU
727	*Turbinaria reniformis*	VU
728	*Turbinaria stellulata*	VU

APPENDIX 2. SITE OUTCOMES IN WALLACEA

No.	Code	KBA name	Bioregion	Province/ municipality	Corridor	KBA cluster	% protected	Area (ha)
1	IDN001	Kepulauan Nanusa	Sulawesi	Sulawesi Utara	Sulawesi Utara		0	33,527
2	IDN002	Perairan Karakelang Utara	Sulawesi	Sulawesi Utara	Sulawesi Utara		0	32,439
3	IDN003	Karakelang Utara	Sulawesi	Sulawesi Utara		Sangihe-Talaud	75	32,365
4	IDN004	Karakelang Selatan	Sulawesi	Sulawesi Utara		Sangihe-Talaud	70	6,463
5	IDN005	Pulau Salibabu	Sulawesi	Sulawesi Utara		Sangihe-Talaud	0	8,966
6	IDN006	Perairan Talaud Selatan	Sulawesi	Sulawesi Utara	Sulawesi Utara		0	47,326
7	IDN007	Pulau Kabaruan	Sulawesi	Sulawesi Utara		Sangihe-Talaud	0	9,377
8	IDN008	Kawaluso	Sulawesi	Sulawesi Utara	Sulawesi Utara		0	341,700
9	IDN009	Perairan Sangihe	Sulawesi	Sulawesi Utara	Sulawesi Utara		0	132,520
10	IDN010	Gunung Awu	Sulawesi	Sulawesi Utara		Sangihe-Talaud	0	3,056
11	IDN011	Tahuna	Sulawesi	Sulawesi Utara		Sangihe-Talaud	0	2,237
12	IDN012	Gunung Sahendaruman	Sulawesi	Sulawesi Utara		Sangihe-Talaud	0	4,401
13	IDN013	Mahangetang	Sulawesi	Sulawesi Utara	Sulawesi Utara		0	33,568
14	IDN014	Perairan Siau	Sulawesi	Sulawesi Utara	Sulawesi Utara		0	76,939
15	IDN015	Pulau Siau	Sulawesi	Sulawesi Utara		Sangihe-Talaud	0	11,635
16	IDN016	Perairan Tagulandang	Sulawesi	Sulawesi Utara	Sulawesi Utara		0	21,805
17	IDN017	Perairan Biaro	Sulawesi	Sulawesi Utara	Sulawesi Utara		0	16,894
18	IDN018	Perairan Likupang	Sulawesi	Sulawesi Utara	Sulawesi Utara		0	55,339
19	IDN019	Likupang	Sulawesi	Sulawesi Utara	N. Sulawesi	Minahasa	0	847
20	IDN020	Molaswori	Sulawesi	Sulawesi Utara	Sulawesi Utara		Yes	55,081
21	IDN021	Mawori	Sulawesi	Sulawesi Utara		Minahasa	100	3,870
22	IDN022	Tangkoko Dua Sudara	Sulawesi	Sulawesi Utara	N. Sulawesi	Minahasa	99	9,526
23	IDN023	Selat Lembeh	Sulawesi	Sulawesi Utara	Sulawesi Utara		0	17,598
24	IDN024	Lembeh	Sulawesi	Sulawesi Utara		Minahasa	0	1,716
25	IDN025	Gunung Klabat	Sulawesi	Sulawesi Utara	N. Sulawesi	Minahasa	0	3,540
26	IDN026	Tulaun Lalumpe	Sulawesi	Sulawesi Utara	Sulawesi Utara		0	1,272
27	IDN027	Danau Tondano	Sulawesi	Sulawesi Utara	N. Sulawesi	Minahasa	0	6,408
28	IDN028	Soputan–Manimporok	Sulawesi	Sulawesi Utara	N. Sulawesi	Minahasa	0	9,908
29	IDN029	Mahawu–Masarang	Sulawesi	Sulawesi Utara	N. Sulawesi	Minahasa	0	899
30	IDN030	Gunung Lokon	Sulawesi	Sulawesi Utara	N. Sulawesi	Minahasa	47	3,611

No.	Code	KBA name	Bioregion	Province/ municipality	Corridor	KBA cluster	% protected	Area (ha)
31	**IDN031**	**Gunung Manembo-nembo**	**Sulawesi**	**Sulawesi Utara**	**N. Sulawesi**	**Minahasa**	**88**	**4,843**
32	**IDN032**	**Perairan Arakan Wawontulap**	**Sulawesi**	**Sulawesi Utara**	**Sulawesi Utara**		**Partial**	**14,810**
33	**IDN033**	**Amurang**	**Sulawesi**	**Sulawesi Utara**	**Sulawesi Utara**		**Yes**	**24,168**
34	IDN034	Gunung Sinonsayang	Sulawesi	Sulawesi Utara	N. Sulawesi	Bolaang	0	1,091
35	IDN035	Gunung Ambang	Sulawesi	Sulawesi Utara	N. Sulawesi	Bolaang	70	20,712
36	IDN036	Gunung Simbalang	Sulawesi	Sulawesi Utara	N. Sulawesi	Bolaang	0	35,260
37	IDN037	Bogani Nani Wartabone	Sulawesi	Gorontalo	N. Sulawesi	Bolaang	68	392,074
38	IDN038	Tanjung Binerean	Sulawesi	Sulawesi Utara	N. Sulawesi	Bolaang	0	631
39	*IDN039*	*Perairan Tanjung Binerean*	*Sulawesi*	*Sulawesi Utara*			*0*	*1,632*
40	IDN040	Pantai Modisi	Sulawesi	Sulawesi Utara			0	3,349
41	IDN041	Milangodaa	Sulawesi	Sulawesi Utara	N. Sulawesi	Bolaang	0	1,106
42	IDN042	Puncak Botu	Sulawesi	Gorontalo	N. Sulawesi	Bolaang	0	409
43	IDN043	Molonggota	Sulawesi	Gorontalo	N. Sulawesi	Bolaang	0	2,209
44	IDN044	Perairan Molonggota	Sulawesi	Gorontalo			0	2,318
45	IDN045	Perairan Mas Popaya Raja	Sulawesi	Gorontalo			0	58,041
46	IDN046	Mas Popaya Raja	Sulawesi	Gorontalo		Toli-Toli	100	167
47	IDN047	Tangale	Sulawesi	Gorontalo		Toli-Toli	100	1,118
48	IDN048	Muara Paguyaman Pantai	Sulawesi	Gorontalo	N. Sulawesi	Toli-Toli	0	8,128
49	IDN049	Nantu	Sulawesi	Gorontalo	N. Sulawesi	Toli-Toli	64	52,553
50	IDN050	Dulamayo	Sulawesi	Gorontalo	N. Sulawesi	Toli-Toli	0	25,100
51	*IDN051*	*Perairan Panua*	*Sulawesi*	*Gorontalo*			*0*	*43,295*
52	IDN052	Panua	Sulawesi	Gorontalo	N. Sulawesi	Toli-Toli	100	49,908
53	IDN053	Popayato–Paguat	Sulawesi	Gorontalo	N. Sulawesi	Toli-Toli	0	71,253
54	IDN054	Gunung Ile-Ile	Sulawesi	Gorontalo	N. Sulawesi	Toli-Toli	0	23,401
55	IDN055	Tanjung Panjang	Sulawesi	Gorontalo	N. Sulawesi	Toli-Toli	99	7,494
56	IDN056	Perairan Tanjung Panjang	Sulawesi	Gorontalo			0	21,163
57	IDN057	Buol–Tolitoli	Sulawesi	Gorontalo	N. Sulawesi	Toli-Toli	0	171,394
58	IDN058	Gunung Dako	Sulawesi	Sulawesi Tengah	N. Sulawesi	Toli-Toli	35	63,537
59	*IDN059*	*Teluk Dondo*	*Sulawesi*	*Sulawesi Tengah*	*Barat Sulawesi Tengah*		*0*	*207,723*
60	IDN060	Gunung Tinombala	Sulawesi	Sulawesi Tengah	N. Sulawesi	Toli-Toli	61	45,120
61	**IDN061**	**Gunung Sojol**	**Sulawesi**	**Sulawesi Tengah**	**N. Sulawesi**	**Lindu**	**64**	**94,183**

No.	Code	KBA name	Bioregion	Province/ municipality	Corridor	KBA cluster	% protected	Area (ha)
62	**IDN062**	**Siraro**	**Sulawesi**	**Sulawesi Tengah**	**N. Sulawesi**	**Lindu**	**0**	**855**
63	IDN063	Perairan Maputi	Sulawesi	Sulawesi Tengah	Barat Sulawesi Tengah		0	12,854
64	**IDN064**	**Pasoso**	**Sulawesi**	**Sulawesi Tengah**	**C. Sulawesi**	**Lindu**	**0**	**18,752**
65	*IDN065*	*Tanjung Manimbaya*	*Sulawesi*	*Sulawesi Tengah*	*Barat Sulawesi Tengah*		*0*	*27,033*
66	**IDN066**	**Pegunungan Tokalekaju**	**Sulawesi**	**Sulawesi Barat**	**C. Sulawesi**	**Lindu**	**3**	**391,608**
67	**IDN067**	**Lore Lindu**	**Sulawesi**	**Sulawesi Tengah**	**C. Sulawesi**	**Lindu**	**80**	**250,111**
68	IDN068	Perairan Kayumaloa	Sulawesi	Sulawesi Barat	Barat Sulawesi Tengah		0	8,091
69	**IDN069**	**Tambu**	**Sulawesi**	**Sulawesi Tengah**	**C. Sulawesi**	**Lindu**	**0**	**10,043**
70	*IDN070*	*Perairan Tambu*	*Sulawesi*	*Sulawesi Tengah*			*0*	*16,171*
71	**IDN071**	**Lariang**	**Sulawesi**	**Sulawesi Barat**	**C. Sulawesi**	**Lindu**	**0**	**7,160**
72	**IDN072**	**Pambuang**	**Sulawesi**	**Sulawesi Barat**	**C. Sulawesi**	**Lindu**	**0**	**162,954**
73	**IDN073**	**Danau Poso**	**Sulawesi**	**Sulawesi Selatan**	**C. Sulawesi**	**Poso**	**36**	**68,203**
74	**IDN074**	**Morowali**	**Sulawesi**	**Sulawesi Tengah**	**C. Sulawesi**	**Sulawesi Timur**	**75**	**277,238**
75	**IDN075**	**Gunung Lumut**	**Sulawesi**	**Sulawesi Tengah**	**C. Sulawesi**	**Sulawesi Timur**	**0**	**94,226**
76	**IDN076**	**Tanjung Colo**	**Sulawesi**	**Sulawesi Tengah**	**C. Sulawesi**	**Sulawesi Timur**	**95**	**3,456**
77	**IDN077**	**Perairan Kepulauan Togean**	**Sulawesi**	**Sulawesi Tengah**	**Togean–Banggai**		**Yes**	**335,087**
78	**IDN078**	**Kepulauan Togean**	**Sulawesi**	**Sulawesi Tengah**	**C. Sulawesi**	**Togean-Banggai**	**100**	**76,396**
79	**IDN079**	**Perairan Pagimana**	**Sulawesi**	**Sulawesi Tengah**	**Togean–Banggai**		**0**	**1,079**
80	**IDN080**	**Bakiriang**	**Sulawesi**	**Sulawesi Tengah**	**C. Sulawesi**	**Sulawesi Timur**	**17**	**72,330**
81	**IDN081**	**Perairan Peleng–Banggai**	**Sulawesi**	**Sulawesi Tengah**	**Togean–Banggai**		**Partial**	**504,117**
82	**IDN082**	**Labobo–Bangkurung**	**Sulawesi**	**Sulawesi Tengah**		**Togean-Banggai**	**0**	**18,431**
83	**IDN083**	**Kokolomboi**	**Sulawesi**	**Sulawesi Tengah**	**C. Sulawesi**	**Togean-Banggai**	**0**	**50,142**
84	**IDN084**	**Bajomote–Pondipondi**	**Sulawesi**	**Sulawesi Tengah**	**C. Sulawesi**	**Togean-Banggai**	**0**	**51,578**
85	**IDN085**	**Timbong**	**Sulawesi**	**Sulawesi Tengah**		**Togean-Banggai**	**0**	**22,618**
86	**IDN086**	**Balantak**	**Sulawesi**	**Sulawesi Tengah**	**C. Sulawesi**	**Togean-Banggai**	**0**	**63,714**

No.	Code	KBA name	Bioregion	Province/ municipality	Corridor	KBA cluster	% protected	Area (ha)
87	***IDN087***	***Perairan Balantak***	***Sulawesi***	***Sulawesi Tengah***	***Togean–Banggai***		***0***	***6,211***
88	IDN088	Pulau Seho	Sulawesi	Maluku Utara		Sula	80	1,379
89	IDN089	Taliabu Utara	Sulawesi	Maluku Utara		Sula	11	77,879
90	IDN090	Perairan Taliabu Utara	Sulawesi	Maluku Utara			0	20,491
91	IDN091	Buya	Sulawesi	Maluku Utara		Sula	0	13,689
92	IDN092	Loku	Sulawesi	Maluku Utara		Sula	0	11,715
93	IDN093	Sanana	Sulawesi	Maluku Utara		Sula	0	18,491
94	IDN094	Pulau Lifamatola	Sulawesi	Maluku Utara			0	18,035
95	**IDN095**	**Feruhumpenai–Matano**	**Sulawesi**	**Sulawesi Selatan**	**C. Sulawesi**	**Malili**	**82**	**139,781**
96	**IDN096**	**Danau Mahalona**	**Sulawesi**	**Sulawesi Selatan**	**C. Sulawesi**	**Malili**	**45**	**5,106**
97	**IDN097**	**Danau Towuti**	**Sulawesi**	**Sulawesi Selatan**	**C. Sulawesi**	**Malili**	**66**	**95,062**
98	IDN098	Routa	Sulawesi	Sulawesi Selatan	C. Sulawesi	Sulawesi Tenggara	0	142,520
99	IDN099	Lamiko-miko	Sulawesi	Sulawesi Selatan			0	33,620
100	*IDN100*	*Perairan Lamiko–Miko*	*Sulawesi*	*Sulawesi Selatan*			*0*	*10,555*
101	IDN101	Mekongga	Sulawesi	Sulawesi Tenggara	C. Sulawesi	Sulawesi Tenggara	1	483,731
102	IDN102	Kepulauan Padamarang	Sulawesi	Sulawesi Tenggara			Partial	32,422
103	IDN103	Lamadae	Sulawesi	Sulawesi Tenggara	C. Sulawesi	Sulawesi Tenggara	100	650
104	IDN104	Rawa Aopa Watumohai	Sulawesi	Sulawesi Tenggara	C. Sulawesi	Sulawesi Tenggara	77	141,658
105	**IDN105**	**Teluk Lasolo–Labengki**	**Sulawesi**	**Sulawesi Tenggara**	**Sulawesi Tenggara**		**Partial**	**87,764**
106	IDN106	Nipa-nipa	Sulawesi	Sulawesi Tenggara	C. Sulawesi	Sulawesi Tenggara	100	7,821
107	**IDN107**	**Pulau Hari**	**Sulawesi**	**Sulawesi Tenggara**	**Sulawesi Tenggara**		**0**	**43,410**
108	IDN108	Tanjung Peropa	Sulawesi	Sulawesi Tenggara	C. Sulawesi	Sulawesi Tenggara	97	41,093
109	IDN109	Pulau Wawonii	Sulawesi	Sulawesi Tenggara		Sulawesi Tenggara	0	70,846
110	IDN110	Tanjung Batikolo	Sulawesi	Sulawesi Tenggara	C. Sulawesi	Sulawesi Tenggara	100	3,925
111	IDN111	Baito–Wolasi	Sulawesi	Sulawesi Tenggara	C. Sulawesi	Sulawesi Tenggara	0	23,272

No.	Code	KBA name	Bioregion	Province/ municipality	Corridor	KBA cluster	% protected	Area (ha)
112	***IDN112***	***Pesisir Tinanggea***	***Sulawesi***	***Sulawesi Tenggara***	***Sulawesi Tenggara***		***0***	***18,300***
113	**IDN113**	**Selat Tiworo**	**Sulawesi**	**Sulawesi Tenggara**	**Sulawesi Tenggara**		**Yes**	**25,575**
114	IDN114	Muna Timur	Sulawesi	Sulawesi Tenggara		Sulawesi Tenggara	0	32,476
115	IDN115	Buton Utara	Sulawesi	Sulawesi Tenggara		Sulawesi Tenggara	78	117,064
116	IDN116	Lambusango	Sulawesi	Sulawesi Tenggara		Sulawesi Tenggara	52	58,651
117	**IDN117**	**Wabula**	**Sulawesi**	**Sulawesi Tenggara**	**Sulawesi Tenggara**		**0**	**46,524**
118	IDN118	Ambuau	Sulawesi	Sulawesi Tenggara		Sulawesi Tenggara	0	3,533
119	**IDN119**	**Perairan Wakatobi**	**Sulawesi**	**Sulawesi Tenggara**	**Sulawesi Tenggara**		**Yes**	**1,315,636**
120	IDN120	Wakatobi	Sulawesi	Sulawesi Tenggara			5	45,107
121	**IDN121**	**Pulau Batu Atas**	**Sulawesi**	**Sulawesi Tenggara**	**Sulawesi Tenggara**		**Partial**	**31,650**
122	**IDN122**	**Basilika**	**Sulawesi**	**Sulawesi Tenggara**	**Sulawesi Tenggara**		**0**	**202,139**
123	IDN123	Pulau Kadatua	Sulawesi	Sulawesi Tenggara		Sulawesi Tenggara	0	2,428
124	IDN124	Gunung Watusangia	Sulawesi	Sulawesi Tenggara		Sulawesi Tenggara	0	16,910
125	**IDN125**	**Kepulauan Sagori**	**Sulawesi**	**Sulawesi Tenggara**	**Sulawesi Tenggara**		**0**	**20,640**
126	IDN126	Mambuliling	Sulawesi	Sulawesi Barat	C. Sulawesi	Latimojong-Mambuliling	0	259,604
127	IDN127	Mamuju	Sulawesi	Sulawesi Barat	C. Sulawesi	Latimojong-Mambuliling	0	17,731
128	*IDN128*	*Perairan Mamuju*	*Sulawesi*	*Sulawesi Barat*			*0*	*10,639*
129	IDN129	Pegunungan Latimojong	Sulawesi	Sulawesi Selatan	C. Sulawesi	Latimojong-Mambuliling	0	145,975
130	**IDN130**	**Danau Tempe**	**Sulawesi**	**Sulawesi Selatan**	**S. Sulawesi**	**Sulawesi Selatan**	**0**	**31,362**
131	**IDN131**	**Pallime**	**Sulawesi**	**Sulawesi Selatan**	**S. Sulawesi**	**Sulawesi Selatan**	**0**	**5,326**

No.	Code	KBA name	Bioregion	Province/ municipality	Corridor	KBA cluster	% protected	Area (ha)
132	***IDN132***	***Perairan Pallime***	***Sulawesi***	***Sulawesi Selatan***	***Sulawesi Selatan***		***0***	***34,762***
133	**IDN133**	**Cani Sirenreng**	**Sulawesi**	**Sulawesi Selatan**	**S. Sulawesi**	**Sulawesi Selatan**	**26**	**14,136**
134	**IDN134**	**Bantimurung Bulusaraung**	**Sulawesi**	**Sulawesi Selatan**	**S. Sulawesi**	**Sulawesi Selatan**	**93**	**46,723**
135	**IDN135**	**Bulurokeng**	**Sulawesi**	**Sulawesi Selatan**	**S. Sulawesi**	**Sulawesi Selatan**	**0**	**7,055**
136	**IDN136**	**Kapoposang–Pangkep–Bulurokeng**	**Sulawesi**	**Sulawesi Selatan**	**Sulawesi Selatan**		**Yes**	**366,929**
137	**IDN137**	**Komara**	**Sulawesi**	**Sulawesi Selatan**	**S. Sulawesi**	**Sulawesi Selatan**	**23**	**29,502**
138	**IDN138**	**Karaeng–Lompobattang**	**Sulawesi**	**Sulawesi Selatan**	**S. Sulawesi**	**Sulawesi Selatan**	**15**	**32,077**
139	**IDN139**	**Kepulauan Selayar**	**Sulawesi**	**Sulawesi Selatan**	**Sulawesi Selatan**		**Partial**	**307,241**
140	IDN140	Pulau Selayar	Sulawesi	Sulawesi Selatan			0	65,083
141	***IDN141***	***Taka Bonerate***	***Sulawesi***	***Sulawesi Selatan***	***Sulawesi Selatan***		***Yes***	***559,323***
142	***IDN142***	***Perairan Tana Jampea***	***Sulawesi***	***Sulawesi Selatan***	***Sulawesi Selatan***		***0***	***555,217***
143	IDN143	Pulau Tana Jampea	Sulawesi	Sulawesi Selatan			0	16,036
144	IDN144	Pulau Kalatoa	Sulawesi	Sulawesi Selatan			0	7,924
145	**IDN145**	**Morotai**	**Maluku**	**Maluku Utara**		**Halmahera**	**0**	**120,940**
146	IDN146	Pulau-pulau Pesisir Morotai	Maluku	Maluku Utara	Halmahera		0	59,275
147	**IDN147**	**Pulau Rao**	**Maluku**	**Maluku Utara**		**Halmahera**	**0**	**6,019**
148	IDN148	Loloda	Maluku	Maluku Utara	Halmahera		0	13,671
149	**IDN149**	**Galela**	**Maluku**	**Maluku Utara**	**Halmahera**	**Halmahera**	**0**	**2,027**
150	**IDN150**	**Gunung Dukono**	**Maluku**	**Maluku Utara**	**Halmahera**	**Halmahera**	**0**	**27,620**
151	IDN151	Pulau–Pulau Pesisir Tobelo	Maluku	Maluku Utara	Halmahera		0	18,844
152	IDN152	Jara-Jara	Maluku	Maluku Utara	Halmahera		0	6,610
153	**IDN153**	**Halmahera Timur**	**Maluku**	**Maluku Utara**	**Halmahera**	**Halmahera**	**46**	**186,542**
154	**IDN154**	**Hutan Bakau Dodaga**	**Maluku**	**Maluku Utara**	**Halmahera**	**Halmahera**	**0**	**1,199**
155	*IDN155*	*Teluk Wasile*	*Maluku*	*Maluku Utara*	*Halmahera*		*0*	*20,518*
156	**IDN156**	**Kao**	**Maluku**	**Maluku Utara**	**Halmahera**	**Halmahera**	**0**	**2,578**
157	IDN157	Teluk Buli	Maluku	Maluku Utara	Halmahera		0	150,724

No.	Code	KBA name	Bioregion	Province/ municipality	Corridor	KBA cluster	% protected	Area (ha)
158	**IDN158**	**Gamkonora**	**Maluku**	**Maluku Utara**	**Halmahera**	**Halmahera**	**0**	**43,546**
159	IDN159	Tanjung Bobo	Maluku	Maluku Utara	Halmahera		0	714
160	**IDN160**	**Tanah Putih**	**Maluku**	**Maluku Utara**	**Halmahera**	**Halmahera**	**0**	**5,356**
161	**IDN161**	**Rawa Sagu Ake Jailolo**	**Maluku**	**Maluku Utara**	**Halmahera**	**Halmahera**	**0**	**862**
162	IDN162	Ternate–Hiri	Maluku	Maluku Utara	Halmahera		0	5,796
163	**IDN163**	**Ternate**	**Maluku**	**Maluku Utara**		**Halmahera**	**0**	**4,546**
164	**IDN164**	**Tidore**	**Maluku**	**Maluku Utara**		**Halmahera**	**0**	**3,439**
165	**IDN165**	**Aketajawe**	**Maluku**	**Maluku Utara**	**Halmahera**	**Halmahera**	**91**	**84,590**
166	IDN166	Weda Telope	Maluku	Maluku Utara	Halmahera		0	8,618
167	**IDN167**	**Dote-Kobe**	**Maluku**	**Maluku Utara**	**Halmahera**	**Halmahera**	**0**	**14,066**
168	*IDN168*	*Perairan Dote-Kobe*	*Maluku*	*Maluku Utara*	*Halmahera*		*0*	*12,240*
169	IDN169	Kayoa	Maluku	Maluku Utara	Halmahera		0	121,369
170	**IDN170**	**Pulau Kayoa**	**Maluku**	**Maluku Utara**		**Halmahera**	**0**	**8,516**
171	**IDN171**	**Kasiruta**	**Maluku**	**Maluku Utara**	**Halmahera**	**Halmahera**	**0**	**10,956**
172	**IDN172**	**Yaba**	**Maluku**	**Maluku Utara**	**Halmahera**	**Halmahera**	**0**	**10,184**
173	**IDN173**	**Gorogoro**	**Maluku**	**Maluku Utara**	**Halmahera**	**Halmahera**	**0**	**13,084**
174	**IDN174**	**Saketa**	**Maluku**	**Maluku Utara**	**Halmahera**	**Halmahera**	**0**	**8,536**
175	IDN175	Kepulauan Widi	Maluku	Maluku Utara	Halmahera		0	40,309
176	*IDN176*	*Libobo*	*Maluku*	*Maluku Utara*	*Halmahera*		*0*	*691*
177	**IDN177**	**Tutupa**	**Maluku**	**Maluku Utara**	**Halmahera**	**Halmahera**	**0**	**8,322**
178	**IDN178**	**Gunung Sibela**	**Maluku**	**Maluku Utara**	**Halmahera**	**Halmahera**	**74**	**27,832**
179	**IDN179**	**Mandioli**	**Maluku**	**Maluku Utara**	**Halmahera**	**Halmahera**	**0**	**6,126**
180	*IDN180*	*Perairan Mandioli*	*Maluku*	*Maluku Utara*	*Halmahera*		*0*	*15,552*
181	*IDN181*	*Selat Obilatu–Malamala*	*Maluku*	*Maluku Utara*			*0*	*16,604*
182	IDN182	Obilatu	Maluku	Maluku Utara		Obi	0	1,862
183	IDN183	Danau Manis	Maluku	Maluku Utara		Obi	0	2,589
184	IDN184	Wayaloar	Maluku	Maluku Utara		Obi	0	10,926
185	IDN185	Gunung Batu Putih	Maluku	Maluku Utara		Obi	40	38,041
186	IDN186	Cabang Kuning	Maluku	Maluku Utara		Obi	0	4,812
187	*IDN187*	*Selat Obi*	*Maluku*	*Maluku Utara*			*0*	*36,989*
188	IDN188	Pulau Obit	Maluku	Maluku Utara		Obi	92	5,884
189	*IDN189*	*Perairan Pulau Obit*	*Maluku*	*Maluku Utara*			*0*	*3,955*
190	*IDN190*	*Jorongga*	*Maluku*	*Maluku Utara*	*Halmahera*		*0*	*63,530*
191	***IDN191***	***Liliali***	***Maluku***	***Maluku***	***Bentang Laut Buru***		***0***	***47,687***
192	IDN192	Gunung Kepala Madang	Maluku	Maluku	Seram–Buru	Buru	0	133,187

No.	Code	KBA name	Bioregion	Province/ municipality	Corridor	KBA cluster	% protected	Area (ha)
193	IDN193	Waemala	Maluku	Maluku	Seram–Buru	Buru	0	10,885
194	IDN194	Danau Rana	Maluku	Maluku	Seram–Buru	Buru	0	63,315
195	IDN195	Leksula	Maluku	Maluku	Seram–Buru	Buru	0	80,322
196	IDN196	Teluk Kayeli	Maluku	Maluku	Seram–Buru	Buru	0	5,746
197	***IDN197***	***Perairan Teluk Kayeli***	***Maluku***	***Maluku***	***Bentang Laut Buru***		***0***	***16,020***
198	**IDN198**	**Kelang–Kassa–Buano–Marsegu**	**Maluku**	**Maluku**	**Bentang Laut Buru**		**Partial**	**216,380**
199	**IDN199**	**Pulau Buano**	**Maluku**	**Maluku**	**Seram–Buru**	**Seram**	**0**	**13,595**
200	**IDN200**	**Gunung Sahuwai**	**Maluku**	**Maluku**	**Seram–Buru**	**Seram**	**79**	**25,965**
201	**IDN201**	**Luhu**	**Maluku**	**Maluku**	**Seram–Buru**	**Seram**	**100**	**4,944**
202	**IDN202**	**Tullen Batae**	**Maluku**	**Maluku**	**Seram–Buru**	**Seram**	**0**	**5,095**
203	**IDN203**	**Pulau Kassa**	**Maluku**	**Maluku**	**Seram–Buru**	**Seram**	**0**	**64**
204	**IDN204**	**Pegunungan Paunusa**	**Maluku**	**Maluku**	**Seram–Buru**	**Seram**	**0**	**60,060**
205	**IDN205**	**Gunung Salahutu**	**Maluku**	**Maluku**	**Seram–Buru**	**Seram**	**0**	**10,224**
206	***IDN206***	***Perairan Gunung Salahutu***	***Maluku***	***Maluku***	***Bentang Laut Buru***		***0***	***842***
207	**IDN207**	**Leitimur**	**Maluku**	**Maluku**	**Seram–Buru**	**Seram**	**0**	**18,897**
208	***IDN208***	***Leihitu***	***Maluku***	***Maluku***	***Bentang Laut Buru***		***0***	***14,112***
209	**IDN209**	**Perairan Haruku Saparua**	**Maluku**	**Maluku**	**Bentang Laut Buru**		**0**	**48,332**
210	**IDN210**	**Haruku**	**Maluku**	**Maluku**	**Seram–Buru**	**Seram**	**0**	**7,997**
211	**IDN211**	**Saparua**	**Maluku**	**Maluku**	**Seram–Buru**	**Seram**	**0**	**1,892**
212	**IDN212**	**Manusela**	**Maluku**	**Maluku**	**Seram–Buru**	**Seram**	**66**	**251,231**
213	**IDN213**	**Waebula**	**Maluku**	**Maluku**	**Seram–Buru**	**Seram**	**0**	**64,639**
214	**IDN214**	**Tanah Besar**	**Maluku**	**Maluku**	**Seram–Buru**	**Seram**	**0**	**50,004**
215	*IDN215*	*Perairan Tanah Besar*	*Maluku*	*Maluku*			*0*	*15,027*
216	*IDN216*	*Kepulauan Gorom*	*Maluku*	*Maluku*	*Busur Banda Luar*		*0*	*103,148*
217	IDN217	Perairan Kepulauan Banda	Maluku	Maluku	Bentang Laut Banda		Partial	40,153
218	IDN218	Kepulauan Banda	Maluku	Maluku			22	5,062
219	*IDN219*	*Perairan Kepulauan Tayandu*	*Maluku*	*Maluku*	*Busur Banda Luar*		*0*	*233,673*
220	IDN220	Kepulauan Tayandu	Maluku	Maluku		Kai	0	11,857
221	*IDN221*	*Perairan Tual*	*Maluku*	*Maluku*	*Busur Banda Luar*		*0*	*171,055*

No.	Code	KBA name	Bioregion	Province/ municipality	Corridor	KBA cluster	% protected	Area (ha)
222	IDN222	Pegunungan Daab–Boo	Maluku	Maluku		Kai	50	29,334
223	IDN223	Pulau Manuk	Maluku	Maluku			100	507
224	*IDN224*	*Perairan Pulau Manuk*	*Maluku*	*Maluku*	*Bentang Laut Banda*		*0*	*131*
225	IDN225	Kepulauan Lucipara	Maluku	Maluku	Bentang Laut Lucipara		0	43,386
226	IDN226	Pulau Gunung Api	Maluku	Maluku			100	93
227	IDN227	Batu Gendang	Lesser Sundas	Nusa Tenggara Barat	Sumbawa–Lombok	Lombok	4	11,922
228	*IDN228*	*Perairan Batu Gendang*	*Lesser Sundas*	*Nusa Tenggara Barat*	*Selat Lombok*		*Yes*	*6,011*
229	*IDN229*	*Lombok Barat*	*Lesser Sundas*	*Nusa Tenggara Barat*	*Selat Lombok*		*Yes*	*567*
230	IDN230	Gili Ayer–Meno–Trawangan	Lesser Sundas	Nusa Tenggara Barat	Selat Lombok		Yes	2,319
231	IDN231	Gunung Rinjani	Lesser Sundas	Nusa Tenggara Barat	Sumbawa–Lombok	Lombok	27	134,550
232	*IDN232*	*Gili Sulat–Gili Lawang*	*Lesser Sundas*	*Nusa Tenggara Barat*			*Yes*	*667*
233	*IDN233*	*Perairan Bumbang*	*Lesser Sundas*	*Nusa Tenggara Barat*			*Partial*	*33,608*
234	IDN234	Bumbang	Lesser Sundas	Nusa Tenggara Barat	Sumbawa–Lombok	Lombok	79	1,326
235	IDN235	Sekaroh	Lesser Sundas	Nusa Tenggara Barat	Sumbawa–Lombok	Lombok	0	2,622
236	*IDN236*	*Lunyuk Besar*	*Lesser Sundas*	*Nusa Tenggara Barat*			*0*	*9,430*
237	IDN237	Tatar Sepang	Lesser Sundas	Nusa Tenggara Barat	Sumbawa–Lombok	Sumbawa	14	67,860
238	IDN238	Taliwang	Lesser Sundas	Nusa Tenggara Barat	Sumbawa–Lombok	Sumbawa	19	5,348
239	*IDN239*	*Sumbawa Barat*	*Lesser Sundas*	*Nusa Tenggara Barat*			*0*	*5,460*
240	*IDN240*	*Pulau Panjang*	*Lesser Sundas*	*Nusa Tenggara Barat*			*Yes*	*10,645*
241	IDN241	Puncak Ngengas	Lesser Sundas	Nusa Tenggara Barat	Sumbawa–Lombok	Sumbawa	1	73,833
242	IDN242	Dodo Jaranpusang	Lesser Sundas	Nusa Tenggara Barat	Sumbawa–Lombok	Sumbawa	0	90,487

No.	Code	KBA name	Bioregion	Province/ municipality	Corridor	KBA cluster	% protected	Area (ha)
243	*IDN243*	*Perairan Pulau Moyo*	*Lesser Sundas*	*Nusa Tenggara Barat*			*Yes*	*7,659*
244	IDN244	Pulau Moyo	Lesser Sundas	Nusa Tenggara Barat	Sumbawa–Lombok	Sumbawa	96	29,055
245	*IDN245*	*Perairan Pulau Satonda*	*Lesser Sundas*	*Nusa Tenggara Barat*			*Yes*	*717*
246	IDN246	Gunung Tambora	Lesser Sundas	Nusa Tenggara Barat	Sumbawa–Lombok	Sumbawa	52	103,156
247	*IDN247*	*Nisa–Teluk Saleh*	*Lesser Sundas*	*Nusa Tenggara Barat*			*0*	*1,251*
248	IDN248	Empang	Lesser Sundas	Nusa Tenggara Barat	Sumbawa–Lombok	Sumbawa	0	41,085
249	*IDN249*	*Perairan Empang*	*Lesser Sundas*	*Nusa Tenggara Barat*			*0*	*14,886*
250	*IDN250*	*Perairan Parado*	*Lesser Sundas*	*Nusa Tenggara Barat*			*0*	*3,954*
251	*IDN251*	*Teluk Waworada*	*Lesser Sundas*	*Nusa Tenggara Barat*	*Komodo–Selat Sumba*		*0*	*34,681*
252	*IDN252*	*Perairan Bajo*	*Lesser Sundas*	*Nusa Tenggara Barat*	*Komodo–Selat Sumba*		*0*	*176*
253	*IDN253*	*Pulau Ular*	*Lesser Sundas*	*Nusa Tenggara Barat*	*Komodo–Selat Sumba*		*0*	*855*
254	*IDN254*	*Sangiang*	*Lesser Sundas*	*Nusa Tenggara Barat*	*Komodo–Selat Sumba*		*0*	*9,157*
255	*IDN255*	*Gili Banta*	*Lesser Sundas*	*Nusa Tenggara Barat*	*Komodo–Selat Sumba*		*Yes*	*4,054*
256	*IDN256*	*Pero*	*Lesser Sundas*	*Nusa Tenggara Timur*	*Laut Sawu*		*0*	*2,973*
257	**IDN257**	**Rokoraka–Matalombu**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Sumba**	**Sumba**	**0**	**3,416**
258	**IDN258**	**Cambaka**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Sumba**	**Sumba**	**0**	**836**
259	**IDN259**	**Danggamangu**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Sumba**	**Sumba**	**0**	**500**
260	**IDN260**	**Yawila**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Sumba**	**Sumba**	**0**	**3,980**
261	**IDN261**	**Lamboya**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Sumba**	**Sumba**	**0**	**1,747**

No.	Code	KBA name	Bioregion	Province/ municipality	Corridor	KBA cluster	% protected	Area (ha)
262	**IDN262**	**Poronumbu**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Sumba**	**Sumba**	**0**	**1,778**
263	IDN263	Pantai Mananga Aba–Pantai Waeketo	Lesser Sundas	Nusa Tenggara Timur	Laut Sawu		0	7,391
264	**IDN264**	**Kaliasin**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Sumba**	**Sumba**	**0**	**191**
265	**IDN265**	**Lokusobak**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Sumba**	**Sumba**	**0**	**2,907**
266	**IDN266**	**Baliledo**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Sumba**	**Sumba**	**0**	**810**
267	**IDN267**	**Pahudu Tilu**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Sumba**	**Sumba**	**0**	**526**
268	**IDN268**	**Manupeu Tanadaru**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Sumba**	**Sumba**	**90**	**50,647**
269	*IDN269*	*Tangairi–Lukulisi–Konda Maloba*	*Lesser Sundas*	*Nusa Tenggara Timur*	*Laut Sawu*		*0*	*8,625*
270	*IDN270*	*Perairan Tarimbang*	*Lesser Sundas*	*Nusa Tenggara Timur*	*Laut Sawu*		*0*	*3,462*
271	**IDN271**	**Tarimbang**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Sumba**	**Sumba**	**0**	**12,378**
272	**IDN272**	**Lai Kayambi**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Sumba**	**Sumba**	**0**	**6,465**
273	**IDN273**	**Praipaha Mandahu**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Sumba**	**Sumba**	**0**	**2,158**
274	**IDN274**	**Yumbu–Kandara**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Sumba**	**Sumba**	**0**	**7,861**
275	**IDN275**	**Laiwanggi Wanggameti**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Sumba**	**Sumba**	**76**	**49,096**
276	IDN276	Pulau Salura–Mangkudu–Kotak	Lesser Sundas	Nusa Tenggara Timur	Laut Sawu		Partial	4,799
277	**IDN277**	**Tanjung Ngunju**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Sumba**	**Sumba**	**0**	**14,410**
278	*IDN278*	*Perairan Tanjung Ngunju*	*Lesser Sundas*	*Nusa Tenggara Timur*	*Laut Sawu*		*Partial*	*6,145*
279	**IDN279**	**Luku Melolo**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Sumba**	**Sumba**	**0**	**5,595**
280	**IDN280**	**Komodo–Rinca**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Coast**	**Flores**	**98**	**60,767**

No.	Code	KBA name	Bioregion	Province/ municipality	Corridor	KBA cluster	% protected	Area (ha)
281	IDN281	Perairan Komodo–Rinca	Lesser Sundas	Nusa Tenggara Timur	Komodo–Selat Sumba		Yes	121,456
282	**IDN282**	**Wae Wuul**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Coast**	**Flores**	**27**	**4,451**
283	**IDN283**	**Nggorang Bowosie**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Coast**	**Flores**	**0**	**13,633**
284	**IDN284**	**Mbeliling–Tanjung Kerita Mese**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Forest**	**Flores**	**0**	**32,894**
285	**IDN285**	**Sesok**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Forest**	**Flores**	**0**	**6,436**
286	**IDN286**	**Nangalili**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Coast**	**Flores**	**0**	**430**
287	**IDN287**	**Todo Repok**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Forest**	**Flores**	**0**	**16,206**
288	**IDN288**	**Ruteng**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Forest**	**Flores**	**74**	**39,957**
289	**IDN289**	**Gapong**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Forest**	**Flores**	**0**	**14,674**
290	**IDN290**	**Pota**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Coast**	**Flores**	**0**	**708**
291	**IDN291**	**Nangarawa**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Forest**	**Flores**	**0**	**10,666**
292	**IDN292**	**Gunung Inerie**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Forest**	**Flores**	**47**	**11,503**
293	**IDN293**	**Aegela**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Forest**	**Flores**	**0**	**4,019**
294	**IDN294**	**Wolo Tado**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Coast**	**Flores**	**54**	**9,158**
295	IDN295	Riung 17 Pulau	Lesser Sundas	Nusa Tenggara Timur			Yes	22,797
296	**IDN296**	**Pulau Ontoloe**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Coast**	**Flores**	**100**	**377**
297	**IDN297**	**Mausambi**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Coast**	**Flores**	**27**	**3,478**
298	**IDN298**	**Kelimutu**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Forest**	**Flores**	**86**	**6,245**
299	*IDN299*	*Paga*	*Lesser Sundas*	*Nusa Tenggara Timur*			*0*	*3,871*

No.	Code	KBA name	Bioregion	Province/ municipality	Corridor	KBA cluster	% protected	Area (ha)
300	**IDN300**	**Tanjung Watu Mana**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Coast**	**Flores**	**0**	**431**
301	*IDN301*	*Gunungsari*	*Lesser Sundas*	*Nusa Tenggara Timur*			*0*	*649*
302	IDN302	Teluk Maumere	Lesser Sundas	Nusa Tenggara Timur			Yes	47,044
303	**IDN303**	**Pulau Besar**	**Lesser Sundas**	**Nusa Tenggara Timur**		**Flores**	**100**	**5,321**
304	**IDN304**	**Egon Ilimedo**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Forest; Flores Coast**	**Flores**	**7**	**27,388**
305	**IDN305**	**Ili Wengot**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Forest**	**Flores**	**0**	**4,061**
306	**IDN306**	**Gunung Lewotobi**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Forest**	**Flores**	**0**	**9,725**
307	***IDN307***	***Pantai Selatan Lebau***	***Lesser Sundas***	***Nusa Tenggara Timur***	***Solor–Alor***		***0***	***1,692***
308	**IDN308**	**Larantuka**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Forest**	**Flores**	**0**	**2,363**
309	**IDN309**	**Tanjung Watupayung**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Forest**	**Flores**	**0**	**7,139**
310	***IDN310***	***Flores Timur***	***Lesser Sundas***	***Nusa Tenggara Timur***	***Solor–Alor***		***0***	***3,034***
311	**IDN311**	**Perairan Lembata**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Solor–Alor**		**0**	**37,278**
312	**IDN312**	**Lamalera**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Forest**	**Flores**	**0**	**5,861**
313	**IDN313**	**Lembata**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Forest**	**Flores**	**0**	**30,467**
314	**IDN314**	**Selat Pantar**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Solor–Alor**		**Partial**	**54,425**
315	**IDN315**	**Pantar**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Forest**	**Flores**	**0**	**14,134**
316	***IDN316***	***Pantar Utara***	***Lesser Sundas***	***Nusa Tenggara Timur***	***Solor–Alor***		***Partial***	***3,281***
317	**IDN317**	**Gunung Muna**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Forest**	**Flores**	**0**	**9,525**
318	**IDN318**	**Perairan Gunung Muna**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Solor–Alor**		**Partial**	**3,539**

No.	Code	KBA name	Bioregion	Province/ municipality	Corridor	KBA cluster	% protected	Area (ha)
319	**IDN319**	**Mainang**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Forest**	**Flores**	**0**	**7,240**
320	***IDN320***	***Perairan Alor Utara***	***Lesser Sundas***	***Nusa Tenggara Timur***	***Solor–Alor***		***Partial***	***5,363***
321	**IDN321**	**Tuti Adagae**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Forest**	**Flores**	**51**	**24,278**
322	**IDN322**	**Kunggwera**	**Lesser Sundas**	**Nusa Tenggara Timur**	**Flores Forest**	**Flores**	**0**	**8,773**
323	IDN323	Pulau Redong	Lesser Sundas	Nusa Tenggara Timur			0	364
324	IDN324	Gunung Arnau	Lesser Sundas	Nusa Tenggara Timur	Timor–Wetar		68	67,186
325	IDN325	Danau Tihu	Lesser Sundas	Nusa Tenggara Timur	Timor–Wetar		0	8,778
326	*IDN326*	*Kepulauan Kisar*	*Maluku*	*Maluku*	*Busur Banda Dalam*		*0*	*338,955*
327	IDN327	Pulau Romang	Maluku	Maluku		Letti	0	17,221
328	IDN328	Perairan Kepulauan Lemola	Maluku	Maluku	Busur Banda Luar		0	133,775
329	IDN329	Kepulauan Lemola	Maluku	Maluku		Letti	0	57,764
330	*IDN330*	*Kepulauan Sermatang*	*Maluku*	*Maluku*	*Busur Banda Luar*		*0*	*199,471*
331	*IDN331*	*Kepulauan Damar*	*Maluku*	*Maluku*	*Busur Banda Dalam*		*0*	*133,075*
332	IDN332	Pulau Damar	Maluku	Maluku		Letti	0	19,748
333	*IDN333*	*Kepulauan Babar*	*Maluku*	*Maluku*	*Busur Banda Luar*		*0*	*308,386*
334	IDN334	Pulau Babar	Maluku	Maluku		Letti	0	62,505
335	IDN335	Perairan Angwarmase	Maluku	Maluku	Busur Banda Luar		0	1,634
336	IDN336	Tanimbar Tengah	Maluku	Maluku		Tanimbar	51	119,076
337	IDN337	Selat Yamdena	Maluku	Maluku	Busur Banda Luar		0	39,087
338	IDN338	Pulau Larat	Maluku	Maluku		Tanimbar	18	22,431
339	IDN339	Kepulauan Larat–Fordata	Maluku	Maluku	Busur Banda Luar		0	60,114
340	IDN340	Kateri–Maubesi	Lesser Sundas	Nusa Tenggara Timur	Timor–Wetar	Timor	67	14,881

No.	Code	KBA name	Bioregion	Province/ municipality	Corridor	KBA cluster	% protected	Area (ha)
341	IDN341	Gunung Mutis	Lesser Sundas	Nusa Tenggara Timur	Timor–Wetar	Timor	28	52,494
342	IDN342	Buat–Soe	Lesser Sundas	Nusa Tenggara Timur	Timor–Wetar	Timor	0	10,625
343	IDN343	Oenasi	Lesser Sundas	Nusa Tenggara Timur	Timor–Wetar	Timor	0	13,201
344	IDN344	Manipo	Lesser Sundas	Nusa Tenggara Timur	Timor–Wetar	Timor	49	14,624
345	IDN345	Camplong	Lesser Sundas	Nusa Tenggara Timur	Timor–Wetar	Timor	6	12,618
346	IDN346	Gunung Timau	Lesser Sundas	Nusa Tenggara Timur	Timor–Wetar	Timor	0	35,896
347	IDN347	Bipolo	Lesser Sundas	Nusa Tenggara Timur	Timor–Wetar	Timor	Yes	422
348	IDN348	Perairan Teluk Kupang	Lesser Sundas	Nusa Tenggara Timur	Laut Sawu		Partial	78,477
349	IDN349	Teluk Kupang	Lesser Sundas	Nusa Tenggara Timur	Timor–Wetar	Timor	3	15,274
350	IDN350	Semau	Lesser Sundas	Nusa Tenggara Timur	Timor–Wetar	Timor	10	4,464
351	IDN351	Perairan Rote Utara	Lesser Sundas	Nusa Tenggara Timur	Laut Sawu		Partial	25,397
352	IDN352	Rote Utara	Lesser Sundas	Nusa Tenggara Timur	Timor–Wetar	Timor	9	20,699
353	IDN353	Danau Peto	Lesser Sundas	Nusa Tenggara Timur	Timor–Wetar	Timor	0	944
354	IDN354	Rote Barat Daya	Lesser Sundas	Nusa Tenggara Timur	Laut Sawu		Partial	53,153
355	*IDN355*	*Perairan Pulau Dana*	*Lesser Sundas*	*Nusa Tenggara Timur*	*Laut Sawu*		*Partial*	*34,527*
356	IDN356	Pulau Dana	Lesser Sundas	Nusa Tenggara Timur			0	3,878
357	**IDN357**	**Malili**	**Sulawesi**	**Sulawesi Selatan**		**Malili**	0	**18278**
358	IDN358	Nanggala	Sulawesi	Sulawesi Selatan	C. Sulawesi	Latimojong-Mambuliling	0	16,715
359	IDN359	Pulau Tagulandang	Sulawesi	Sulawesi Utara			0	5,260
360	**IDN360**	**Danau Tiu**	**Sulawesi**	**Sulawesi Tengah**		**Malili**	0	**1,090**
361	IDN361	Tolinggula	Sulawesi	Gorontalo	N. Sulawesi	Toli-Toli	0	1,938

No.	Code	KBA name	Bioregion	Province/ municipality	Corridor	KBA cluster	% protected	Area (ha)
362	IDN362	Lakaan Mandeu	Lesser Sundas	Nusa Tenggara Timur	Timor–Wetar	Timor	0	4,229
363	**IDN363**	**Gunung Hek**	**Sulawesi**	**Sulawesi Tengah**	**C. Sulawesi**	**Sulawesi Timur**	0	**5,550**
364	TLS001	Nino Konis Santana	Lesser Sundas	Lautem	Timor–Wetar	Timor	Yes	67,677
365	TLS002	Perairan Nino Konis Santana	Lesser Sundas	Lautem	Perairan Timor Leste		Yes	60,476
366	TLS003	Nari	Lesser Sundas	Lautem	Timor–Wetar	Timor	0	3,098
367	TLS004	Raumoco	Lesser Sundas	Lautem	Perairan Timor Leste		0	2,081
368	TLS005	Legumau	Lesser Sundas	Baucau, Lautem	Timor–Wetar	Timor	Partial	10,036
369	TLS006	Monte Matebian	Lesser Sundas	Baucau	Timor–Wetar	Timor	Yes	10,341
370	TLS007	Irabere–Iliomar	Lesser Sundas	Viqueque, Lautem	Timor–Wetar	Timor	Partial	16,500
371	*TLS008*	*Perairan Irabere–Iliomar*	*Lesser Sundas*	*Viqueque, Lautem*	*Perairan Timor Leste*		*0*	*2,573*
372	TLS009	Monte Builo	Lesser Sundas	Viqueque	Timor–Wetar	Timor	100	6,987
373	TLS010	Mundo Perdido	Lesser Sundas	Baucau, Viqueque	Timor–Wetar	Timor	100	25,945
374	TLS011	Kaibada	Lesser Sundas	Baucau	Perairan Timor Leste		0	578
375	TLS012	Perairan Subaun	Lesser Sundas	Dili, Manatuto	Perairan Timor Leste		0	10,618
376	TLS013	Subaun-Monte Kuri	Lesser Sundas	Dili, Manatuto	Timor–Wetar	Timor	Partial	23,579
377	TLS014	Laleia	Lesser Sundas	Manatuto	Timor–Wetar	Timor	0	8,818
378	TLS015	Monte Aitana–Bibileo	Lesser Sundas	Viqueque	Timor–Wetar	Timor	Partial	10,027
379	TLS016	Monte Diatuto	Lesser Sundas	Manatuto, Manufahi, Aileu	Timor–Wetar	Timor	Partial	37,468
380	TLS017	Monte Mak Fahik–Sarim	Lesser Sundas	Manatuto	Timor–Wetar	Timor	Partial	2,948
381	TLS018	Sungai Klere	Lesser Sundas	Manufahi, Manatuto	Timor–Wetar	Timor	Partial	42,066

No.	Code	KBA name	Bioregion	Province/ municipality	Corridor	KBA cluster	% protected	Area (ha)
382	*TLS019*	*Perairan Sungai Klere*	*Lesser Sundas*	*Manufahi, Manatuto*	*Perairan Timor Leste*		*0*	*31,715*
383	TLS020	Monte Tatamailau	Lesser Sundas	Ainaro, Aileu, Ermera	Timor–Wetar	Timor	Yes	30,215
384	TLS021	Leimia Kraik	Lesser Sundas	Ermera	Timor–Wetar	Timor	0	2,847
385	TLS022	Areia Branca no Dolok Oan	Lesser Sundas	Dili	Timor–Wetar	Timor	Yes	2,979
386	TLS023	Perairan Areia Branca no Dolok Oan	Lesser Sundas	Dili	Perairan Timor Leste		0	2,369
387	TLS024	Atauro Island	Lesser Sundas	Dili	Timor–Wetar	Timor	Yes	14,046
388	TLS025	Perairan Atauro	Lesser Sundas	Dili	Perairan Timor Leste		0	10,370
389	TLS026	Perairan Tasitolu	Lesser Sundas	Dili	Perairan Timor Leste		0	1,191
390	TLS027	Tasitolu	Lesser Sundas	Dili	Timor–Wetar	Timor	Partial	1,532
391	TLS028	Fatumasin	Lesser Sundas	Liquica, Ermera	Timor–Wetar	Timor	Yes	13,542
392	TLS029	Maubara	Lesser Sundas	Liquica	Timor–Wetar	Timor	Partial	5,263
393	*TLS030*	*Perairan Maubara*	*Lesser Sundas*	*Liquica*	*Perairan Timor Leste*		*0*	*3,698*
394	*TLS031*	*Perairan Be Malae*	*Lesser Sundas*	*Bobonara*	*Perairan Timor Leste*		*0*	*2,868*
395	TLS032	Be Malae	Lesser Sundas	Bobonara	Timor–Wetar	Timor	Partial	27,682
396	TLS033	Tilomar	Lesser Sundas	Covalima	Timor–Wetar	Timor	Yes	5,308
397	*TLS034*	*Perairan Tilomar*	*Lesser Sundas*	*Covalima*	*Perairan Timor Leste*		*0*	*1,188*
398	TLS035	Citrana	Lesser Sundas	Oecussi	Timor–Wetar	Timor	Partial	10,844

Notes on this table

1. Column headed "Percent Protected." When shown as a numeric value, this is the size of protected areas in relation to the size of the KBA. When shown as "yes," "no," or "partial," this means that an exact value could not be calculated. "Yes" reflects that 90 percent or more of

the KBA is formally protected, "no" means that 10 percent or less of the KBA is formally protected and "partial" means that between 10 and 90 percent of the KBA is formally protected.

2. Bold type indicates a priority KBA, per Chapter 13.
3. Blue highlighting indicates a marine KBA.
4. Italic type indicates a "candidate" KBA, as opposed to a confirmed site that meets the KBA standard.

APPENDIX 3. PROTECTED AREAS IN TIMOR-LESTE NOT RECOGNIZED AS KBAS

No.	Protected area name	Bioregion	Municipality	Corridor	KBA Cluster
1	Monte Manoleo	Lesser Sundas	Oecussi	Timur	Timor-Leste
2	Monte Taroman	Lesser Sundas	Covalima	Timur	Timor-Leste
3	Monte Burabo	Lesser Sundas	Viqueque	Timur	Timor-Leste
4	Parque Nacional KXG	Lesser Sundas	Ainaro, Same	Timur	Timor-Leste
5	Monte Laretame	Lesser Sundas	Viqueque, Baucau	Timur	Timor-Leste
6	Monte Talobu/Laumeta	Lesser Sundas	Ainaro	Timur	Timor-Leste
7	Monte Cutete	Lesser Sundas	Oecussi	Timur	Timor-Leste
8	Monte Tapo/Saburai	Lesser Sundas	Bobonara, Ermera	Timur	Timor-Leste
9	Monte Loelaku	Lesser Sundas	Bobonara	Timur	Timor-Leste
10	Monte Manucoco	Lesser Sundas	Dili	Timur	Timor-Leste
11	Ek Oni	Lesser Sundas	Oecussi	Timur	Timor-Leste
12	Maurei Lake	Lesser Sundas	Lautem, Viqueque	Perairan Timor-Leste	
13	Oebatan	Lesser Sundas	Oecussi	Timur	Timor-Leste
14	UsMetan	Lesser Sundas	Oecussi	Timur	Timor-Leste
15	Hasan Foun and Onu Bot Lake	Lesser Sundas	Covalima	Perairan Timor-Leste	
16	Aubion Lake	Lesser Sundas	Manatuto	Perairan Timor-Leste	
17	Aubion Mangrove Forest	Lesser Sundas	Manatuto	Perairan Timor-Leste	
18	Beko Lake	Lesser Sundas	Covalima	Perairan Timor-Leste	
19	Beko Mangrove Forest	Lesser Sundas	Covalima	Perairan Timor-Leste	
20	Welenas Lake	Lesser Sundas	Manufahi	Perairan Timor-Leste	
21	Aubion Lake	Lesser Sundas	Manatuto	Timur	Timor-Leste
22	Beko Lake	Lesser Sundas	Covalima	Timur	Timor-Leste
23	Bikan Tidi Lake	Lesser Sundas	Ainaro	Timur	Timor-Leste
24	Samik Saron	Lesser Sundas	Manatuto	Perairan Timor-Leste	
25	Floresta Alahfalun	Lesser Sundas	Lautem	Timur	Timor-Leste
26	Hera-metinaro Mangroves	Lesser Sundas	Dili	Timur	Timor-Leste
27	Iralalaru Lake	Lesser Sundas	Lautem	Timur	Timor-Leste
28	Korluli	Lesser Sundas	Bobonaro	Timur	Timor-Leste

No.	Protected area name	Bioregion	Municipality	Corridor	KBA Cluster
29	Maurei Lake	Lesser Sundas	Lautem, Viqueque	Timur	Timor-Leste
30	Modo Mahut Lake	Lesser Sundas	Manufahi	Timur	Timor-Leste
31	Monte Lakus/Sabi	Lesser Sundas	Bobonaro	Timur	Timor-Leste
32	Monte Mindelo	Lesser Sundas	Manufahi	Timur	Timor-Leste
33	Monte Oebatan	Lesser Sundas	Oecussi	Timur	Timor-Leste

Note: Blue highlighting indicates a marine protected area.

APPENDIX 4. CORRIDORS OUTCOMES IN WALLACEA

CT.	Corridor Name	Province	Area (ha)	KBAs	Notes
1	Barat Sulawesi Tengah	Sulawesi Barat, Sulawesi Utara	2,319,590	IDN059, IDN063, IDN065, IDN068	
2	Bentang Laut Banda	Maluku	1,930,038	IDN217, IDN224	
3	**Bentang Laut Buru**	**Maluku**	**2,213,436**	**IDN191, IDN197, IDN198, IDN206, IDN208, IDN209**	
4	Bentang Laut Lucipara	Maluku	1,930,038	IDN225	
5	Busur Banda Dalam	Maluku	2,580,733	IDN326, IDN331	
6	Busur Banda Luar	Maluku	5,973,386	IDN216, IDN219, IDN221, IDN326, IDN328, IDN330, IDN333, IDN335, IDN337, IDN339	
7	Central Sulawesi	Sulawesi Barat, Sulawesi Tengah, Sulawesi Selatan, Sulawesi Tenggara	6,243,989	IDN064, IDN066, IDN067, IDN069, IDN071, IDN072, IDN073, IDN074, IDN075, IDN076, IDN080, IDN086, IDN095, IDN096, IDN097, IDN098, IDN101, IDN103, IDN104, IDN106, IDN108, IDN110, IDN111, IDN126, IDN127, IDN129, IDN358, IDN363	Significant forest corridors remain in the region. Ridge to reef potential limited. Catchment management is critical for the conservation of the lake KBAs in Sulawesi Tengah. The Lore Lindu catchment provdes water to Palu and other urban centers.
8	Flores Coast	Nusa Tenggara Timur	179,880	IDN280, IDN282, IDN283, IDN284, IDN286, IDN290, IDN294, IDN296, IDN297, IDN300	Connectivity for Komodo populations may depend on near-shore marine habitats as well as coastal forests and savannas. Coastal forests play an important role in limiting sedimentation of reefs.
9	Flores Forests	Nusa Tenggara Timur	685,928	IDN284, IDN285, IDN287, IDN288, IDN289, IDN291, IDN292, IDN293, IDN298, IDN304, IDN305, IDN306, IDN308, IDN309, IDN312, IDN313, IDN315, IDN317, IDN319, IDN321, IDN322	Endemic species are dependent on a number of patches of forest, mostly in the uplands. Mbeliling and Ruteng KBAs protect highland that provides water to the main towns in western Flores.

CT.	Corridor Name	Province	Area (ha)	KBAs	Notes
10	Halmahera	Maluku Utara	691,328	IDN149, IDN150, IDN153, IDN154, IDN156, IDN158, IDN160, IDN161, IDN165, IDN167, IDN171, IDN172, IDN173, IDN174, IDN177, IDN178, IDN179	Important forest corridors remain between KBAs in central and north Halmahera. Opportunities for ridge-to-reef links exist on the smaller islands and some part of Halmahera island. Aketajawe KBA protects watersheds near the provincial capital, Sofifi. If plans for Nickel processing plants go ahead the supply of water for these will also become important.
11	Halmahera [marine]	Maluku Utara	5,396,683	IDN146, DN148, IDN151, IDN152, IDN155, IDN157, IDN159, IDN162, IDN166, IDN168, IDN169, IDN175, IDN176, IDN180, IDN181, IDN187, IDN189, IDN190	
12	Kepulauan Sula	Maluku	1,435,607	IDN090, IDN094	
13	Komodo–Selat Sumba	Nusa Tenggara Timur	754,100	IDN251, IDN252, IDN253, IDN254, IDN255, IDN281	
14	Laut Sawu	Nusa Tenggara Timur	2,540,129	IDN256, IDN263, IDN269, IDN270, IDN276, IDN278, IDN348, IDN351, IDN354, IDN355	
15	Laut Sulawesi	Sulawesi Utara, Gorontalo	7,888,060	None	
16	Lombok-Sumbawa	Nusa Tenggara Barat	2,050,317	IDN228, IDN229, IDN230, IDN232, IDN233, IDN236, IDN239, IDN240, IDN243, IDN245, IDN247, IDN249, IDN250	
17	North Sulawesi	Sulawesi Utara, Gorontalo	3,516,330	IDN019, IDN022, IDN025, IDN027, IDN028, IDN029, IDN030, IDN031, IDN034, IDN035, IDN036	
18	Palung Timor	Timor-Leste	912,028	None	
19	**Pangkajene Kepulauan**	**Sulawesi Selatan**	**2,640,576**	**None**	
20	Perairan Timor Leste	Timor-Leste	544,149	TLS002, TLS004, TLS008, TLS011, TLS012, TLS019, TLS023, TLS025, TLS026, TLS030, TLS031, TLS034	
21	Selat Makasar	Sulawesi Barat	14,144,548	None	
22	Seram-Buru	Maluku	1,427,848	IDN192, IDN193, IDN194, IDN195, IDN196, IDN199, IDN200, IDN201, IDN202, IDN203, IDN204, IDN205, IDN207, IDN210, IDN211, IDN212, IDN213, IDN214	Important forest corridors remain across Seram and Buru. Opportunities for ridge-to-reef links exist on the smaller islands and around the east of Seram

CT.	Corridor Name	Province	Area (ha)	KBAs	Notes
23	**Solor–Alor**	**Nusa Tenggara Timur**	**3,043,621**	**IDN307, IDN310, IDN311, IDN314, IDN316, IDN318, IDN320**	
24	South Sulawesi	Sulawesi Selatan	879,949	IDN130, IDN131, IDN133, IDN134, IDN135, IDN137, IDN138	Very little natural habitat remains outsite the KBAs. The KBAs are the source of water for significant irrigation areas and the city of Makassar.
25	**Sulawesi Selatan**	**Sulawesi Selatan**	**4,636,985**	**IDN132, IDN136, IDN139, IDN141, IDN142**	
26	**Sulawesi Tenggara**	**Sulawesi Tenggara**	**6,626,670**	**IDN105, IDN107, IDN112, IDN113, IDN117, IDN119, IDN121, IDN122, IDN125**	
27	**Sulawesi Utara**	**Sulawesi Utara**	**6,006,005**	**IDN001, IDN002, IDN006, IDN008, IDN009, IDN013, IDN014, IDN016, IDN017, IDN018, IDN020, IDN023, IDN026, IDN032, IDN033, IDN361**	
28	Sumba	Nusa Tenggara Timur	662,795	IDN257, IDN258, IDN259, IDN260, IDN261, IDN262, IDN264, IDN265, IDN266, IDN267, IDN268, IDN271, IDN272, IDN273, IDN274, IDN275, IDN277, IDN279	The forest KBAs are within a mosaic of savanna woodland and dryland agriculture. Connectivity between patches is vital for populations of larger frugivorous birds. Forest may play a role in local micro-climate and rainfall. Laiwangi-wangameti protects water catchments that supply the island's economic capital, Waingapu
29	Sumbawa-Lombok	Nusa Tenggara Barat	475,605	IDN227, IDN231, IDN234, IDN235, IDN237, IDN238, IDN241, IDN242, IDN244, IDN246, IDN248	Limited role for connectivity between KBAs, most forest patches already included. Rinjani and uplands in Sumbawa provide water.

CT.	Corridor Name	Province	Area (ha)	KBAs	Notes
30	Timor-Wetar	Nusa Tenggara Barat, Timor-Leste	1,902,524	IDN324, IDN325, IDN340, IDN341, IDN342, IDN343, IDN344, IDN345, IDN346, IDN347, IDN349, IDN350, IDN352, IDN353, IDN362, TLS001, TLS003, TLS005, TLS006, TLS007, TLS009, TLS010, TLS013, TLS014, TLS015, TLS016, TLS017, TLS018, TLS020, TLS021, TLS022, TLS024, TLS027, TLS028, TLS029, TLS032, TLS033, TLS035	Connectivity between forest patches through Timor Island is important for frugivorous birds, deer. While ridge-to-reef connections have been broken by coastal development in most areas, forests play an important role limiting run-off and sedimentation onto the area's coral reefs. Gunung Mutis/Timau, and the mountains of central Wetar and central Timor-Leste all play a critical role in maintaining soils and water supplies, including for Dili and Kupang. Forest plays a role in local micro-climates.
31	**Togean-Banggai**	**Sulawesi Tengah**	**1,909,669**	**IDN077, IDN079, IDN081, IDN087**	

Notes on this table

1. **Bold type** indicates a priority marine corridor, per Chapter 13.
2. Rows marked in blue highlight indicate marine corridors.
3. Rows with no highlighting indicate terrestrial corridors.

CEPF is a joint initiative of l'Agence Française de Développement, Conservation International, the European Union, Fondation Hans Wilsdorf, the Global Environment Facility, the Government of Canada, the Government of Japan and the World Bank. A fundamental goal is to ensure civil society is engaged in biodiversity conservation.

Offices located at:
Conservation International
2011 Crystal Drive, Suite 600
Arlington, VA 22202 USA
www.cepf.net

CRITICAL ECOSYSTEM PARTNERSHIP FUND

Protecting Biodiversity by Supporting People