CRITICAL ECOSYSTEM PARTNERSHIP FUND

Ecosystem Profile

Wallacea Biodiversity Hotspot

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State Secretariat for Environment	Andre Soares
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State Secretariat for Environment	Clementino T.B.
State Secretariat for Forests and Conservation	Manuel Mendes
Timor Gap	Rony D.C.
Timor Gap	Leonel Hornai
Timor Gap	Recardina P.
Timor Gap	Madelena R.
Tmap	David Craven
UNAER	Alberto Martins
UNDP	Ilivio Xavier
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Village Head	Antonio Martins
World Bank	Luis Constantino
World Vision	Sergenet Tessem
WorleyParsons	Chris Serjak

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ABOUT THE CRITICAL ECOSYSTEM PARTNERSHIP FUND

The Critical Ecosystem Partnership Fund (CEPF) empowers people to be good stewards of the planet, so they and future generations continue to benefit from its life-sustaining resources, such as clean air, fresh water, a stable climate and healthy soils. The Fund is a joint program of l'Agence Française de Développement, Conservation International, the European Union, the Global Environment Facility, the Government of Japan, the MacArthur Foundation and the World Bank. The partners believe that civil society is uniquely positioned to protect some of Earth's most biologically rich yet threatened ecosystems.

CEPF provides grants to nongovernmental and private sector organizations, communities and individuals so they can conserve these critical ecosystems, located in biodiversity hotspots. The investments are even more meaningful because these regions are home to millions of people who are impoverished and highly dependent on natural resources.

Enabling civil society groups to have stronger voices and exert greater influence in the world around them is the hallmark of our approach. Our grantee partners range from small farming cooperatives and community associations to private sector partners, and national and international nongovernmental organizations.

Our grants:

- Target biodiversity hotspots in developing and transitional countries, and address many of the "Aichi" targets—the 20 goals set by the countries that are parties to the Convention on Biological Diversity to guide global efforts to save biodiversity and improve human well-being through 2020.

- Are guided by regional investment strategies—ecosystem profiles—developed with local stakeholders.

- Go directly to civil society groups to build this vital constituency for conservation alongside governmental partners. Grants are awarded on a competitive basis to implement the conservation strategy developed in each ecosystem profile.

- Create working alliances among diverse groups, combining unique capacities and eliminating duplication of efforts.

- Achieve results through an ever-expanding network of partners working together toward shared goals.

To date, we have supported more than 1,800 civil society groups and individuals in more than 60 countries.

EXECUTIVE SUMMARY

Biodiversity and the threats to it are not distributed evenly over the face of the globe. Conservation organizations can maximize the effectiveness of their limited funds by focusing on the places that are most important and where action is most urgent. Thirty-five biodiversity hotspots, defined as regions that have at least 1,500 endemic plants species and have lost more than 70 percent of their natural habitat, have been identified globally. They cover only 2.3 percent of the Earth's surface but contain a disproportionately high number of species, many of which are threatened with extinction. Hotspots, therefore, are global priorities for conservation.

Wallacea is a hotspot in central Indonesia and Timor-Leste in Southeast Asia with a total land area of 33.8 million hectares. The region's thousands of islands support highly diverse biological communities with many unique species—more than half of the mammals, 40 percent of the birds and 65 percent of the amphibians found in Wallacea do not occur outside the hotspot. Many of these species are endemic not only to the hotspot but also to single islands or mountains within it. Such species are highly vulnerable to habitat loss, hunting, collection and other pressures. As a result, Wallacea has 308 terrestrial and freshwater species classified by the International Union for Conservation of Nature as globally threatened, and many more species for which data is inadequate to allow full assessment of their status.

Wallacea's marine habitats do not have as many endemic species as the terrestrial habitats, but along with neighboring New Guinea, the region has more marine species than anywhere else on the planet, and it forms the heart of the Coral Triangle. Of these marine species, 252 are classified as threatened with extinction by IUCN, many of them corals, which are vulnerable to the combined effects of bleaching, sedimentation and pollution as well as destructive fishing practices.

No location in Wallacea is further than 100 kilometers from the coast, and the fragmentation of the region into so many islands has had a defining influence on the social, political and economic landscapes. The majority of the region's 30 million people live in coastal areas, and many still derive their living from farms, forests and wetlands inland, as well as the sea; however, the region is changing rapidly. Makassar, a city of more than a million people, is the center of economic development in eastern Indonesia, and another four cities—Ambon, Manado, Mataram and Kupang—are nearing populations of 500,000. For centuries, these cities have been centers for the export of natural resources from Wallacea. Originally these were sandalwood, nutmeg and cloves, but now copra, coffee, minerals, timber and fish are the main exports.

Coastal and inland customary (traditional) communities have developed a variety of mechanisms for controlling and managing their natural resources. Local land and marine tenure rules, with limits on harvesting resources, remain strong, particularly in parts of Maluku, Timor-Leste and Nusa Tenggara. The nature of resource use, however, has been changed in ways that are beyond the control of local rules, by population growth, in-migration, and the government's allocation of land for the development of large-scale

plantations, logging and mining concessions. Although customary mechanisms have been weakened, formal mechanisms for the planning and enforcement of rules on the exploitation of natural resources have generally failed to deliver efficient or sustainable outcomes. Limited capacity, lack of political will, poor monitoring and conflicts between customary and formal resource management regimes have conspired to create a situation in which opportunistic, short-term and often illegal natural resource exploitation by companies and individuals predominates, with carefully planned and managed sustainable use the exception.

Despite these problems, national and local governments have recognized the importance of the region's natural resources and biodiversity. Indonesia has created 2.8 million hectares of official terrestrial protected areas in Wallacea (8 percent of the land area), and Timor-Leste has declared 12 protected areas and is in the process of creating a network of 50. Large stretches of marine protected areas have also been created, and there are ambitious plans for the expansion of the marine protected area network in Indonesia.

To increase the chance of success, it is important that actions supported by CEPF complement existing strategies and programs of national governments, donors and other stakeholders. To this end, before starting a grant-making program, CEPF works with local stakeholders to develop an ecosystem profile for the hotspot. The profile describes the important species and sites, as well as the threats, opportunities and actions that are already being taken for conservation in the region, enabling CEPF to identify priority sites, species and themes to support.

The ecosystem profile for Wallacea was developed between June 2013 and February 2014, through a process that involved the participation of more than 400 people representing 316 organizations. The profile lists 560 species in Wallacea that are classified by IUCN as globally threatened. For most species, the key to conservation is protection of adequate areas of appropriate habitat. The profile therefore identifies important sites, known as key biodiversity areas (KBAs), where these threatened species are known to survive. There were 251 terrestrial and 74 marine KBAs identified using records of the presence of globally threatened species, with an additional 66 candidate marine KBAs identified to cover important marine ecosystems believed to contain threatened species.

In some cases, the protection of discrete areas of habitat in a KBA may not ensure the survival of a species, especially where the species ranges widely over the landscape or occurs at a very low density. This is especially important for marine species that may move over large areas during their life cycles. To accommodate this, 16 marine and 10 terrestrial corridors were also identified. These large areas play a vital role in ensuring connectivity between KBAs. In doing so, they also play an important role in ecosystem functions important for human livelihoods, such as by protecting water supplies and preventing coastal erosion.

CEPF Niche and Investment Priorities

The identification of conservation outcomes in Chapter 4 of the ecosystem profile constitutes a long-term, overarching agenda for conservation of Wallacea's unique and valuable biodiversity. Only a fraction of these priorities can be tackled by civil society organizations over the next five years with CEPF support. The ecosystem profile therefore identifies CEPF's niche (Chapter 11); namely, **to support a diversity of civil society organizations with varying levels of capacity to achieve conservation outcomes and environmental sustainability within the increasingly important national agendas of economic growth.** Building from the niche, the profile identifies biogeographic and thematic priorities for support, summarized here and described in detail in Chapter 12.

Species outcomes: Of 560 globally threatened species, CEPF will support actions to address the conservation of 22 terrestrial and 207 marine species (including 176 corals) that require specific actions beyond site conservation because they are overharvested for trade and consumption or they are vulnerable to other threats.

Site and corridor outcomes: CEPF will support actions for the conservation of KBAs and corridors in eight priority areas:

- Terrestrial and marine KBAs in the North Sulawesi (Sangihe-Talaud) Islands.
- Lake Poso (Sulawesi).
- Central Sulawesi lakes.
- Terrestrial KBAs in South Sulawesi.
- Terrestrial and marine KBAs in Flores and the Solor–Alor island group.
- Terrestrial KBAs on Seram, Maluku.
- Terrestrial and marine KBAs on Halmahera and surrounding islands.
- Terrestrial and marine KBAs in Timor-Leste.

Thematically, CEPF's grant-making will be guided by seven strategic directions, broken down into 34 investment priorities, which are summarized here and described in detail in Chapter 12.

CEPF Strategic Directions	CEPF Investment Priorities
1. Actions to address specific 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
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
3. Support sustainable natural resource management by communities at 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
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

CEPF Strategic Directions	CEPF Investment Priorities
5. Engage the private sector as an active participant 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
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
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

1. INTRODUCTION

Biodiversity forms a key element of the environment that underpins human well-being, and its loss harms evolutionary potential. Despite recognition of this, such loss is accelerating globally (Butchart *et al.* 2010) as species-rich natural ecosystems are overexploited, mined or replaced by simple, artificial systems that are more effective at producing the food, energy and other needs of growing populations. This simplification and extinction of unique biodiversity diminishes human cultures, destroys livelihoods that have evolved, and contributes to the homogenization of cultures.

There are many reasons for this contradiction between acknowledging the value of biodiversity while allowing its destruction in pursuit of economic growth, but fundamentally it stems from the choices of individuals based on the range of options available to them. Conservation, therefore, is about changing people's perspectives and goals, so they make decisions that favor the maintenance of biodiversity and the sustainable use of resources.

Civil society organizations (CSOs) are in a unique position to influence people's choices because they are based within their communities. Unlike government, CSOs have no power to compel people to change, so they have learned to influence choices and behavior by combining education and incentives, and by helping people achieve their aspirations for development while taking a long-term perspective on the environment. Not surprisingly, many local communities possess knowledge and practices that are essentially pro-environment, and by working together on issues that are obstacles to their development, such as land rights or access to health and education services, they can simultaneously achieve conservation goals.

Biodiversity and the threats to it are not distributed evenly over the face of the globe. Conservation organizations can maximize the effectiveness of their limited funds by focusing on the places that are the most important and where action is most urgent. One of the most influential priority setting analyses was the identification of biodiversity hotspots (Myers *et al.* 2000, Mittermeier *et al.* 2004), defined as regions that have at least 1,500 endemic plants species and have lost at least 70 percent of their natural habitat. There are 34 hotspots globally, covering 15.7 percent of the earth's surface. The intact natural habitats within these hotspots cover only 2.3 percent of the world's surface, but contain half of all plants and 77 percent of all terrestrial vertebrates. There are four hotspots in Southeast Asia: Indo-Burma, the Philippines, Sundaland (Peninsula Malaysia, Borneo and Sumatra), and Wallacea.

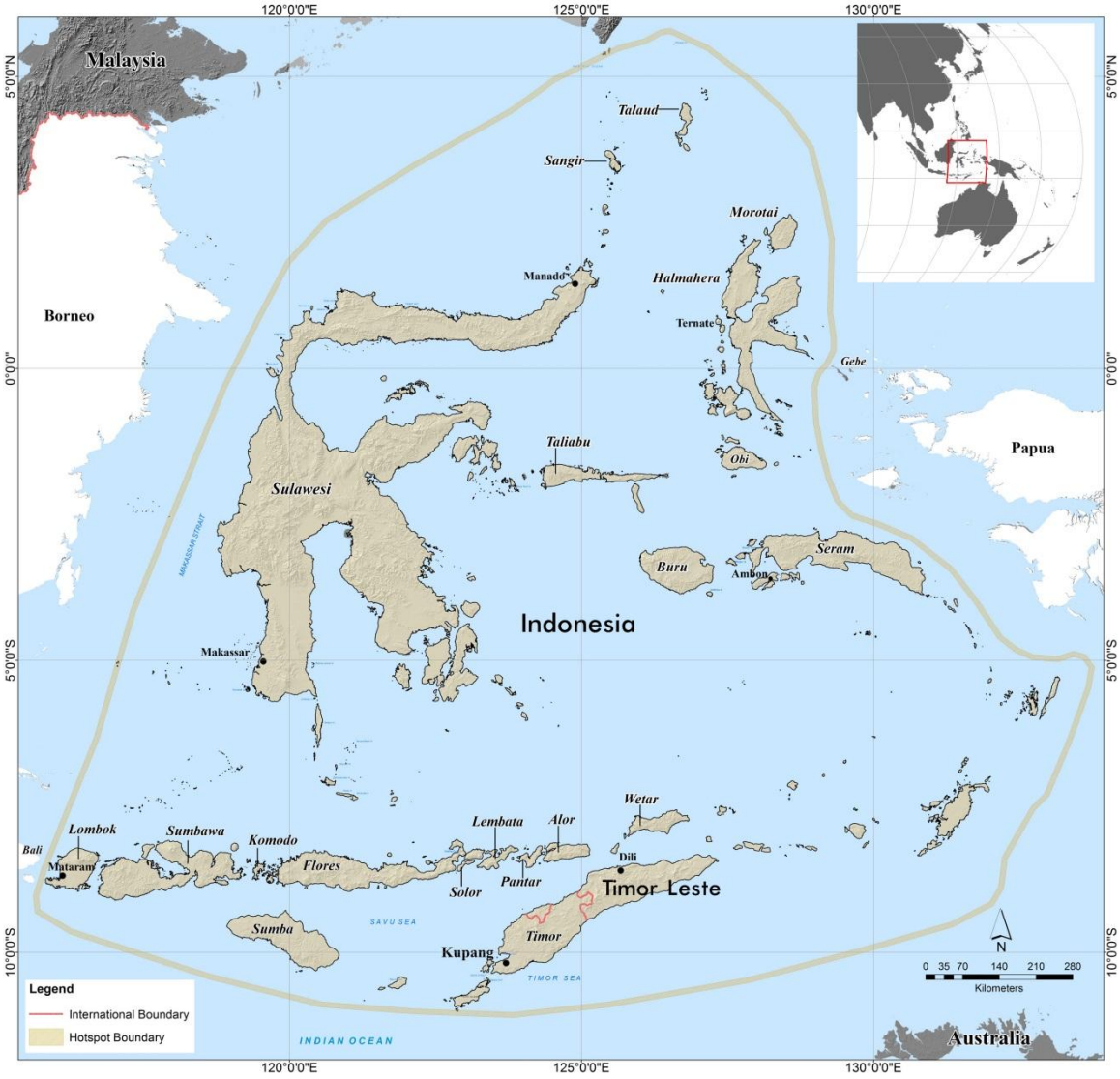
The majority of hotspots are in tropical countries that struggle with issues of poverty and human development, and where local conservation efforts suffer from the shortage of funds and support. The Critical Ecosystem Partnership Fund was established in 2000 to channel funding to civil society organizations in this subset of hotspots in developing countries. CEPF's goals are to support civil society to engage in action for the conservation of globally important biodiversity while building capacity and enhancing human livelihoods.

In 2013, the CEPF Donor Council selected the Wallacea Hotspot in Indonesia and Timor-Leste (Figure 1.1) as eligible for funding. Before launching any grants program, CEPF commissioned the preparation of this document, an ecosystem profile of the hotspot. The profile presents a snapshot of the current state of the hotspot, identifying priorities and opportunities for action. It was developed by compiling published information, consulting with experts, and engaging in discussions with governments, CSOs and local communities across the region. In all, more than 400 people contributed their time and knowledge over six months, July 2013–February 2014.

Chapters 3 and 4 of this report tell the story of the biodiversity, reviewing the extraordinarily unique and threatened ecosystems and species that are found here, and identifying "conservation outcomes"—priority actions—for species, sites and corridors. The next six chapters describe what is happening in the hotspot, focusing on socio-economic issues (Chapter 5), regulations and policies (Chapters 6), civil society (Chapter 7), threats to biodiversity (Chapter 8), and the potential impacts of climate change (Chapter 9). In the following chapters, Chapter 10 describes the existing investment in conservation efforts. Drawing on this picture of the current state of the hotspot, the pressures on biodiversity and the potential of civil society, Chapter 11 describes in general terms where CEPF will focus within the time frame and budget of the planned grants program. Chapter 12 expands on this, developing a detailed agenda for the grants program, including proposed priority species and sites for CEPF funding and a framework of strategic directions.

The most striking aspects of the eight workshops held across Wallacea during the ecosystem profile process were the enthusiasm and commitment of local stakeholders as they helped identify priority sites and species. Participants from communities, NGOs, local governments and the private sector view their biodiversity as an essential part of both their environment and their identities, and were unanimous that it needs to be sustained. The disconnect between this view and the current trajectory of resource exploitation and economic development in Wallacea is a reminder that the drivers of change are often beyond the immediate control of local stakeholders. At the same time, it reinforces the importance of the opportunity presented by the CEPF scheme to support and strengthen local initiatives for sustainable resource management, build networks for conservation across sectors, and assist local stakeholders in playing a greater role in determining the fate of their local biodiversity.

Figure 1.1. Map of the Wallacea Biodiversity Hotspot



2. BACKGROUND

This chapter describes the ecosystem profile process, including the compilation of the profile document and the stakeholder consultations.

The process was implemented by a consortium led by Burung Indonesia, a national conservation NGO, in partnership with the Bogor Agricultural University Center for Marine and Coastal Studies; the BirdLife International Secretariat (Cambridge, U.K.); the Samdhana Institute, a regional community empowerment NGO; and the Wildlife Conservation Society's Indonesia Program. Hametin Associates, a group of experts on social and environmental issues in Timor-Leste, provided input and facilitated implementation of the process in Timor-Leste.

The purpose of the ecosystem profile is to provide an overview of biodiversity conservation in Wallacea, an analysis of the priorities for action, and to strengthen the constituency for conservation in Wallacea. In doing so, it lays out a strategic framework for the implementation of CEPF's conservation grant-making program in Wallacea, which will run for at least five years from 2014; it also defines a broader conservation agenda in the region and aims to encourage more stakeholders to engage with and support this agenda. The data collation and consultation process started in June 2013, and was publicly launched at an event in Jakarta, Indonesia, on July 8, 2013. It ended when the second draft of the ecosystem profile document was discussed at workshops in Jakarta and Dili in January and February 2014.

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 of conservation concern, which principally means those 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 profile team reviewed existing analyses, in particular, that from the BirdLife International Important Bird Areas and Endemic Bird Areas analysis, and the IUCN Red List accounts for globally threatened species. They also reviewed published books, reports and papers describing species and habitats in Wallacea, as well as unpublished reports and information available on the Internet.

The preliminary list of sites identified for species of conservation concern was 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; the Royal Botanic Garden of Kew, U.K.; Conservation International; BirdLife International; and universities in Australia, the United States and elsewhere.

In addition to the knowledge of these specialists, the team sought the input of local governments, communities, businesses and civil society organizations in Wallacea. A total of 262 people participated in eight two-day workshops in Ternate, Manado, Ambon, Makassar, Mataram, Sumba, Kupang and Dili during August and September 2013 (Table 2.1). 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, and this information forms an important part of the analysis in chapters 7, 8 and 10. The lists of species and the maps of proposed priority sites —key biodiversity areas—were posted on a website (www.wallacea.org) and promoted through a Facebook page (www.facebook.com/ProfilEkosistemWallacea).

Table 2.1. Dates and Location of Local Stakeholder Consultations Workshops

Dates (All 2013)	Workshop Location	Province/Country Covered by Workshop	# Participants
Aug. 27–28	Kupang	East Nusa Tenggara (except Sumba)	28
Sept. 2–3	Anakalang, Sumba	Sumba (East Nusa Tenggara)	37
Sept. 2–3	Manado	North Sulawesi, Gorontalo, Central Sulawesi	42
Sept. 5–6	Ternate	North Maluku	24
Sept. 18–19	Ambon	Maluku	44
Sept. 18–19	Mataram	West Nusa Tenggara	26
Sept. 24–25	Makassar	Southeast Sulawesi, South Sulawesi	26
Sept. 24–25	Dili	Timor-Leste	35
		Total	262

Overall, 301 organizations and individuals not associated with any organizations participated in the ecosystem profile process. Table 2.2 summarizes the categories of participation.

Table 2.2. Summary of Organizations/Individuals Participating in the Ecosystem Profile Process

	Nationality of Organization			
	Indonesia	Timor-Leste	International	Total
CBO/NGO	112	15	9	136
Government (national and local)	79	6	0	85
Business and media	27	7	4	38
Donor/UN agency	0	0	9	9
University or researcher	22	1	10	33
Total	240	29	32	301

CEPF makes grants to civil society organizations, which are defined as organizations outside of government, including NGOs; community groups; academic institutions; and business, trade, social, political and religious mass-membership organizations. For CEPF, understanding the interests, capacity and needs of civil society in Wallacea is as important as understanding its biodiversity. Three members of the team, who are based in Indonesian Wallacea, Hametin in Timor-Leste, and Bogor, Indonesia, worked to collect information on CSOs. The workshops in the region provided an important opportunity to learn about civil society, and the second day of each workshop was devoted to discussions on the capacity and interest of the CSOs. Ninety-six CSOs completed a detailed questionnaire about their work and needs; their responses were used as input to Chapter 7.

Several international and national organizations are active in conservation in Wallacea, including some with extended experience working in the region. Recommendations from these organizations were captured during a meeting in Bogor, Indonesia, in October 2013 and through one-on-one meetings with key organizations throughout the process.

Although CEPF makes grants to civil society, government plays a critical role in conservation and is always a partner in its efforts. The Indonesian and Timor-Leste governments provided guidance for the overall process and to the conservation outcomes analysis through the participation of key agencies and ministries. In Burung Indonesia, representatives from these agencies were placed in National Advisory Committees (NACs) in each country. These committees met twice during the process and once at the end to discuss the final profile and the plans for the implementation of the CEPF program. Members of an NAC also included the national GEF focal point, representatives of the global donors to CEPF, and representatives of conservation, development, indigenous-peoples and private-sector organizations.

One of the important lessons 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 amateur observers. The ecosystem profile represents one of the first attempts to collate the 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 Bird Data Base, 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. BIOLOGICAL IMPORTANCE OF THE HOTSPOT

3.1 Geography

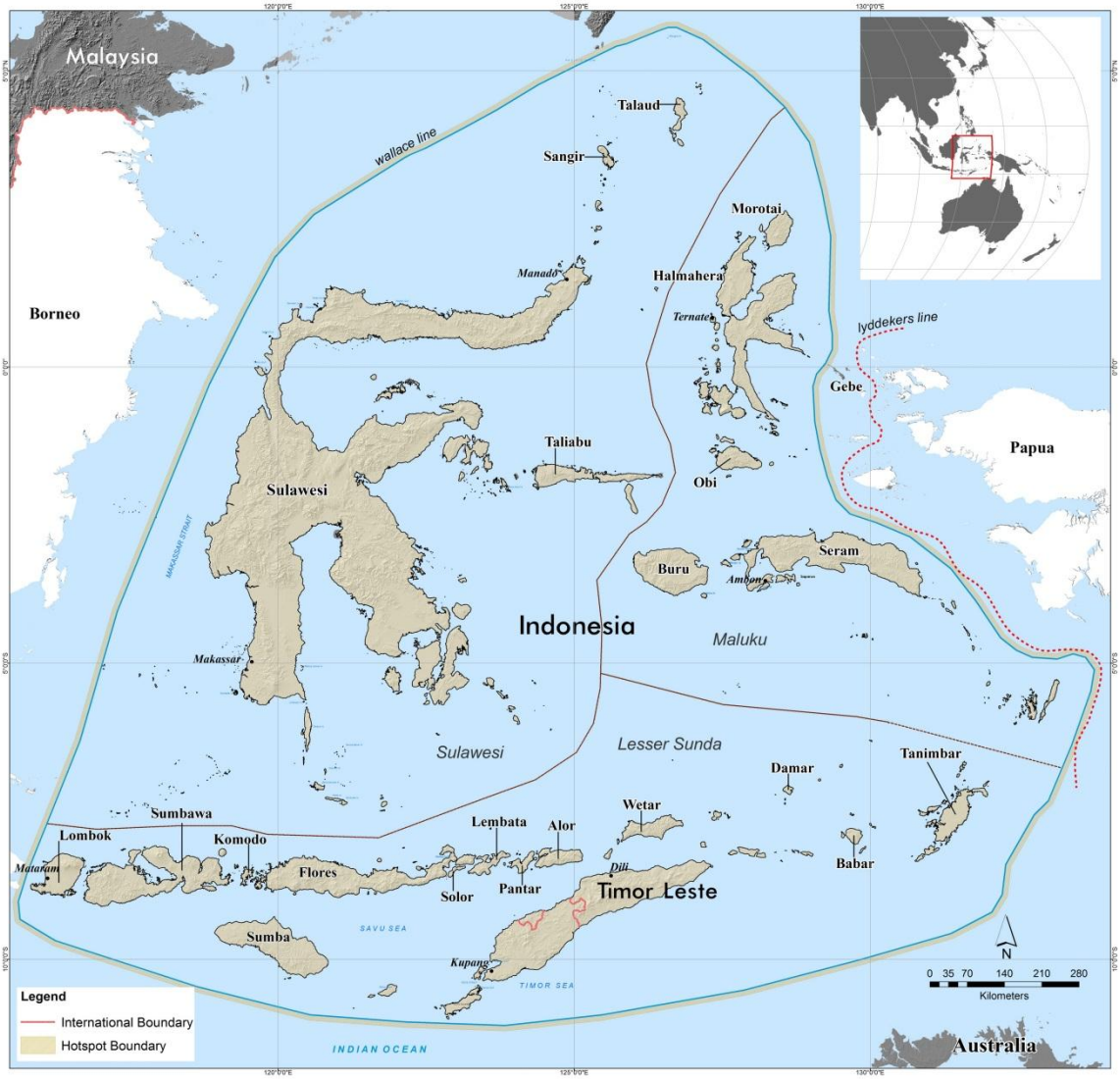
The Wallacea Hotspot is located in the islands of the Indonesian archipelago and Timor-Leste, between the Sunda and Sahul continental shelves (White and Bruce 1986). The region is named after Alfred Russel Wallace, who spent years collecting specimens of flora and fauna within the region (described in 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, runs between Borneo Sulawesi and Bali 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 nonflying 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 east of Maluku (Halmahera, Seram, Kai, 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 Conservation International's definition of the Wallacea Hotspot, using the Wallace and Lydekker lines (Figure 3.1). The hotspot corresponds to the whole of the Republic of Timor-Leste and the Indonesian Provinces of East Nusa Tenggara, West Nusa Tenggara, Maluku and North Maluku, 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 Wallacea.

Wallacea's line does not apply to marine species, as it cuts through the marine eco-regions where the archipelago is located; however, the region, along with 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 hectares, 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, Tanimbar, Banda and Kai, with a total land area of seven million hectares. In the Lesser Sundas subregion, the main islands are Lombok, Sumbawa, Sumba, Flores and Timor, totaling 8.1 million hectares. The largest land mass in the region is the island of Sulawesi, covering 18.6 million hectares, 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 Republic of Timor-Leste.

Figure 3.1. Wallacea and Biogeographic Subregions Used in the Ecosystem Profile



There are two areas of difference between administrative and biogeographic subregions: the Sula Islands (Mangole, Sanana, Taliabu and surrounding islands) are biogeographically part of the Sulawesi subregion but administratively in North Maluku Province; and the islands of the Banda Arc, Wetar, Romang, Lemola, Damar as far as Tanimbar are biogeographically part of the Lesser Sundas subregion but administratively in Maluku Province. Throughout this ecosystem profile, "subregion" refers to the biogeographic divisions.

3.2 Geology

The land area of Wallacea is fragmented into thousands of islands, most of them less than a million hectares. This characteristic has had a defining influence on the region's biodiversity and its social, political and economic landscape. The total number of islands is not known for certain, but one estimate is that there are 1,683 islands in Maluku and the Lesser Sundas, 84 percent of them less than one million hectares in area (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) include Sulawesi and most of the islands in north Maluku — 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 3.1.

- **Table 3.1. Summary of Geological Timescale and Events Related to Wallacea Region Over the Last 350 Million Years**
-

Era	Millions of Years Ago Ended	Geological Events	Biological Events
Cenozoic	0.01		Modern man, man'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 East Sulawesi collide with west Sulawesi; northern peninsula starts rotating; eastern and western Sulawesi begin to fuse; widespread volcanism in west 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).

3.3 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 500–1000 millimeters per year in the Lesser Sundas to 3500–4000 millimeters per year at the equator in North Sulawesi and Halmahera (Coates and Bishop 1997, Monk *et al.* 1997).

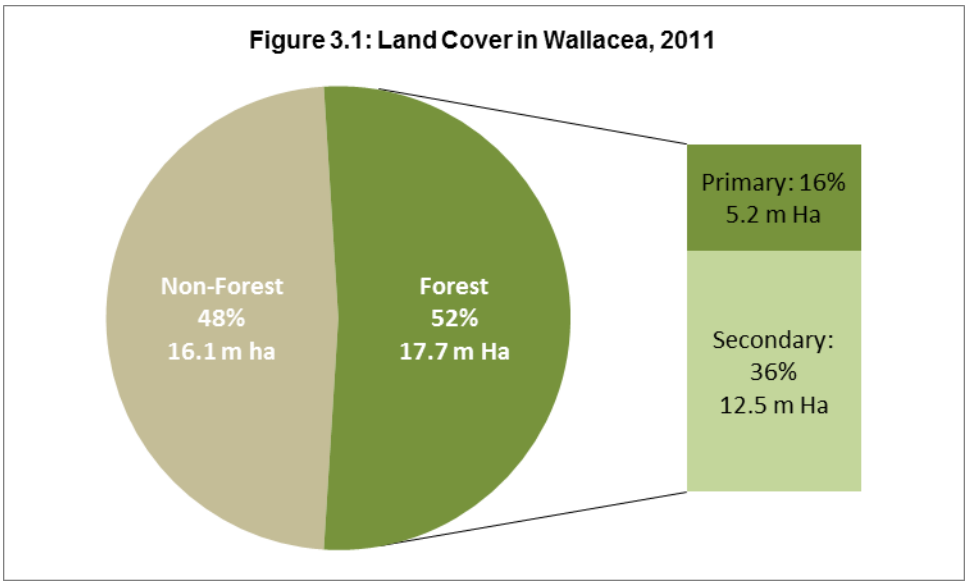
The daily temperature range throughout the year in this region is between 21°C and 34°C, with little seasonal variation, while the relative humidity is always high at dawn (above 90 percent) and reduces to 50 percent to 60 percent in the afternoon (Coates and Bishop 1997, Monk *et al.* 1997). The combination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

3.4 Habitats and Ecosystems

3.4.1 Forests

Forests covered 17.7 million hectares or just over half of the land surface of Wallacea in 2011 (FAO Global Forest Assessment figures, Ministry of Forestry figures for Indonesia). Almost a third of the forest was classified as “primary” by the Indonesian Ministry of Forestry, giving an estimated total of 5.2 million hectares of primary forest, close to Conservation International’s estimate that the remaining natural vegetation in the hotspot totals 5,077,400 hectares. Figure 3.1 shows the breakdown of land cover in Wallacea by hectares and as a percentage.



There are significant differences in forest cover across the region. Sulawesi has 56 percent of Wallacea's forests, Maluku 24 percent, and the Lesser Sundas 19 percent, of which Timor-Leste contributes 4 percent; however, Maluku is the most heavily forested subregion, with 63 percent of the land area forested, compared to 54 percent in Sulawesi and 41 percent in the Lesser Sundas. Timor-Leste is 50 percent forested, according to FAO Global Forest Assessment figures (2010), This data is subject to debate and the real figure may be much lower.

At a provincial level, Central Sulawesi stands out for its forest cover. The province has 4.5 million hectares of forest, and although it is the largest province in Wallacea, at 6.1 million hectares, this still amounts to an extraordinary 73 percent forest cover, meaning that this province alone has 26 percent of all Wallacea's forests. Three other provinces have more than 2 million hectares of forest: Southeast Sulawesi, North Maluku and Maluku. At the opposite extreme, North Sulawesi has the smallest area of forest (0.6 million hectares/3 percent of the Wallacea total), although the least forested province is actually South Sulawesi, which at 31 percent forest cover is lower than East or West Nusa Tenggara.

Patterns and rates of deforestation are discussed in more detail in Chapter 10 (Threats). The main types of forest occurring in Wallacea are described briefly below.

3.4.1.1 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 millimeters. Trees reach 30 meters 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 1987). *Enbonies Diospyros* species form dense clumps in some lowland forests and 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).

3.4.1.2 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, i.e., *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*. This forest type is now scarce in the Lesser Sundas but can be found in southeast Lombok and southwest 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.

3.4.1.3 Montane Forests and Montane Vegetation

Tropical montane forest is generally found above 900 meters. Tree species include conifers such as *Podocarpus*. Above about 2,400 meters, 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 (South Sulawesi) and Bogani-nani Wartabone National Park[1].

In the drier Lesser Sundas, the *Podocarpus* montane forests give way to *Casuarina* above 2,700 meters, and in the driest regions, such as in Timor-Leste, to black *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).

3.4.1.4 Other Forest Types

Heath forest or *kerangas* occurs on podzolic soils and has a low or medium canopy (10–30 meters), 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.

3.4.2 Karst (Limestone) Areas

Limestone erodes rapidly under heavy rain, producing steep cliffs, exposed rocks, karst phenomena and caves, especially in high-rainfall areas. 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

[1] WWF Lesser Sundas Deciduous Forests Ecoregion, http://worldwildlife.org/ecoregions/aa0201, accessed April 8, 2014.

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

3.4.3 Freshwater Rivers and Lakes

Nowhere in Wallacea is further than 100 kilometers 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 Southeast Sulawesi (11,407 hectares).

The Lesser Sundas and Maluku have relatively few lakes, most of them volcanic in origin, including Segera anakan (Lombok), Kelimutu (Flores), Satonda (Sumbawa). Sulawesi, in contrast, has 13 lakes over 500 hectares in area, including the second and third largest in Indonesia (Towuti and Poso), and the deepest in Southeast Asia (Matano, 590 meters) (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.

3.4.4 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 North Sulawesi. 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).

3.4.5 Seaweed and Seagrass Beds

Seagrasses are aquatic higher 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 fish, mollusks, green turtles and dugongs. They also stabilize offshore sand reservoirs, act as sediment collectors and prevent coastal erosion.

Indonesia has around 1.7 million hectares 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 hectares of seagrass concentrated in shallow coastal waters that are free from intense wave action or sedimentation.

3.4.6 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 species in the zones are usually *Avicennia* and *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).

3.4.7 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 meters deep. These deep-water 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 fish and whales.

3.5 Species Diversity, Endemism and Global Threat Status

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., Cassowary on Buru Island and Timor Deer), 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 vulnerable to extinction. Wallacea is home to 560 globally threatened species, 50 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.

Mammals: There are 222 species of terrestrial mammal in the Wallacea region, including rodent and bat species; 127 of them (57 percent) are endemic. These include charismatic big mammals found in Sulawesi such as Babirusa (*Babyrousa* sp., three species), and the lowland and mountain anoa (*Bubalus depressicorni* and *Bubalus quarlesi*). Sulawesi Island and its satellites are home to nine species of tarsiers (*Tarsius* sp.) and seven species of macaques (*Macaca* sp.).

Sixty-four of the terrestrial mammals are globally threatened. This list includes two species that are widespread outside the region, the Sunda Pangolin (*Manis javanica*) and Javan Langur (*Trachypithecus auratus*), and one that originates in the hotspot but has been widely introduced to other islands within and beyond Wallacea, Timor Deer (*Rusa timorensis*). Five species of bat are also found outside the hotspot, but the rest — 56 threatened mammal species — are all endemic to Wallacea and in 31 cases to a single island. Mammal distributions follow the division of Wallacea into subregions, with the threatened, endemic mammals all endemic to one of the subregions with one exception, the Babirusa (*Babyrousa babyrussa*), which occurs in Sulawesi and in Buru, Maluku. There are 40 threatened mammals in Sulawesi, 13 in Maluku and 15 in the Lesser Sundas. Five mammals are classified as critically endangered, four of them in the Sulawesi subregion (Talaud bear cuscus, *Ailurops melanotis; Lompobattang bunomys*; *Bunomys coelestis*; Celebes crested macaque, *Macaca nigra*; and the Siau Island tarsier,

Tarsius tumpara) and one in the Maluku subregion (Manusela melomys, *Melomys fraterculus*).

Five of the threatened mammals are marine. Important populations of sperm whale (*Physeter macrocephalus*) and blue whale (*Balaenoptera musculus*) breed in the region, and there are important populations of dugong (*Dugong dugon*), especially in the Lesser Sundas.

Birds: There are 711 bird species recorded in the Wallacea region, of which 274 (40 percent) are endemic; 61 of them are globally threatened, 49 of them are endemic to the hotspot, and the region is probably of significance for two more, the grey imperial pigeon (*Ducula pickeringii*) and the Christmas Island frigate bird (*Fregata andrewsi),* and perhaps also Abbott's booby (*Papasula abbotti*). Of the remaining nine threatened birds that have been recorded in Wallacea, two are rare migratory shorebirds, one has a feral breeding population, one has a small breeding population on the edge of its range outside Wallacea, and five are scarce nonbreeding visitors to the region. Of the endemics, 29 are found on just one island, with 23 threatened endemic birds in Sulawesi, 14 in Maluku, and 13 on the Lesser Sundas. Twelve bird species in Wallacea are classified as critically endangered. Seven of them are on only one island: three on Sangihe and one more on its neighbor, Siau; one on Peleng; all in Sulawesi, with two on the Maluku islands of Buru and Boano. Two other critical species are widespread in the Lesser Sundas — the yellow-crested cockatoo (*Cacatua sulphurea*), and the Flores hawk-eagle (*Nisaetus floris*).

There are 19 bird species classified as endangered. The Timor imperial pigeon (*Ducula cineracea*), Wetar ground-dove (*Gallicolumba hoedtii*), and Timor green-pigeon (*Treron psittaceus*) are restricted to the Lesser Sundas and found in Indonesia and Timor-Leste.

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 the Komodo Dragon (*Varanus komodoensis*) is the best-known and is found only in the Lesser Sundas islands of Komodo, Rinca and Flores. The most threatened reptile is probably the 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.

Ten species of reptiles in the Wallacea region are classified as globally threatened species, six of them endemic to the hotspot. Two species are critically endangered: the Rote Island snake-necked turtle (*Chelodina mccordi*), and the Sulawesi Forest turtle (*Leucocephalon yuwonoi*). Three species are endangered: the Banda Island dtella (*Gehyra barea*), the Sulawesian tortoise (*Indotestudo forstenii*), and the Flores blind snake (*Typhlops schmutzi*). Five species are vulnerable: the Asiatic softshell turtle (*Amyda cartilaginea*), the Southeast Asian box turtle (*Cuora amboinensis*), the king cobra (*Ophiophagus Hannah*), the Burmese python (*Python bivittatus*), and the Komodo dragon (*Varanus komodoensis*).

There are seven sea turtle species in the world, with five recorded in the Wallacea region. All of them are classified as globally threatened species. One of them, the hawksbill sea turtle (*Eretmochelys imbricata*), is classified as critically endangered. Two are endangered: the green sea turtle (*Chelonia mydas*) and the loggerhead sea turtle (*Caretta caretta*). Two are classified as vulnerable: the leatherback sea turtle (*Dermochelys coriacea*) and the Olive Ridley sea turtle (*Lepidochelys olivacea*).

Amphibians: There are 48 species of amphibians found in Wallacea, 33 (65 percent) of them are endemic. Eight frog species are listed as threatened species; all are endemic to Wallacea and five to Sulawesi. The four endangered species are the *Callulops kopsteini,* which is only found in Sanana Island, the Djikoro wart frog (*Limnonectes arathooni*) in three sites in South Sulawesi, the *Limnonectes microtympanum* in South Sulawesi (with an odd record from the Lambusango area in Southeast Sulawesi), and the Lombok cross frog (*Oreophryne monticola*). The vulnerable species are the Heinrich's wart frog (*Limnonectes heinrichi*), the Sulawesi cross frog (*Oreophryne celebensis*) from North Sulawesi (*Litoria rueppelli*) from North Maluku, and the *Oreophryne variabilis* from South Sulawesi and with an odd record from Lambusango. No endangered amphibians are found in the Lesser Sundas. Many more frog species await discovery or further study (D. Iskandar pers. comm 2013).

Fish: 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 the host to many freshwater fish species that are found only in lakes within the island, including all of the 37 threatened fish species within the Wallacea region. Among the threatened fish are four critically endangered species, three found only in Lake Poso (duckbilled buntingi, *Adrianichthys kruyti*; poso bungu, *Weberogobius amadi*; Popta's buntingi, *Xenopoecilus poptae*). The fourth, the dwarf pygmy goby, *Pandaka pygmaea*, is not known from any KBA but is believed to be distributed widely outside Wallacea.

There are four endangered freshwater fish species: *Nomorhamphus towoetii*, the sharp-jawed buntingi (*Oryzias orthognathus*) the egg-carrying buntingi (*Xenopoecilus oophorus*), and the Sarasins minnow (*Xenopoecilus sarasinorum*). The remaining 29 species are classified as vulnerable.

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.[2] Fifty-four marine fish are classified as globally threatened. Two are classified as critically endangered: the Pondicherry shark (*Carcharhinus hemiodon*) and the largetooth sawfish (*Pristis pristis*, previously *P. Microdon*). The endangered marine fish are the knifetooth sawfish (*Anoxypristis cuspidate*), the humphead wrasse (*Cheilinus undulates*), the flat-faced seahorse (*Hippocampus trimaculatus*), the longfin mako (*Isurus paucus*), the dwarf sawfish (*Pristis clavata*), and the scalloped hammerhead (*Sphyrna lewini*). The remaining

[2] http://newswatch.nationalgeographic.com/2013/12/11/countrys-first-new-species-of-fish-discovered/, accessed 28 Feb 2014

46 species, including charismatic species such as giant manta ray (*Manta birostris*), Coelacanth (*Latimeria menadoensis*) and whale shark (*Rhincodon typus*) are classified as vulnerable. The majority of them (42 species) are found in the Sulawesi subregion.

Vascular plant species: It is estimated that there are 10,000 plants in the Wallacea region. More than 15 percent of the species are endemic, and they are distributed throughout the Maluku, the Lesser Sundas, and Sulawesi subregions.

There are 66 globally threatened plant species in Wallacea. Forty-two of them are endemic to the hotspot, including three of the five critically endangered plants — the *Shorea montigena, Shorea selanica* and *Vatica flavovirens*. There are seven species categorized as endangered and 54 as vulnerable, including species of economic value such as sandalwood (*Santalum album*) and eaglewood (*Aquilaria cumingiana*), five species of the pitcher plant (*Nepenthes*) and the mangrove (*Avicennia rumphiana*).

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.

Nineteen species of butterflies and moths in Wallacea are globally threatened, all are endemic to the hotspot, 16 of them to single islands. The five endangered species are: Murphy's crow (*Euploea caespes*), Wallace's golden birdwing (*Ornithoptera croesus*), Kuekenthal's yellow tiger (*Parantica kuekenthali*), Bonthain tiger (*Parantica sulewattan*) and Timor yellow tiger (*Parantica timorica*). Records of these species are scarce, with no KBA identified for *P. timorica* or the *P. Philo*, which is classified as vulnerable.

There are seven species of dragonflies listed as globally threatened in the Wallacea region. All are endemic to single islands, three to a single site. Two are critically endangered, *Protosticta gracilis*, known only from the heavily developed region of Lake Tondano in North Sulawesi, and *Protosticta rozendalorum* from Sangihe. The endangered *Procordulia lompobatang* is known from Lompobatang in South Sulawesi and the vulnerable *Paragomphus tachyerges* from the Manupeu-Tanadaru National Park in Sumba.

Decapods (e.g., shrimps and crabs): The number of freshwater and marine decapods is unknown but undoubtedly large. Thirty-two decapods in the Wallacea region are classified as globally threatened. One species is identified as critically endangered, *Caridina linduensis*, recorded only from the Lake Lindu, while 15 species are classified as endangered and 16 species as vulnerable. All of these freshwater shrimps and crab species are found only in Sulawesi, five of them on the Maros-Pangkep karst ecosystem, 24 in Lake Poso and the Central Sulawesi Lakes, and two in a small area of North Sulawesi.

Calanoida (copepods): One species is on the Red List, classified as vulnerable, from this region: *Neodiaptomus lymphatus*, recorded only in Lake Tempe in Sulawesi.

Mollusks: Two species of freshwater gastropods in the Wallacea region are classified as globally threatened, *Tylomelania kruimeli* (critically endangered) from Lake Mahalona, and *Miratesta celebensis* (vulnerable) from Lake Poso. One threatened bivalve, *Corbicula possoensis* (endangered), is also from Lake Poso.

Two marine bivalves, both *Tridacna* spp. are classified as globally threatened: the giant clam (*Tridacna gigas*), and the southern giant clam (*Tridacna derasa*). Both of them are classified as vulnerable. Further data and information of these species is needed for updating their status.

Coral: There may be as many as 400 species of coral in Wallacea. Of these, 176 species are classified as globally threatened on the basis of their sensitivity to temperature change and susceptibility to bleaching (Carpenter *et al.* 2008). Nine of them are classified as endangered, and 167 as vulnerable. 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 Cucumber (echinoderms): Sea cucumbers are threatened by overharvesting to supply the large Asian food market for Beche-de-mer. Ten species in Wallacea are globally threatened and five are endangered—the golden sandfish (*Holothuria lessoni*), the *Holothuria scabra*, the black teatfish (*Holothuria nobilis*), the *Holothuria whitmaei*, and the prickly redfish (*Thelenota ananas)*. The vulnerable sea cucumber species are deep water redfish (*Actinopyga echinites*), the surf redfish (*Actinopyga mauritiana*), the blackfish (*Actinopyga miliaris*), the white teatfish (*Holothuria fuscogilva*) and the curryfish (*Stichopus herrmanni*). *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 3.2. Summary of Terrestrial Species Diversity and Endemism in Wallacea

Taxonomic Group	Total # of Species in Wallacea	# of Species Endemic to the Hotspot (percent)	# of Threatened Species in the Hotspot (percent)
Plants	10,000	>1,500 (15)	66 (1)
Mammals	222	127 (57)	64 (29)
Birds	711	274 (39)	61 (9)
Reptiles	222	99 (44)	10 (5)
Amphibians	48	33 (68)	8 (17)
Freshwater bishes	250	50 (20)	37 (15)
Birdwing butterflies	80	40 (50)	7 (9)
Coral	450	few	176 (39)

Sources: CI (2010); Burung Indonesia (2013).

4. CONSERVATION OUTCOMES DEFINED FOR THE HOTSPOT

The Wallacea Hotspot is not strictly a preserve, an area managed solely to maintain its biodiversity in a pristine state. The region is expected to provide livelihoods for almost 30 million people and to contribute to economic activities that are global in scope. 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. For most species, these changes mean loss of habitat and increased pressure from harvesting and hunting, which result in smaller, more fragmented, more vulnerable populations.

Even with unlimited resources, it would be impossible to maintain all the species and ecosystems in Wallacea in their present state. But resources are highly limited, so conservation has to compete for space with land uses that are more economically productive. Choices need to be made, therefore, about which sites, landscapes and species are the most important, feasible or urgent to conserve. CEPF refers to these priorities as "conservation outcomes," and this chapter describes the process and results of defining conservation outcomes for Wallacea.

These outcomes constitute a long-term agenda for Wallacea. With the time and funding available for its planned grant program, CEPF cannot address more than a small proportion of these priorities, so there is a second process to select those outcomes that are most important and appropriate to support through grant-making, which is the subject of chapters 11 and 12.

4.1 Methodology

CEPF defines conservation outcomes as "the entire set of conservation targets in a hotspot that needs to be achieved in order to prevent species extinctions and biodiversity loss." Conservation outcomes are defined in terms of species, and more specifically, species that are threatened with extinction globally. Action to address the threats may be focused on the species themselves (i.e., the fate of individual members of a population), on sites where a species lives in significant populations, or for some species, on larger landscapes or corridors used by the populations. Conservation outcomes are thus described for specific species at three levels — species, site and corridor. In practice, however, most globally threatened species have conservation outcomes defined for them at only one or two levels.

The first step in identifying conservation outcomes is the compilation of a list of species that are either globally threatened or of conservation concern in the hotspot. The global 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.[3] To compile a list of globally threatened species in Wallacea, data was downloaded from the IUCN Red List website (www.iucnredlist.org) for Indonesia and Timor-Leste. Then, for Indonesian species, the known range was examined to identify species believed to occur within the Wallacea hotspot boundaries. As new and revised assessments were uploaded, the list was rechecked during the ecosystem profile process. The final list used for this profile is data available on the IUCN Red List website on Nov. 1, 2013, and is contained in Annex 1.

Because the biggest threat to species globally is habitat loss and degradation, conservation action focuses on protecting and managing sites that still contain suitable habitat and viable populations. 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-based conservation 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 the species conservation. Some species, however, face threats, such as direct exploitation (harvesting or trapping) or competition with invasive species, that may not be overcome with the preservation of intact habitat in well-managed conservation areas alone. These species require the definition of species-level conservation outcomes, and the actions may include legal protection, investigation and enforcement to address smuggling, and public-awareness campaigns.

Species outcomes are the complete list of globally threatened species found in the hotspot. Most of the species on this list will be most effectively protected through protection of their habitat (i.e., through site and corridor outcomes); however, a subset is threatened by targeted exploitation for consumption, trade or other pressures that may not be addressed effectively through site protection. As a result, they need specific conservation actions that are identified and prioritized on the basis of their IUCN list status. Information on the threats comes from the IUCN Red List accounts, other literature, and information from taxonomic experts and stakeholders in the workshops run during profile development. The species listed in the annexes of the Convention on International Trade in Endangered Species (CITES) also provide a reference.

Species outcomes do not include species classified by IUCN as data deficient; however, "candidate species outcomes" were identified for those data-deficient species that, based on available information, are either rare or have a very limited range. The rationale for identifying these candidate species' outcomes is that further research to determine the species status is a priority.

Site outcomes are called key biodiversity areas (KBAs) by CEPF, and their definition is detailed in Langhammer *et al.* (2007).[4] In summary, a KBA is an area that, based on the best available data, is thought to contain a population of a globally threatened species, a

[3] Detailed definitions of these categories are avalable at www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria#definitions.

[4] Detailed methodology and discussion of assumptions and rationale for the selection of KBAs is available in Langhammer *et al.* (2007), available at http://data.iucn.org/dbtw-wpd/edocs/PAG-015.pdf.

globally significant proportion of the population of an endemic species or a species that is highly dependent on the conservation of the site. The criteria for selection of KBAs are summarized in Table 4.1.

Table 4.1. Criteria for the Definition of KBAs

Criterion	Subcriteria	Thresholds for Triggering KBA Status
Vulnerability: Regular occurrence of a globally threatened species at the site	None	Critically Endangered (CR) and Endangered (EN) species — presence of a single individual Vulnerable species (VU) — 30 individuals or 10 pairs
Irreplaceability: Site holds x% of a species' global population at any stage of the species' life cycle	Restricted-range species. Species with a global range less than 50,000 km^2	5% of global population at site
	Species with large but clumped distributions	5% of global population at site
	Globally significant congregations	1% of global population seasonally at the site
	Globally significant source populations	Site is responsible for maintaining 1% of global population
	Bioregionally restricted assemblages	To be defined

Source: Langhammer *et al.* (2007)

The starting point for the identification of **terrestrial KBAs** in Wallacea was the Important Bird Areas analysis carried out by BirdLife International and local partners in each country (Rombang *et al.* 2002, Trainor *et al.* 2007, Chan *et al.* 2004). This identification of IBAs used the same criteria as KBAs, but applied them only to bird species (the KBA identification process is based on the IBA concept). All IBAs defined for globally threatened bird species, or under irreplaceability criteria, i.e., restricted range species or globally significant congregations, automatically qualify as KBAs. We added to this initial list the set of sites identified by the Alliance for Zero Extinction (AZE), which identifies sites that hold a critically endangered or endangered single-site endemic species. AZE sites also automatically qualify as KBAs. Using locality records for non-bird globally threatened species, the coverage of other species in this preliminary set of KBAs was assessed and additional sites were identified for species, with special efforts made to identify additional sites for species covered by fewer than five sites on the initial list.

The identification of KBAs is dependent on the availability of locality records of the globally threatened or restricted-range species concerned. This poses a challenge because, by definition, many globally threatened species are little known and have few records. Range maps (e.g., on the IUCN Red List website) make assumptions about species ranges based on point localities and the extent of suitable habitat. The identification of KBAs, however, 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 when in fact it may not be.

Data sources for locality records were:

- IUCN Red List (IUCN 2013) and BirdLife International documentation, including the Important Bird Areas Directory 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 *The Ecology of Nusa Tenggara and Maluku* (Monk *et al*. 2003), *The Ecology of Sulawesi* (Whitten 1987), *Birds of Wallacea* (Coates and Bishop 1997), *Mammals of the South-West Pacific and the Moluccan Islands* (Flannery 1995).
- Online databases, such as FishBase (www.fishbase.org), and the databases of museums and botanic gardens, including the Royal Botanic Gardens, Kew, in the United Kingdom.
- Information from experts.
- Unpublished observations from field workers, amateur enthusiasts, and local people knowledgeable about specific sites, who participated in the eight regional workshops 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 Database of BirdLife International (www.birdlife.org), and the World Database on Protected Areas (www.wdpa.org).

KBAs are spatial units, so it is necessary to draw a polygon around the species' locality to define the KBA boundary. In a few cases, the large number of geo-located records made it possible to draw a polygon using the point localities. In most cases, however, only a single point was available, so polygons were drawn 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, existing protected areas boundaries were also used to define KBAs. However, where an ecological zone clearly had a different boundary from the protected area, the ecological boundary was given preference, as KBAs are intended to contain a specific conservation value and not be limited by administrative boundaries. Boundaries of IBAs and AZE sites, where they existed, were a starting point, but in many cases they were revised through this process. Many published site records refer to named places (e.g., national parks and mountains), but do not provide a geo-located 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 **biological prioritization** of KBAs uses a scoring system based on the concepts of vulnerability and irreplaceability (Langhammer *et al.* 2007). Terrestrial KBAs are categorized as extreme, high, medium or low for each of these factors following the criteria described in tables 4.2 and 4.3. Where a single KBA has several species with different vulnerability and irreplaceability scores, the highest one is used.

Table 4.2. Criteria Used to Assign Species-based Vulnerability Scores to Species–Site Pairs

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 4.3. Criteria Used to Assign Irreplaceability Score to Species–Site Pairs

Irreplaceability Score	Criteria if Population Data Is Available	Criteria if No Population Data Is Available
Extreme	Sites known or inferred to hold[3] 95% 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[3] 10% but <95% 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[3] 1% but <10% 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% 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 (a low number of sites causes a high irreplaceability score). 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 4.3. For species that are endemic to Wallacea, the adjusted KBA number is an estimate of the number of KBAs with suitable habitat for the species that occur within the species range in the hotspot. For species that are not endemic to Wallacea, the adjusted KBA number is based on an assumption about the likely number of sites globally where the species occurs, applying the relevant categories (2 to 10 sites, 11 to 100 sites, and more than 100 sites). Actual and adjusted KBA numbers are given in Appendix 1.

Complementarity analysis: As noted in the Conservation Outcomes section below, the biological prioritization method described above resulted in the identification of 24 highest priority KBAs, but did not satisfactorily distinguish between the rest. An alternative approach was therefore used to complement the biological prioritization, with

identification of the minimum network of sites needed to ensure that all globally threatened species in Wallacea are represented in at least one KBA. The analysis began with identifying the most unique site, defined as the one with the highest number of species found nowhere else. The second step was to select sites with the greatest number of species that are represented at only two sites, and so on, until all trigger species had been covered at least once. All sites with "single site" species automatically qualified under this analysis.

Marine site outcomes: For most globally threatened marine species, there is very little locality data available, because marine survey work has focused more on ecosystem monitoring. Data is especially scant for species that are difficult to identify; for example, more than half of the globally threatened marine species are corals that in some cases require laboratory examination to identify. For a minority of vulnerable marine species (e.g., the Napoleon wrasse, *Cheilinus undulatus*, and the 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. Overall, the marine species data allowed the identification of 74 marine KBAs on the basis of the presence of trigger species, but experts confirmed that this was clearly not representative of the distribution and richness of marine sites in the region.

To overcome this problem, a list of potential additional KBAs was generated from existing marine prioritization exercises. Several exercises have been carried out in recent years and form the basis of ambitious plans for expansion of the marine protected area network in Wallacea. These assessments use measures of ecosystem quality (coral cover and the presence of seagrass beds and mangroves) as the basis for identifying priority sites. Globally threatened marine species were classified according to their main habitat, and then information on species habitat and range was overlaid with the sites identified in the priority-setting exercises to generate a list of sites where the globally threatened species are likely to occur. Because these are not confirmed locality records, they are referred to as "hypothetical records" and the sites are known as "candidate KBAs." An additional 66 candidate marine KBAs were identified using this method.

Corridors are large landscape units defined for the purposes of maintaining ecological and evolutionary processes that species and sites depend on. They can be identified for specific species that rely on larger areas of habitat than can be conserved in a single KBA. These landscape species may range widely during their life cycle or daily search for food. (They are typically larger species or those dependent on food sources with seasonal and clumped distribution, such as frugivores.) Alternatively, they may be species that are not mobile but occur at very low densities, such that a viable population can be maintained only by conserving individuals of the population in a very large area. 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 are defined for landscape species and for the role of the corridor in maintaining ecosystem services and connectivity between KBAs. Landscape

species were identified by assessing globally threatened species within the hotspot based on their home range, feeding habits, and body size. Corridors 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 in almost all cases are forests. Corridors necessary for the maintenance of habitat connectivity and ecosystem services were identified by clusters of KBAs with similar habitats and species in a landscape matrix that shares some of their characteristics, and thus act as conduits for the exchange of individuals between populations. The functions of corridors in maintaining water catchments for areas of high-population density and agricultural productivity were also considered. In practice, there was a high degree of overlap between factors used for identifying corridors so that the major remaining forested landscapes on each of the main islands in Wallacea were identified as corridors.

Corridors were prioritized based on their biological importance using a complementarity approach — starting with the corridor with the highest number of landscape species, followed by the corridor that has the largest number of species not found in the first. Where corridors scored equally, preference was given to those with higher numbers of critically endangered and endangered-landscape species.

Marine corridors are defined as large areas that contain critical populations or processes (such as spawning sites or feeding concentrations) and were defined on the basis of consultations with experts. Identification of marine corridors helps to overcome some of the uncertainty associated with marine KBAs, noted above, because it allows the definition of large areas of marine habitat where specific sites are not adequately known and individual animals 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.

4.1.1 Methodological Limitations and Improving the Analysis

As noted above, species and site outcomes are defined using the IUCN's global standard criteria, which has the advantage of being a standard "currency" for categorizing the level of threat to a species. It does, however, have the following 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 trigger species and may not be covered by the conservation outcomes identified.
- 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 identification of KBAs based on locality data, not range maps, avoids the risk of conserving a site where a species is assumed to exist but may not. Doing so, however, risks missing important sites because data on distribution is often incomplete.
- 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 invalidates the approach, and 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 missed. The limitations do, however, suggest that this Ecosystem Profile should be viewed as a snapshot of Wallacea based on the available data in November 2013. The following actions are priorities for improving the effectiveness of the definition of conservation outcomes:

- 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 region, with special emphasis on (a) those species groups that have not yet been widely assessed, and (b) data-deficient species (see candidate species outcomes research in Section 4.2.1.1 and Table 4.9), which 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 a single to a few KBAs.
- Review the distribution of nonglobally 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 this to periodically re-evaluate the conservation outcomes.

4.2 Conservation Outcomes

4.2.1 Species Outcomes

Species outcomes consist of the list of globally threatened species found in the hotspot. As of Nov. 1, 2013, 560 species in Wallacea were classified as threatened with extinction by IUCN (critically endangered, endangered or vulnerable). Of these species, 308 are terrestrial or freshwater and 252 marine. The complete list of trigger species in Wallacea is in Annex 1.

Thirty-five species in Wallacea are classified as critically endangered by IUCN. Twenty-six of them are endemic to the hotspot, and of these, 13 are known only from one site (Table 4.4).

One critically endangered species, the Christmas Island frigatebird (*Fregata andrewsi*) breeds outside the hotspot and roams widely throughout the region as a nonbreeding visitor. Another, the marine hawksbill turtle (*Eretmochelys imbricata*), is recorded throughout the hotspot. There are no specific locality records for three others: the dwarf pygmy goby (*Pandaka pygmaea*), the pondicherry shark (*Carcharhinus hemiodon*) and the largetooth sawfish (*Pristis pristis*). None of these is endemic to the hotspot, and all

are expected to be distributed widely if scarcely across the region. Of the remaining 30 critically endangered species recorded in the hotspot, the Sulawesi subregion has 21, with one, the yellow-crested cockatoo (*Cacatua sulphurea*), shared with the Lesser Sundas, the tree *Shorea selanica* shared with Maluku, and the rest endemic to the subregion. In northern Sulawesi, seven critically endangered species are endemic to the islands of Siau, Sangihe and Salibabu (Talaud).[5] Another five are freshwater species endemic to lakes on Sulawesi — one each in Lake Tondano, Lake Lindu (Lore Lindu), Lake Mahalona and three in Lake Poso. Maluku has seven critically threatened species, including three single-island endemic birds on Seram, Boano and Buru, and two tree species that are endemic to Wallacea, one tree species that also occurs on New Guinea, and the Chinese crested tern (*Sterna bernsteini*), a very rare, nonbreeding visitor to the region. The Lesser Sundas has five critically endangered species: the yellow-crested cockatoo (*Cacatua sulphurea*) and the Flores hawk-eagle (*Nisaetus floris*) occur on several islands in the subregion; the freshwater snake-necked turtle (*Chelodina mccordi*) is known from only two sites on the small island of Rote, and Lake Iralaloro in Nino Konis Santana National Park, at the eastern end of Timor-Leste. The black-winged starling (*Sturnus melanopterus*) occurs in the Lesser Sundas in margin of the hotspot, on Lombok, and has its main distribution outside the region, while the tree *Hopea sangal* occurs in the Lesser Sundas and throughout Southeast Asia.

Table 4.4. Critically Endangered Species in Wallacea

Species Code	Scientific Name	Common Name	Red List Category	Wallacea Endemic	Single Site Endemic	# of KBAs	Range
52265	*Adrianichthys kruyti*	Duckbilled buntingi	CR	Yes	Yes	1	Endemic to Lake Poso, Central Sulawesi
109345	*Ailurops melanotis*	Talaud bear cuscus	CR	Yes	No	2	Endemic to Sangihe and Talaud islands, North Sulawesi
63340	*Bunomys coelestis*	Lompobattang bunomys	CR	Yes	Yes	1	Endemic to Karaeng — Lompobattang Mountains, South Sulawesi
1398	*Cacatua sulphurea*[*1]	Yellow-crested cockatoo	CR	Yes	No	88	All Lesser Sundas, Southeast and Central Sulawesi
60353	*Carcharhinus hemiodon*	Pondicherry shark	CR	No	No	0	Possibly throughout Wallacea
	Caridina linduensis		CR	Yes	Yes	1	Endemic to Lore Lindu Lake, Central Sulawesi
1375	*Charmosyna toxopei*	Blue-front lorikeet	CR	Yes	No	2	Endemic to Buru Island, Maluku
65659	*Chelodina mccordi*	Snake-necked turtle	CR	Yes	No	3	Rote, Nusa Tenggara and Timor-Leste
9816	*Colluricincla sanghirensis*	Sangihe shrike-thrush	CR	Yes	Yes	1	Endemic to Sangihe island, North Sulawesi
5764	*Corvus unicolor*	Banggai crow	CR	Yes	No	1	Endemic to the Peleng-Banggai Islands, Central Sulawesi

[5] Reviews of the taxonomy and Red List status of birds on Sangihe will increase the total number of critically endangered species on Sangihe from five to seven, and from seven to nine for this group of islands, with the addition of Sangihe dwarf kingfisher (*Ceyx sangirensis)* and Sangihe golden bulbul (*Thapsinillas platenae*) (N. Collar in litt., January 2014)

66265	*Eretmochelys imbricata*	Hawksbill sea turtle	CR	No	No	14	
6062	*Eutrichomyias rowleyi*	Caerulean Paradise-flycatcher	CR	Yes	No	2	Endemic to Sangihe Island, North Sulawesi
3847	*Fregata andrewsi*	Christmas Island frigatebird	CR	No	No	2	Scarce nonbreeding visitor throughout Wallacea
80574	*Hopea sangal*	Sangal	CR	No	No	3	Lesser Sundas and widely found in southeast Asia to the west of the Wallacea line
66238	*Leucocephalon yuwonoi*	Sulawesi forest turtle	CR	Yes	No	5	Central and North Sulawesi
63084	*Macaca nigra*	Celebes crested macaque	CR	Yes	No	8	Endemic to forests in North Sulawesi
80223	*Madhuca boerlageana*		CR	No	No	3	Maluku and New Guinea
64157	*Melomys fraterculus*	Manusela Melomys	CR	Yes	Yes	1	Endemic to Seram Island, Maluku
6107	*Monarcha boanensis*	Black-chinned monarch	CR	Yes	Yes	1	Endemic to Boano Island, Maluku
31547	*Nisaetus floris*	Flores Hawk-eagle	CR	Yes	No	14	Distributed widely in Lombok, Sumbawa, Flores
30061	*Otus siaoensis*	Siau scops-owl	CR	Yes	Yes	1	Endemic to Siau Island, North Sulawesi
53849	*Pandaka pygmaea*[*2]	Dwarf pygmy goby	CR	No	No	0	Recorded from Sulawesi only (site unknown), also Philippines
60712	*Pristis pristis*	Largetooth sawfish	CR	No	No	0	Possibly throughout Wallacea
111910	*Protosticta gracilis*	Minahasa damselfly	CR	Yes	Yes	1	Endemic to Lake Tondano, North Sulawesi
111313	*Protosticta rozendalorum*	Rozendaal's damselfly	CR	Yes	No	2	Endemic to Sangihe Island, North Sulawesi
78582	*Shorea montigena*		CR	Yes	No	5	Endemic to Maluku subregion
77120	*Shorea selanica*		CR	Yes	No	11	Maluku and Sulawesi bioregion
3264	*Sterna bernsteini*	Chinese Crested-tern	CR	No	No	1	Single record from Maluku
6821	*Sturnus melanopterus*	Black-winged starling	CR	No	No	1	
1014343	*Tarsius tumpara*	Siau Island Tarsier	CR	Yes	Yes	1	Endemic to Siau Island, North Sulawesi
	Tylomelania kruimeli		CR	Yes	Yes	1	Endemic to Lake Mahalona, South Sulawesi
78216	*Vatica flavovirens*		CR	Yes	No	6	Sulawesi (all)
53870	*Weberogobius amadi*	Poso Bungu	CR	Yes	Yes	1	Endemic to Lake Poso, Central Sulawesi
52273	*Xenopoecilus poptae*	Popta's Buntingi	CR	Endemic	Yes	1	Endemic to Lake Poso, Central Sulawesi
30062	*Zosterops nehrkorni*	Sangihe White-eye	CR	Yes	yes	1	Endemic to Sangihe island, North Sulawesi

*[1] The cockatoo is one of the few species that was probably over-recorded. It is well known by local people because it is valuable and distinctive. As a result it is reported from many KBAs, but in reality the number of KBAs with a significant population is much smaller, probably under 10.

*[2] No data was found to identify a KBA for the dwarf pygmy goby. Records of the species come from Indonesia and the Philippines, so it is assumed to occur at a large number of sites globally.

There are 108 species classified as endangered in Wallacea, of which 83 are terrestrial and 25 are marine. Marine species include three whales, two marine turtles and nine corals. Terrestrial species include 23 mammals, 20 birds, 15 shrimps and crabs, and seven plants. Of these, 77 are endemic to Wallacea, and 24 are known from only a single KBA.

Table 4.5. Numbers of Globally Threatened Species in Wallacea, and Totals per Region and Country

	IUCN Red List Status				Species Distribution by Bioregion			Species Distribution by Country	
Taxonomic Group	**CR**	**EN**	**VU**	**total**	**Sul**	**Mal**	**LS**	**IND**	**T-L**
Amphibians	0	4	4	8	6	1	1	8	0
Birds	12	20	29	61	29	16	20	61	6
Calanoida	0	0	1	1	1	0	0	1	0
Decapoda	1	15	16	32	32	0	0	32	0
Freshwater fish	4	4	29	37	37	0	0	37	0
Freshwater Gastropods and Bivalves	1	1	1	3	3	0	0	3	0
Lepidoptera	0	5	14	19	10	4	6	19	2
Mammals	5	23	36	64	40	13	15	64	2
Odonata	2	1	4	7	4	2	1	7	0
Plants	5	7	54	66	36	23	18	66	4
Reptiles	2	3	5	10	6	2	7	10	2
Corals	0	9	167	176	171	172	168	176	168
Marine fish	2	6	46	54	51	48	45	54	46
Marine mammals	0	3	2	5	5	5	5	5	5
Marine mollusk	0	0	2	2	2	2	2	2	2
Marine reptiles	1	2	2	5	5	5	5	5	5
Sea cucumbers	0	5	5	10	10	10	9	10	9
	35	**108**	**417**	**560**	**448**	**303**	**302**	**560**	**251**

Note: Some species occur in more than one region, and all of the species found in Timor-Leste also occur in Indonesia, which is why the sum of the totals is more than 560.

4.2.1.1 Priorities for Species Research

The lack of data on the range of globally threatened species was a major constraint in the identification and prioritization of KBAs. For six terrestrial globally threatened species, no data was found to support the identification of site outcomes in Wallacea (Table 4.8). It is likely that these species already occur in existing KBAs, but field work is needed to confirm this and thus ensure that the protection of these species is addressed. In addition, 143 species in Wallacea are defined by IUCN as data deficient. All of them require further work to clarify their status and distribution, but the 34 species listed in Table 4.9

are prioritized because available information suggests they are very rare or have a limited range. They are thus strong candidates to be assessed as globally threatened species once adequate data is available.

Table 4.8. Terrestrial Globally Threatened Species in Wallacea for Which No KBAs Could Be Identified

Scientific Name	English Name	Group	Red List Status	Distribution	Action Required
Euploea caespes	Murphy's crow	Lepidoptera	EN	Adonara, Sumba, Pura, East Nusa Tenggara	Surveys to locate sites for the species
Parantica philo	Sumbawa tiger	Lepidoptera	VU	Sumbawa, West Nusa Tenggara	Surveys to locate sites for the species
Parantica timorica	Timor yellow tiger	Lepidoptera	EN	Timor, East Nusa Tenggara and Timor-Leste	Surveys to locate sites for the species
Pandaka pygmaea	Dwarf pygmy goby	Fresh and marine water fish	CR	Indonesia, Philippines, Fiji, New Guinea	Clarification of distribution and reassessment of threat status
Rhinolophus canuti	Canoet's horseshoe-bat	Mammal	VU	Timor, East Nusa Tenggara and Timor-Leste	Single record from Timor may be a distinct form; requires further survey and clarification of taxonomy
Erythrina euodiphylla		Plant	VU	Timor, East Nusa Tenggara and Timor-Leste	Persistence of the species on Timor (single record in 1968) needs to be confirmed

Table 4.9. Candidate Species Outcomes for Data-Deficient Terrestrial Species Likely to Be Assessed as Globally Threatened

Scientific Name	Species Groups	Common Name	Site Island	**Notes** (1)
Rhacophorus edentulus	Amphibian	None	Sulawesi	Known only from holotype specimen.
Mycalesis tilmara	Lepidoptera	None	Sangihe, Siau	This species is endemic to the islands of Sangihe and Siau.
Crocidura tenuis	Mammal	Timor shrew	Timor	So far known, known from only two locations, but expected to occur more widely on the island, especially at higher elevations.
Crunomys celebensis	Mammal	Sulawesi shrew mouse	Sulawesi	Known from three specimens collected in the mid-1970s, captured accidentally. There has been limited survey work involving appropriate survey techniques.
Melomys cooperae	Mammal	Yamdena Island melomys	Yamdena	Known only from holotype specimen.
Prosciurillus abstrusus	Mammal	Secretive dwarf squirrel	Sulawesi	Known only from the type locality.
Rattus timorensis	Mammal	Timor forest rat	Timor	Known only from holotype specimen.
Rhinolophus montanus	Mammal	Timorese horseshoe bat	Timor	The species is known only from the holotype, collected in 1979.
Rousettus linduensis	Mammal	Linduan Rousette	Sulawesi	Known only from holotype specimen.

Scientific Name	Species Groups	Common Name	Site Island	Notes (1)
Tarsius lariang	Mammal	Lariang tarsier	Sulawesi	Recently described, population status cannot be reasonably estimated. Additional surveys are needed.
Tarsius pumillus	Mammal	Pygmy tarsier	Sulawesi	Known only from three museum specimen, and presumed to be extinct.
Tarsius wallacei	Mammal	Wallace's tarsier	Sulawesi	Recently described, population status cannot be reasonably estimated. Additional surveys are needed.
Argiolestes alfurus	Odonata	None	Bacan	Known only from the type-series of 20 males and one female: North Moluccas, Indonesia.
Celebophlebia dactylogastra	Odonata	None	Sulawesi	Known from three records from two localities.
Diplacina cyrene	Odonata	None	Buru	Known from two records from two localities.
Drepanosticta berlandi	Odonata	None	Lombok	Known from two records (prior to 1900).
Gynacantha arthuri	Odonata	None	Sumba	Known only from the male holotype and female para-type.
Huonia ferentina	Odonata	None	Halmahera	Known only from the holotype male.
Ictinogomphus celebensis	Odonata	None	Sulawesi	Known only from two records both prior to 1934.
Nannophlebia buruensis	Odonata	None	Buru	Known from three records prior to 1930.
Neurothemis nesaea	Odonata	None	Sulawesi	Known only from two males and one female.
Palaiargia optata	Odonata	None	Obi	Known only from two records prior to 1954.
Palaiargia tanysiptera	Odonata	None	Halmahera	Known from two localities and the type series.
Pseudagrion schmidtianum	Odonata	None	Timor	Known only from the type series.
Zygonyx ilia	Odonata	None	Sulawesi	Only known from the original description based on one male
Daemonorops schlechteri	Plant	None	Sulawesi	Known only form holotype specimen.
Drymophloeus oliviformis	Plant	None	Ambon	Confined to Ambon Island. The genus is in need of taxonomic revision.
Nephentes nigra	Plant	None	Sulawesi	Newly described species, no data on population.
Cyrtodactylus deveti	Reptile	Moluccan bow-fingered gecko	Morotai	Endemic to Morotai, Halmahera. Known only from a few specimens.
Cyrtodactylus gordongekkoi	Reptile	None	Lombok	Known only from two specimens from Lombok
Cyrtodactylus wetariensis	Reptile	Wetar bow-fingered gecko	Wetar	Known only from its type locality on Wetar Island
Enhydris matannensis	Reptile	Matano mud snake	Sulawesi, Muna	known from the type locality, Lake Matana, Sulawesi, and near Raha on Muna Island
Lepidodactylus oortii	Reptile	None	Banda, Damar, Yamdena	The habitat preferences of this species are unknown, but it is known to be arboreal and insectivorous.
Luperosaurus iskandari	Reptile	None	Sulawesi	Known only from the holotype specimen, collected in 1998 (Brown *et al.* 2000). Members of genus are rare and secretive.
(1) From IUCN Red List accounts, www.iucnredlist.org				

4.2.2 Site Outcomes

4.2.2.1. **Terrestrial** KBAs

An initial list of KBAs based on BirdLife International's Important Bird Areas analysis covers 126 IBAs (110 in Indonesia and 16 in Timor-Leste), of which 119 are identified for globally threatened bird species—five on small islands, identified for restricted-range bird species, and two for congregatory species (in this case, globally significant sea bird breeding colonies on remote islands). Sixteen Alliance for Zero Extinction sites (of which three are additional to the IBA list) were added to this initial list of KBAs, giving a total of 129 sites. Locality records for other globally threatened species were obtained from literature, stakeholder workshops, and expert consultations, and used to define new sites. The final list comprises 251 terrestrial KBAs, with 105 in the Lesser Sundas (82 in Nusa Tenggara and 23 in Timor-Leste), 95 in Sulawesi, and 51 in Maluku (Table 4.10). It is important to recognize that the identification of KBAs depends on the availability of site locality data for globally threatened species, and for some species, this is very limited. This analysis of conservation outcomes will need to be revised periodically as further data becomes available.

The 251 terrestrial KBAs in Wallacea cover 9.5 million hectares, about 30 percent of the 33.8 million hectare land surface. The average size of a terrestrial KBA is 37,892 hectares. Sulawesi has fewer, larger KBAs, so although the subregion has only 37 percent of all KBAs, they comprise 55 percent of the included area. Conversely, the Lesser Sundas have 42 percent of KBAs but only 22 percent of the area, with an average size of 20,000 hectares (Table 4.10).

Table 4.10. Summary of the Number of Key Biodiversity Areas in the Wallacea Hotspot, Divided According to Biogeographic Regions and by Country

	Terrestrial KBAs		**Marine KBAs + Candidate KBAs**		**Total KBAs**	
	Total	**Area (ha)**	**Total**	**Area (ha)**	**Total**	**Area (ha)**
Sulawesi	95	5,266,204	49	5,937,618	144	11,203,823
Maluku	51	2,146,217	31	1,560,713	82	3,706,929
Lesser Sundas	105	2,098,638	60	2,020,792	165	4,119,429
Total	**251**	**9,511,059**	**140**	**9,519,123**	**391**	**19,030,181**

Indonesia	228	9,131,438	128	9,389,572	356	18,521,010
Timor-Leste	23	379,621	12	129,551	35	509,171
Total	**251**	**9,511,059**	**140**			

Terrestrial KBAs were ranked on the basis of vulnerability and irreplaceability scores, following the methodology for biological prioritization of KBAs described in Section 4.1.

Using this approach, 24 KBAs emerge as the highest priority because they are scored extreme for both irreplaceability and vulnerability. Table 4.11 lists these high-priority KBAs, and Appendix 3 lists all KBAs with their scores.

Table 4.11. List of 24 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). (Within this category, sites with single-site endemic critically threatened species are listed first)

KBA Name, Province, and # of Globally Threatened Species	Summary of Species at the Site that Score: - Extreme for Vulnerability (Critically Endangered) - Extreme for Irreplaceability (Single-site Endemic)			Red List Status (Vulnerability)	Believed to Be Single-Site Endemic (Irreplace-ability)	AZE Site #
	Scientific Name	Common Name	Species Group			
Gunung Sahendaruman (North Sulawesi), 11	*Ailurops melanotis*	Talaud bear cuscus	Mammal	Critically endangered	No	IDN 18
	Colluricincla sanghirensis	Sangihe shrike-thrush	Bird	Critically endangered	Yes	
	Eutrichomyias rowleyi	Caerulean paradise-flycatcher	Bird	Critically endangered	No	
	Protosticta rozendalorum		Odonata	Critically endangered	No	
	Zosterops nehrkorni	Sangihe white-eye	Bird	Critically endangered	Yes	
Pulau Siau (North Sulawesi), 5	*Otus siaoensis*	Siau scops-owl	Bird	Critically endangered	Yes	IDN 25
	Tarsius tumpara	Siau Island tarsier	Mammal	Critically endangered	Yes	
Danau Mahalona (South Sulawesi), 14	*Tominanga aurea*		Freshwater fish	Vulnerable	Yes	
	Tylomelania kruimeli		Freshwater snail	Critically endangered	Yes	
Danau Poso (Central Sulawesi), 21	*Adrianichthys kruyti*	Duckbilled buntingi	Freshwater fish	Critically endangered	Yes	
	Cacatua sulphurea	Yellow-crested cockatoo	Bird	Critically endangered	No	
	Caridina acutirostris		Decapoda	Vulnerable	Yes	
	Caridina caerulea	Blue orph shrimp	Decapoda	Vulnerable	Yes	
	Caridina ensifera		Decapoda	Vulnerable	Yes	
	Caridina longidigita		Decapoda	Vulnerable	Yes	
	Caridina sarasinorum		Decapoda	Vulnerable	Yes	
	Caridina schenkeli		Decapoda	Vulnerable	Yes	
	Corbicula possoensis		Freshwater Bivalves	Endangered	Yes	
	Leucocephalon yuwonoi	Sulawesi forest turtle	Reptile	Critically endangered	No	
	Migmathelphusa olivacea		Decapoda	Endangered	Yes	
	Miratesta celebensis		Freshwater snail	Vulnerable	Yes	

KBA Name, Province, and # of Globally Threatened Species	Summary of Species at the Site that Score: - Extreme for Vulnerability (Critically Endangered) - Extreme for Irreplaceability (Single-site Endemic)			Red List Status (Vulnerability)	Believed to Be Single-Site Endemic (Irreplace-ability)	AZE Site #
	Scientific Name	Common Name	Species Group			
	Oryzias nigrimas	Black buntingi	Freshwater fish	Vulnerable	Yes	
	Oryzias orthognathus	Sharpjawed buntingi	Freshwater fish	Endangered	Yes	
	Parathelphusa possoensis		Decapoda	Vulnerable	Yes	
	Weberogobius amadi	Poso bungu	Freshwater fish	Critically endangered	Yes	
	Xenopoecilus oophorus	Egg-carrying buntingi	Freshwater fish	Endangered	Yes	
	Xenopoecilus poptae	Popta's buntingi	Freshwater fish	Critically endangered	Yes	
Danau Tondano (North Sulawesi), 4	*Protosticta gracilis*		Odonata	Critically endangered	Yes	
	Tondanichthys kottelati		Freshwater fish	Vulnerable	Yes	
Karaeng–Lompobattang (S Sulawesi), 19	*Bunomys coelestis*	Lompobattang bunomys	Mammal	Critically endangered	Yes	IDN 6
	Cupaniopsis strigosa		Plant	Vulnerable	Yes	
	Procordulia lompobatang		Odonata	Endangered	Yes	
Lore Lindu (Central Sulawesi), 42	*Cacatua sulphurea**	Yellow-crested cockatoo	Bird	Critically endangered	No	
	Caridina linduensis		Decapoda	Critically endangered	Yes	
	Leucocephalon yuwonoi	Sulawesi forest turtle	Reptile	Critically endangered	No	
	Vatica flavovirens		Plant	Critically endangered	No	
	Xenopoecilus sarasinorum	Sarasins minnow	Freshwater fish	Endangered	Yes	
Manusela (Maluku), 21	*Melomys aerosus*	Dusky melomys	Mammal	Endangered	Yes	IDN 13
	Melomys fraterculus	Manusela melomys	Mammal	Critically endangered	Yes	
	Myristica perlaevis		Plant	Vulnerable	Yes	
	Nesoromys ceramicus	Seram rat	Mammal	Endangered	Yes	
	Rhynchomeles prattorum	Ceram bandicoot	Mammal	Endangered	Yes	
	Shorea montigena		Plant	Critically endangered	No	
	Shorea selanica		Plant	Critically endangered	No	
Pulau Buano (Maluku), 2	*Monarcha boanensis*	Black-chinned monarch	Bird	Critically endangered	Yes	IDN 20
Feruhumpenai –Matano (Central Sulawesi), 46	*Caridina dennerli*	Cardinal shrimp	Decapoda	Endangered	Yes	
	Dermogenys weberi		Freshwater fish	Vulnerable	Yes	
	Knema celebica		Plant	Vulnerable	Yes	

KBA Name, Province, and # of Globally Threatened Species	Summary of Species at the Site that Score: - Extreme for Vulnerability (Critically Endangered) - Extreme for Irreplaceability (Single-site Endemic)			Red List Status (Vulnerability)	Believed to Be Single-Site Endemic (Irreplace-ability)	AZE Site #
	Scientific Name	Common Name	Species Group			
	Knema matanensis		Plant	Vulnerable	Yes	
	Mugilogobius adeia		Freshwater fish	Vulnerable	Yes	
	Mugilogobius latifrons		Freshwater fish	Vulnerable	Yes	
	Myristica devogelii		Plant	Vulnerable	Yes	
	Oryzias matanensis	Matano Medaka	Freshwater fish	Vulnerable	Yes	
	Parathelphusa pantherina		Decapoda	Vulnerable	Yes	
	Telmatherina abendanoni		Freshwater fish	Vulnerable	Yes	
	Telmatherina antoniae		Freshwater fish	Vulnerable	Yes	
	Telmatherina obscura		Freshwater fish	Vulnerable	Yes	
	Telmatherina opudi		Freshwater fish	Vulnerable	Yes	
	Telmatherina prognatha		Freshwater fish	Vulnerable	Yes	
	Telmatherina sarasinorum		Freshwater fish	Vulnerable	Yes	
	Telmatherina wahjui		Freshwater Fish	Vulnerable	Yes	
	Vatica flavovirens		Plant	Critically endangered	No	
Gunung Batu Putih (N. Maluku). 8	*Ornithoptera aesacus*		Lepidoptera	Vulnerable	Yes	
	Shorea selanica		Plant	Critically endangered	No	
Mahawu–Masarang (North Sulawesi), 13	*Macaca nigra*	Celebes crested macaque	Mammal	Critically endangered	No	
	Sundathelphusa rubra		Decapoda	Vulnerable	Yes	
Manupeu Tanadaru (E. Nusa Tenggara). 11	*Cacatua sulphurea*	Yellow-crested cockatoo	Bird	Critically endangered	No	
	Paragomphus tachyerges		Odonata	Vulnerable	Yes	
Mbeliling–Tanjung Kerita Mese (E Nusa Tenggara), 13	*Cacatua sulphurea*	Yellow-crested cockatoo	Bird	critically endangered	No	
	Knema steenisii		Plant	Vulnerable	Yes	
	Nisaetus floris	Flores hawk-eagle	Bird	critically endangered	No	
Taliabu Utara (N. Maluku). 4	*Shorea selanica*		Plant	critically endangered	No	IDN 27
	Tyto nigrobrunnea	Taliabu masked owl	Bird	Endangered	Yes	
Morowali (Central Sulawesi), 25	*Cacatua sulphurea*	Yellow-crested cockatoo	Bird	critically endangered	No	IDN 14
	Idea tambusisiana	Sulawesi tree nymph	Lepidoptera	Vulnerable	Yes	

KBA Name, Province, and # of Globally Threatened Species	Summary of Species at the Site that Score: - Extreme for Vulnerability (Critically Endangered) - Extreme for Irreplaceability (Single-site Endemic)			Red List Status (Vulnerability)	Believed to Be Single-Site Endemic (Irreplace-ability)	AZE Site #
	Scientific Name	Common Name	Species Group			
Pulau Tana Jampea (South Sulawesi), 3	*Cacatua sulphurea*	Yellow-crested cockatoo	Bird	Critically endangered	No	IDN 28
	Monarcha everetti	White-tipped monarch	Bird	Endangered	Yes	
Ruteng (E Nusa Tenggara). 15	*Nisaetus floris*	Flores hawk-eagle	Bird	Critically endangered	No	IDN 22
	Paulamys naso	Flores long-nosed rat	Mammal	Endangered	Yes	
	Suncus mertensi	Flores Shrew	Mammal	Endangered	Yes	
Sanana (N Maluku), 3	*Callulops kopsteini*		Amphibian	Endangered	Yes	IDN 24
	Shorea selanica		Plant	Critically endangered	No	
Gunung Kepala Madang, Maluku, 14	*Troides prattorum*		Lepidoptera	Vulnerable	Yes	IDN 5
	Charmosyna toxopei		Bird	Critically endangered	No	
	Shorea montigena		Tree	Critically endangered	No	
	Shorea selanica		Tree	Critically endangered	No	
Pegunungan Tokalekaju, West Sulawesi, 25	*Leucocephalon yuwonoi*		Reptile	Critically endangered	No	
	Euploea cordelia		Lepidoptera	Vulnerable	yes	
	Euploea magou		Lepidoptera	Vulnerable	Yes	
	Cacatua sulphurea		Bird	Critically endangered	No	
Aketajawe, North Maluku, 10	*Nepenthes danseri*		Plant	Vulnerable	Yes	
	Shorea montigena		Tree	Critically endangered	No	
Morotai, North Maluku (10)	*Guioa malukuensis*		Tree	Vulnerable	Yes	
	Madhuca boerlageana		Tree	Critically endangered	No	
Kokolomboi, Central Sulawesi, 2	*Corvus unicolor*		Bird	Critically endangered	Yes	

*Note: These are pre-1979 records and the species may no longer exist at this site.

Thirteen of the highest priority sites are in the provinces of Sulawesi — nine on the main island, and four on surrounding small islands, with clusters of priority KBAs in North and Central Sulawesi. Three sites are in East Nusa Tenggara, on Flores and Sumba. North Maluku has five sites, and Maluku has three. The two sites on the islands of North Sulawesi, Sangihe and Siau stand out for the high concentration of critically endangered

species in two very small areas of habitat. The forests and lakes of the central part of Sulawesi, Lore Lindu, Lake Poso, and the Malili lakes — Mahalona, Matano and Towuti (Towuti scores high-high) — are outstanding for the very high number of single-site endemics and threatened species.

There is a second layer of priority KBAs that score extreme for either vulnerability or irreplaceability, and high for the other. There are 77 such KBAs. Another 42 combine scores of medium and extreme, while the remaining 108 combine high-high, or scores of high, medium and low (Annex 3).

The 24 priority KBAs include 11 of the 16 Alliance for Zero Extinction sites in Wallacea. The remaining four AZE sites are covered by KBAs that score high (not extreme) for irreplaceability. AZE sites, which are defined for single-site, endangered or critically endangered species, would be expected to score extreme for irreplaceability. In these five cases, the difference is because:

- The species that triggered the identification of the AZE site is known from another site (Roti Island, or Rote island, Salibabu).
- The site defined as a single site by AZE is treated as two KBAs (Karakelang and Peleng-Banggai).

The large number of KBAs in the second layer of biological priority does not offer a useful approach to prioritizing sites beyond the 24 identified above. To overcome this, a complementarity analysis was carried out to identify the minimum critical set of sites that need to be conserved to ensure that each threatened species is included in at least one site. As with the analysis above, an adjusted number of sites was used for each species to avoid giving undue weight to species that appear to occur at only one site because of lack of data, or to species that occur widely outside Wallacea. The analysis ranked the site with the highest number of single-site endemics first, the site that could then contribute the greatest number of additional single-site species second, and so on, until all of Wallacea's threatened species were covered by at least one KBA. A network of 50 KBAs was identified (Table 4.12), including the 24 identified as priorities using the vulnerability–irreplaceability approach described above. Two are in Timor-Leste and 48 in Indonesia.

Table 4.12. Network of 50 KBAs Covering All Threatened Species for Which Wallacea Is Important

KBA Code	KBA Name	Area (ha)	Bioregion	Protection Status	Included in 24 Priority KBAs
IDN003	Karakelang Utara	32,242	Sulawesi	Partially protected	No
IDN012	Gunung Sahendaruman	4,392	Sulawesi	Unprotected	Yes
IDN015	Pulau Siau	11,662	Sulawesi	Unprotected	Yes
IDN027	Danau Tondano	6,367	Sulawesi	Unprotected	Yes
IDN029	Mahawu–Masarang	878	Sulawesi	Unprotected	Yes
IDN037	Bogani Nani Wartabone	400,094	Sulawesi	Partially protected	No

KBA Code	KBA Name	Area (ha)	Bioregion	Protection Status	Included in 24 Priority KBAs
IDN043	Molonggota	2,225	Sulawesi	Unprotected	No
IDN066	Pegunungan Tokalekaju	400,577	Sulawesi	Unprotected	Yes
IDN067	Lore Lindu	255,390	Sulawesi	Partially protected	Yes
IDN073	Danau Poso	69,079	Sulawesi	Partially protected	Yes
IDN074	Morowali	282,039	Sulawesi	Partially protected	Yes
IDN075	Gunung Lumut	95,767	Sulawesi	Unprotected	No
IDN078	Kepulauan Togean	76,412	Sulawesi	Protected	No
IDN083	Kokolomboi	50,614	Sulawesi	Unprotected	Yes
IDN084	Bajomote–Pondipondi	52,025	Sulawesi	Unprotected	No
IDN089	Taliabu Utara	156,112	Sulawesi	Partially protected	Yes
IDN093	Sanana	36,967	Sulawesi	Unprotected	Yes
IDN095	Feruhumpenai–Matano	142,903	Sulawesi	Partially protected	Yes
IDN096	Danau Mahalona	5,171	Sulawesi	Partially protected	Yes
IDN097	Danau Towuti	96,662	Sulawesi	Partially protected	No
IDN115	Buton Utara	118,135	Sulawesi	Partially protected	No
IDN116	Lambusango	59,214	Sulawesi	Partially protected	No
IDN129	Pegunungan Latimojong	149,037	Sulawesi	Unprotected	No
IDN130	Danau Tempe	32,024	Sulawesi	Unprotected	No
IDN134	Bantimurung Bulusaraung	47,846	Sulawesi	Protected	No
IDN138	Karaeng–Lompobattang	32,814	Sulawesi	Partially protected	Yes
IDN140	Pulau Selayar	66,622	Sulawesi	Unprotected	No
IDN143	Pulau Tana Jampea	16,285	Sulawesi	Unprotected	Yes
IDN145	Morotai	239,680	Maluku	Unprotected	Yes
IDN156	Kao	4,911	Maluku	Unprotected	No
IDN163	Ternate	9,080	Maluku	Unprotected	No
IDN165	Aketajawe	168,083	Maluku	Protected	Yes
IDN172	Yaba	20,158	Maluku	Unprotected	No
IDN185	Gunung Batu Putih	75,558	Maluku	Partially protected	Yes
IDN186	Cabang Kuning	9,336	Maluku	Unprotected	No
IDN192	Gunung Kepala Madang	133,317	Maluku	Unprotected	Yes
IDN194	Danau Rana	63,100	Maluku	Unprotected	No
IDN199	Pulau Buano	13,616	Maluku	Unprotected	Yes
IDN212	Manusela	248,077	Maluku	Partially protected	Yes
IDN218	Kepulauan Banda	5,018	Maluku	Partially protected	No
IDN222	Pegunungan Daab–Boo	28,623	Maluku	Partially protected	No
IDN231	Gunung Rinjani	139,270	Lesser Sunda	Partially protected	No
IDN268	Manupeu Tanadaru	51,887	Lesser Sunda	Protected	Yes
IDN280	Komodo–Rinca	61,698	Lesser Sunda	Protected	No
IDN284	Mbeliling -Tanjung Kerita Mese	33,549	Lesser Sunda	Unprotected	Yes

KBA Code	KBA Name	Area (ha)	Bioregion	Protection Status	Included in 24 Priority KBAs
IDN288	Ruteng	40,744	Lesser Sunda	Partially protected	Yes
IDN336	Tanimbar Tengah	116,888	Lesser Sunda	Partially protected	No
IDN345	Camplong	12,714	Lesser Sunda	Unprotected	No
TLS001	Nino Konis Santana	67,483	Lesser Sunda	Protected	No
TLS010	Mundo Perdido	25,899	Lesser Sunda	Protected	No

4.2.2.2. Marine KBAs

Confirmed location records were found for 186 of the 252 globally threatened marine species, and 74 marine KBAs were identified on this basis. To complete the marine KBA network and maximize the chance of covering the 66 species for which no locality data was available, an additional 66 candidate marine KBAs were identified with reference to existing marine protected areas, priority areas identified in recent marine priority setting processes, and proposed marine protected areas identified in that analysis. Outside these areas, candidate KBAs were also identified where important marine conservation values and terrestrial KBAs form a contiguous area. The analysis was discussed and refined with local stakeholders, experts and conservation organizations.

The 140 marine KBAs and candidate marine KBAs cover more than 9.5 million hectares and are, on average, 68,000 hectares — almost twice the size of terrestrial KBAs.

Species data for marine KBAs and candidate marine KBAs were inadequate to allow prioritization of sites. Instead, as described below, marine corridors were prioritized, along with the KBAs within them (see the section on Marine Corridors).

4.2.2.3. Legal Protection of KBAs

In Indonesia, a fundamental division of the legal status of land is into forest estate and nonforest estate. The forest estate is managed under the authority of the central Ministry of Forestry (although this has come under challenge in the last few years — see Chapter 6 on Policy), and is divided into conservation forests, watershed protection forests, and forests that can be exploited or (in some cases) converted. The forest estate in Indonesian Wallacea covers 23.4 million hectares, 69 percent of the total land area, with 2.7 million hectares of the forest estate set aside for biodiversity conservation.

More than three-quarters of the area of terrestrial KBAs (7.9 million hectares, 88 percent) is within the national forest estate, with 30 percent in forests designated for conservation (Table 4.13), 30 percent in forests designated for watershed protection, and 27 percent in forests where licenses for timber exploitation or conversion to nonforest uses may be granted. This pattern varies significantly between the subregions, with Maluku having 95 percent of its KBA area within the national forest estate, and over a third of this (37 percent) within forests that can be licensed for production. Nusa Tenggara, by contrast, has 76 percent of the KBA area within the national forest estate, 24 percent outside.

Of the 2.7 million hectares on KBAs that are within conservation areas in Indonesia, half (1.4 million hectares, 52 percent) is within 11 national parks, each with its own management budget and human resources. The remainder (1.3 million hectares, 48 percent) is in strict nature reserves, wildlife reserves, and other conservation reserves that are managed by regional Natural Resource Management agency staff. Seventy percent of the terrestrial KBA area in Indonesia (6.2 million hectares) is outside the formal protected areas network.

Table 4.13. Total Area of KBAs in Different Categories of State and Nonstate Land in Indonesia, per Subregion

Bioregion	Conservation		Watershed Protection		Production		Outside State Forests		Total
	ha	%	ha	%	ha	%	ha	%	ha
Sulawesi	1,648,471	32	1,741,223	34	1,208,735	23	577,071	11	5,175,500
Maluku	606,638	29	617,416	29	784,462	37	107,992	5	2,116,508
Nusa Tenggara	492,102	29	354,124	21	443,968	26	400,859	24	1,691,053
ALL	**2,747,211**	31	**2,712,763**	30	**2,437,165**	27	**1,085,922**	12	**8,983,061**

In Timor-Leste, 12 terrestrial areas and four marine areas were designated protected areas by the U.N. Transitional Administration (Decree UNTAET 19/2000). Eleven of these are Important Bird Areas (Trainor *et al.* 2007). Subsequently, three of the sites were combined to form Nino Konis Santana National Park, which is the only protected area legally designated by the Timorese government, although the UNTAET regulation still applies to the others. After a long period of field survey and community consultation, a decree has been written designating 50 areas for protection, and it is currently being discussed by the Council of Ministers, the final stage before passage. When passed, the decree will confirm the protection of the areas covered by UNTAET, and protect at least a further nine terrestrial KBAs, bringing the total to 20 of the 23 KBAs (and possibly more; maps of the areas are not available, and this total is based on matching site names with KBA names). While boundaries of the proposed new protected areas have not been fixed, it is not possible to be sure what proportion of the KBAs will be included in the protected areas. The decree refers to IUCN categories for protected areas, but does not specify categories for the proposed areas, instead requiring further consultation with local stakeholders.

Table 4.14. Summary of the Protection Status of KBAs in Timor-Leste

	Protected under UNTAET Decree 19/2000 and Declaration of the National Park	KBAs Covered by the Proposed 50 Protected Areas in the Draft Decree (includes 12 KBAs under UNTAET)	Unprotected and Apparently Not Included in the Proposed PA List
# Terrestrial KBAs	12	20	3
# Marine KBAs	4	0	12
Total	16	5	15

4.2.2.4. Ridge to Reef KBAs

Where a terrestrial and 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 KBA only because there are differences in priority-setting methods, and because the quality and availability of data is 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 — different departments within a ministry in Timor-Leste, 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 total, there are 64 terrestrial KBAs contiguous with 58 marine KBAs. In 37 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. Table 2.3 in Annex 2 lists the KBAs concerned. In addition, many terrestrial KBAs protect forests on the upper catchments of rivers that drain into marine KBAs, even when the two sites are not contiguous.

4.2.2.5 Maps and Lists of KBAs per Subregion

The following tables and maps detail all terrestrial, marine and candidate KBAs per bioregion, with Lesser Sundas divided into Indonesia and Timor-Leste. Each KBA is identified by a unique code.

The legal protection status of KBAs is shown in the column labeled Protected Area, with the following codes:

- PP = partially protected (more than 10 percent to less than 90 percent of the KBA is included in a protected area).
- No = unprotected (less than 10 percent of the KBA is included in a protected area).
- Yes = protected (more than 90 percent of the KBA area is included in a protected area).

The 24 terrestrial KBAs of highest biological priority because they support critically endangered species and species not known to occur at any other sites (see Section 4.2.2 and Table 4.11) are indicated in **bold** text in the tables.

The 50 terrestrial KBAs that make up a complementary network of sites covering all globally threatened species at least once are indicated in the tables with <u>underlined text</u> and on the maps by KBA polygons with green border (see map key). All of the 24 high-priority sites are also on this list.

Figure 4.1. Map of KBAs in Northern Sulawesi

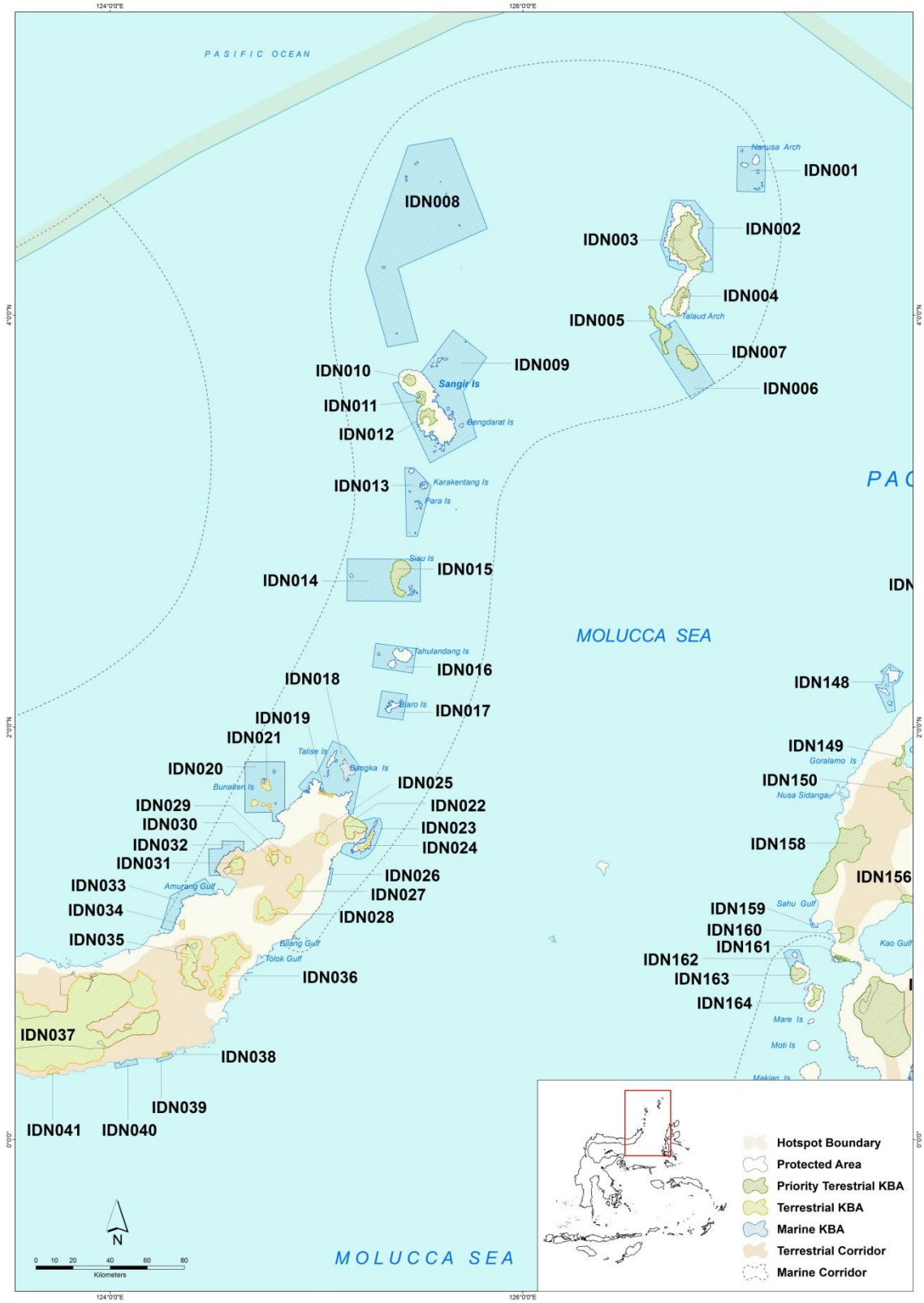


Figure 4.2. Map of KBAs in Central Sulawesi

Figure 4.3. Map of KBAs in South and Southeast Sulawesi

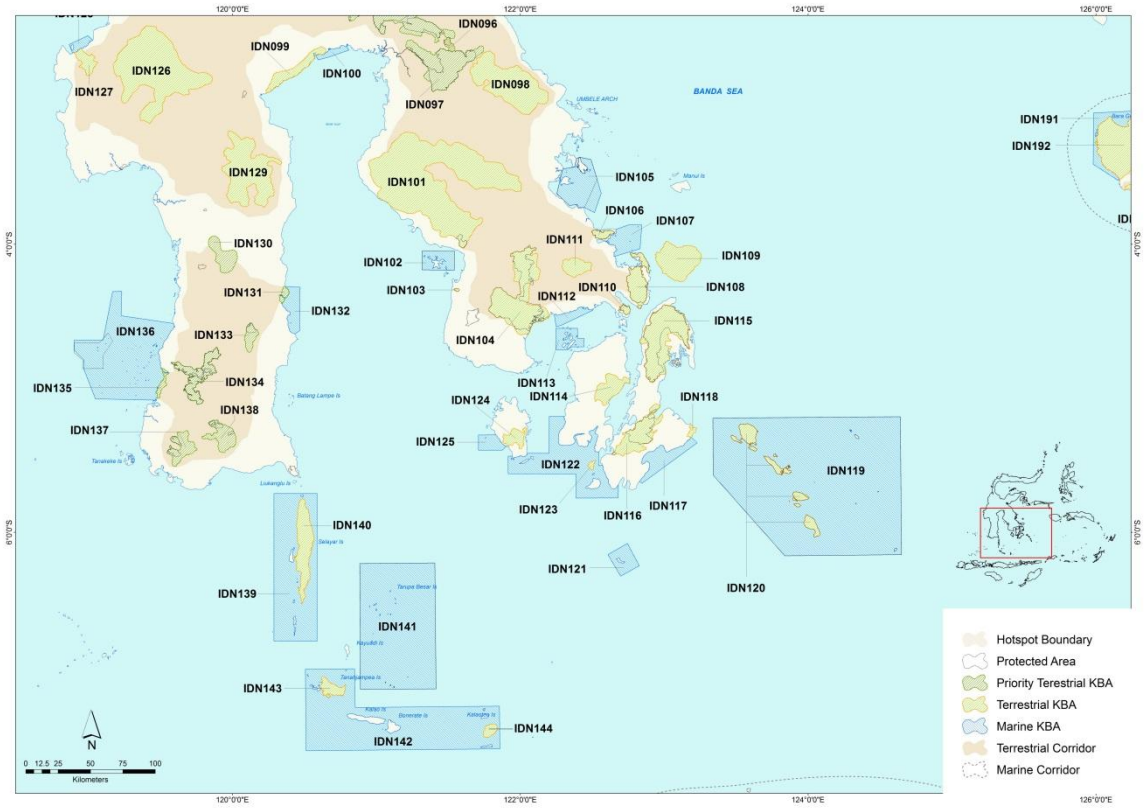


Table 4.15. Terrestrial KBAs in Sulawesi

Code	KBA Name	Province	Area (ha)	Protected Area	Corridor
IDN003	Karakelang Utara	North Sulawesi	32,242	PP	No corridor
IDN004	Karakelang Selatan	North Sulawesi	6,559	PP	No corridor
IDN005	Pulau Salibabu	North Sulawesi	9,082	No	No corridor
IDN007	Pulau Kabaruan	North Sulawesi	9,444	No	No corridor
IDN010	Gunung Awu	North Sulawesi	3,043	No	No corridor
IDN011	Tahuna	North Sulawesi	2,248	No	No corridor
IDN012	**Gunung Sahendaruman**	**North Sulawesi**	**4,392**	**No**	**No corridor**
IDN015	**Pulau Siau**	**North Sulawesi**	**11,662**	**No**	**No corridor**
IDN019	Likupang	North Sulawesi	895	No	North Sulawesi
IDN021	Mawori	North Sulawesi	3,955	Yes	No corridor

Code	KBA Name	Province	Area (ha)	Protected Area	Corridor
IDN022	Tangkoko Dua Sudara	North Sulawesi	9,649	Yes	North Sulawesi
IDN024	Lembeh	North Sulawesi	1,752	No	No corridor
IDN025	Gunung Klabat	North Sulawesi	3,538	No	North Sulawesi
IDN027	**Danau Tondano**	**North Sulawesi**	**6,367**	**No**	**North Sulawesi**
IDN028	Soputan–Manimporok	North Sulawesi	9,955	No	North Sulawesi
IDN029	**Mahawu–Masarang**	**North Sulawesi**	**878**	**No**	**North Sulawesi**
IDN030	Gunung Lokon	North Sulawesi	3,642	PP	North Sulawesi
IDN031	Gunung Manembo-nembo	North Sulawesi	4,879	PP	North Sulawesi
IDN034	Gunung Sinonsayang	North Sulawesi	1,101	No	North Sulawesi
IDN035	Gunung Ambang	North Sulawesi	21,102	PP	North Sulawesi
IDN036	Gunung Simbalang	North Sulawesi	35,436	No	North Sulawesi
IDN037	Bogani Nani Wartabone	Gorontalo	400,094	PP	North Sulawesi
IDN038	Tanjung Binerean	North Sulawesi	636	No	North Sulawesi
IDN041	Milangodaa	North Sulawesi	1,136	No	North Sulawesi
IDN042	Puncak Botu	Gorontalo	392	No	North Sulawesi
IDN043	**Molonggota**	**Gorontalo**	**2,225**	**No**	**North Sulawesi**
IDN046	Mas Popaya Raja	Gorontalo	158	Yes	No corridor
IDN047	Tangale	Gorontalo	1,132	Yes	No Corridor
IDN048	Muara Paguyaman Pantai	Gorontalo	8,216	No	North Sulawesi
IDN049	Nantu	Gorontalo	53,506	PP	North Sulawesi
IDN050	Dulamayo	Gorontalo	25,455	No	North Sulawesi
IDN052	Panua	Gorontalo	50,715	Yes	North Sulawesi
IDN053	Popayato–Paguat	Gorontalo	72,256	No	North Sulawesi
IDN054	Gunung Ile-Ile	Gorontalo	23,774	No	North Sulawesi
IDN055	Tanjung Panjang	Gorontalo	7,605	Yes	North Sulawesi
IDN057	Buol–Tolitoli	Gorontalo	174,569	No	North Sulawesi
IDN058	Gunung Dako	Central Sulawesi	64,774	PP	North Sulawesi
IDN060	Gunung Tinombala	Central Sulawesi	46,086	PP	North Sulawesi
IDN061	Gunung Sojol	Central Sulawesi	96,182	PP	North Sulawesi
IDN062	Siraro	Central Sulawesi	793	No	North Sulawesi
IDN064	Pasoso	Central Sulawesi	19,256	No	Central Sulawesi
IDN066	**Pegunungan Tokalekaju**	**West Sulawesi**	**400,577**	**No**	**Central Sulawesi**
IDN067	**Lore Lindu**	**Central Sulawesi**	**255,390**	**PP**	**Central Sulawesi**
IDN069	Tambu	Central Sulawesi	10,225	No	Central Sulawesi
IDN071	Lariang	West Sulawesi	7,358	No	Central Sulawesi
IDN072	Pambuang	West Sulawesi	166,865	No	Central Sulawesi

Code	KBA Name	Province	Area (ha)	Protected Area	Corridor
IDN073	**Danau Poso**	**South Sulawesi**	**69,079**	**PP**	**Central Sulawesi**
IDN074	**Morowali**	**Central Sulawesi**	**282,039**	**PP**	**Central Sulawesi**
IDN075	Gunung Lumut	Central Sulawesi	95,767	No	Central Sulawesi
IDN076	Tanjung Colo	Central Sulawesi	3,410	Yes	Central Sulawesi
IDN078	Kepulauan Togean	Central Sulawesi	76,412	Yes	No corridor
IDN080	Bakiriang	Central Sulawesi	73,277	PP	Central Sulawesi
IDN082	Labobo–Bangkurung	Central Sulawesi	18,657	No	No corridor
IDN083	**Kokolomboi**	**Central Sulawesi**	**50,614**	**No**	**No corridor**
IDN084	Bajomote–Pondipondi	Central Sulawesi	52,025	No	No corridor
IDN085	Timbong	Central Sulawesi	22,730	No	No corridor
IDN086	Balantak	Central Sulawesi	42,616	No	Central Sulawesi
IDN088	Pulau Seho	North Maluku	2,741	PP	No corridor
IDN089	**Taliabu Utara**	**North Maluku**	**156,112**	**PP**	**No corridor**
IDN091	Buya	North Maluku	27,466	No	No corridor
IDN092	Loku	North Maluku	23,369	No	No corridor
IDN093	**Sanana**	**North Maluku**	**36,967**	**No**	**No corridor**
IDN095	**Feruhumpenai–Matano**	**South Sulawesi**	**142,903**	**PP**	**Central Sulawesi**
IDN096	**Danau Mahalona**	**South Sulawesi**	**5,171**	**PP**	**Central Sulawesi**
IDN097	Danau Towuti	South Sulawesi	96,662	PP	Central Sulawesi
IDN098	Routa	South Sulawesi	144,439	No	Central Sulawesi
IDN099	Lamiko-miko	South Sulawesi	34,523	No	No corridor
IDN101	Mekongga	Southeast Sulawesi	472,289	No*	Central Sulawesi
IDN103	Lamadae	Southeast Sulawesi	669	Yes	Central Sulawesi
IDN104	Rawa Aopa Watumohai	Southeast Sulawesi	143,858	PP	Central Sulawesi
IDN106	Nipa-nipa	Southeast Sulawesi	7,895	Yes	Central Sulawesi
IDN108	Tanjung Peropa	Southeast Sulawesi	41,694	Yes	Central Sulawesi
IDN109	Pulau Wawonii	Southeast Sulawesi	71,702	No	No Corridor
IDN110	Tanjung Batikolo	Southeast Sulawesi	3,992	Yes	Central Sulawesi
IDN111	Baito–Wolasi	Southeast Sulawesi	23,616	No	Central Sulawesi
IDN114	Muna Timur	Southeast Sulawesi	32,912	No	No corridor
IDN115	Buton Utara	Southeast Sulawesi	118,135	PP	No corridor
IDN116	Lambusango	Southeast Sulawesi	59,214	PP	No corridor
IDN118	Ambuau	Southeast Sulawesi	3,570	No	No corridor
IDN120	Wakatobi	Southeast Sulawesi	44,964	No	No corridor
IDN123	Pulau Kadatua	Southeast Sulawesi	2,422	No	No corridor
IDN124	Gunung Watusangia	Southeast Sulawesi	17,171	No	No corridor

Code	KBA Name	Province	Area (ha)	Protected Area	Corridor
IDN126	Mambuliling	West Sulawesi	265,951	No*	Central Sulawesi
IDN127	Mamuju	West Sulawesi	18,245	No	Central Sulawesi
IDN129	Pegunungan Latimojong	South Sulawesi	149,037	No	Central Sulawesi
IDN130	Danau Tempe	South Sulawesi	32,024	No	South Sulawesi
IDN131	Pallime	South Sulawesi	5,434	No	South Sulawesi
IDN133	Cani Sirenreng	South Sulawesi	14,435	PP	South Sulawesi
IDN134	Bantimurung Bulusaraung	South Sulawesi	47,846	Yes	South Sulawesi
IDN135	Bulurokeng	South Sulawesi	7,147	No	South Sulawesi
IDN137	Komara	South Sulawesi	30,049	PP	South Sulawesi
IDN138	**Karaeng–Lompobattang**	**South Sulawesi**	**32,814**	**PP**	**South Sulawesi**
IDN140	Pulau Selayar	South Sulawesi	66,622	No	No corridor
IDN143	**Pulau Tana Jampea**	**South Sulawesi**	**16,285**	**No**	**No corridor**
IDN144	Pulau Kalatoa	South Sulawesi	8,038	No	No Corridor

*: These sites have been proposed as a protected areas but are not yet legally established.

Table 4.16: Marine KBAs and Candidate KBAs in Sulawesi

Code	KBA Name	Province	Area (ha)	Protected Area	Marine Corridor	KBA status
IDN001	Kepulauan Nanusa	North Sulawesi	33,439	No	Sulawesi Utara	Confirmed
IDN002	Perairan Karakelang Utara	North Sulawesi	32,434	No	Sulawesi Utara	Confirmed
IDN006	Perairan Talaud Selatan	North Sulawesi	47,250	No	Sulawesi Utara	Confirmed
IDN008	Kawaluso	North Sulawesi	342,413	No	Sulawesi Utara	Confirmed
IDN009	Perairan Sangihe	North Sulawesi	132,752	No	Sulawesi Utara	Confirmed
IDN013	Mahangetang	North Sulawesi	33,683	No	Sulawesi Utara	Confirmed
IDN014	Perairan Siau	North Sulawesi	77,152	No	Sulawesi Utara	Confirmed
IDN016	Perairan Tagulandang	North Sulawesi	21,793	No	Sulawesi Utara	Confirmed
IDN017	Perairan Biaro	North Sulawesi	16,946	No	Sulawesi Utara	Confirmed
IDN018	Perairan Likupang	North Sulawesi	55,690	No	Sulawesi Utara	Confirmed

IDN020	Molaswori	North Sulawesi	55,559	Yes	Sulawesi Utara	Confirmed
IDN023	Selat Lembeh	North Sulawesi	17,589	No	Sulawesi Utara	Confirmed
IDN026	Tulaun Lalumpe	North Sulawesi	1,392	No	Sulawesi Utara	Confirmed
IDN032	Perairan Arakan Wawontulap	North Sulawesi	15,134	PP	Sulawesi Utara	Confirmed
IDN033	Amurang	North Sulawesi	24,347	Yes	Sulawesi Utara	Confirmed
IDN039	Perairan Tanjung Binerean	North Sulawesi	1,618	No	No corridor	Candidate
IDN040	Pantai Modisi	North Sulawesi	3,353	No	No corridor	Confirmed
IDN044	Perairan Molonggota	Gorontalo	2,304	No	No corridor	Confirmed
IDN045	Perairan Mas Popaya Raja	Gorontalo	59,068	No	No corridor	Confirmed
IDN051	Perairan Panua	Gorontalo	44,248	No	No corridor	Candidate
IDN056	Perairan Tanjung Panjang	Gorontalo	21,769	No	No corridor	Confirmed
IDN059	Teluk Dondo	Central Sulawesi	211,621	No	Barat Sulawesi Tegah	Candidate
IDN063	Perairan Maputi	Central Sulawesi	13,127	No	Barat Sulawesi Tegah	Confirmed
IDN065	Tanjung Manimbaya	Central Sulawesi	27,657	No	Barat Sulawesi Tegah	Candidate
IDN068	Perairan Kayumaloa	West Sulawesi	7,968	No	Barat Sulawesi Tegah	Confirmed
IDN070	Perairan Tambu	Central Sulawesi	16,320	No	No corridor	Candidate
IDN077	Perairan Kepulauan Togean	Central Sulawesi	341,275	Yes	Togean–Banggai	Confirmed
IDN079	Perairan Pagimana	Central Sulawesi	1,071	No	Togean–Banggai	Confirmed
IDN081	Perairan Peleng–Banggai	Central Sulawesi	509,722	PP	Togean–Banggai	Confirmed
IDN087	Perairan Balantak	Central Sulawesi	6,218	No	Togean–Banggai	Candidate
IDN090	Perairan Taliabu Utara	North Maluku	21,103	No	No corridor	Confirmed
IDN094	Pulau Lifamatola	North Maluku	18,695	No	No corridor	Confirmed
IDN100	Perairan Lamiko–Miko	South Sulawesi	10,620	No	No corridor	Candidate
IDN102	Kepulauan Padamarang	Southeast Sulawesi	33,036	PP	No corridor	Confirmed
IDN105	Teluk Lasolo–Labengki	Southeast Sulawesi	89,022	PP	No corridor	Confirmed
IDN107	Pulau Hari	Southeast Sulawesi	43,834	No	No corridor	Confirmed
IDN112	Pesisir Tinanggea	Southeast Sulawesi	18,809	No	No corridor	Candidate
IDN113	Selat Tiworo	Southeast Sulawesi	26,064	Yes	No corridor	Confirmed

IDN117	Wabula	Southeast Sulawesi	47,140	No	No corridor	Confirmed
IDN119	Perairan Wakatobi	Southeast Sulawesi	1,325,168	Yes	No corridor	Confirmed
IDN121	Pulau Batu Atas	Southeast Sulawesi	32,042	PP	No corridor	Confirmed
IDN122	Basilika	Southeast Sulawesi	204,895	No	No corridor	Confirmed
IDN125	Kepulauan Sagori	Southeast Sulawesi	20,832	No	No corridor	Confirmed
IDN128	Perairan Mamuju	West Sulawesi	11,032	No	No corridor	Candidate
IDN132	Perairan Pallime	South Sulawesi	35,694	No	No corridor	Candidate
IDN136	Kapoposang–Pangkep–Bulurokeng	South Sulawesi	376,797	Yes	No corridor	Confirmed
IDN139	Kepulauan Selayar	South Sulawesi	313,197	PP	No corridor	Confirmed
IDN141	Taka Bonerate	South Sulawesi	569,397	Yes	No corridor	Candidate
IDN142	Perairan Tana Jampea	South Sulawesi	565,327	No	No corridor	Candidate

Figure 4.4. Map of KBAs in Northern Maluku

Figure 4.5. Map of KBAs in Southern Maluku

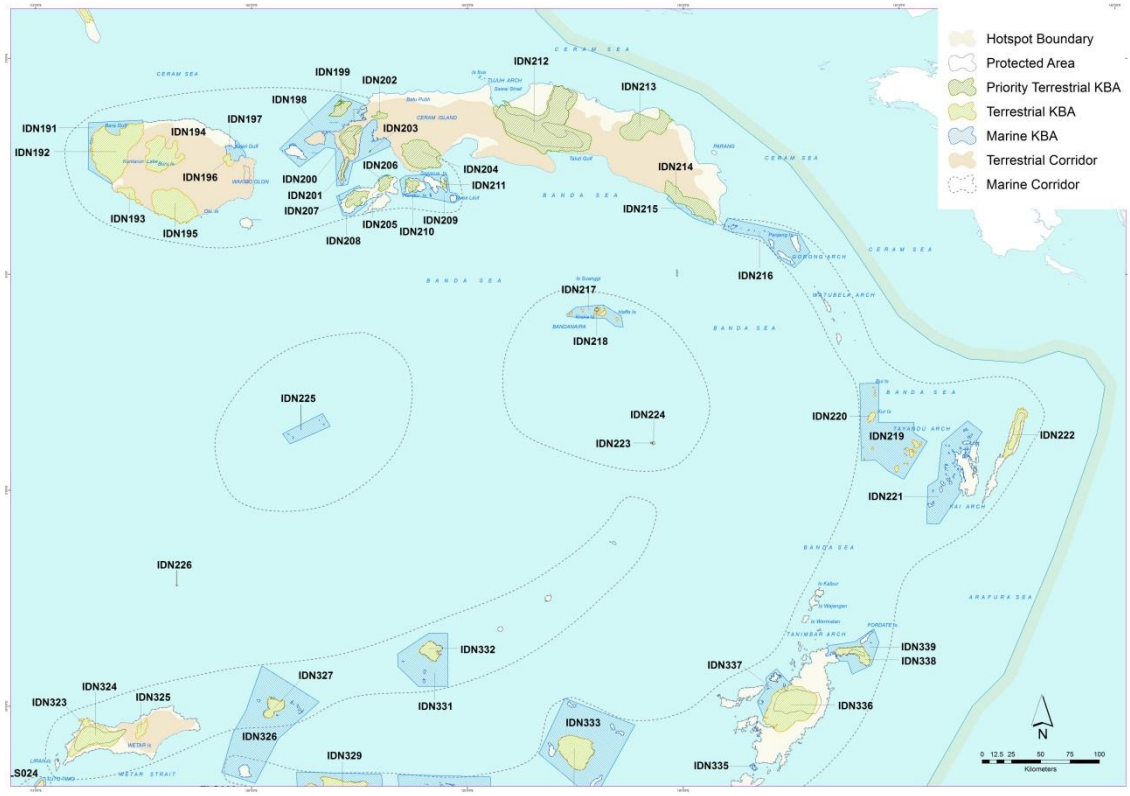


Table 4.17. Terrestrial KBAs in Maluku

Code	KBA Name	Province	Area (ha)	Protected Area	Corridor
IDN145	**Morotai**	**North Maluku**	**239,680**	**No**	**No corridor**
IDN147	Pulau Rao	North Maluku	11,193	No	No corridor
IDN149	Galela	North Maluku	3,361	No	Halmahera
IDN150	Gunung Dukono	North Maluku	54,763	No	Halmahera
IDN153	Halmahera Timur	North Maluku	369,723	PP	Halmahera
IDN154	Hutan Bakau Dodaga	North Maluku	2,472	No	Halmahera
IDN156	Kao	North Maluku	4,911	No	Halmahera
IDN158	Gamkonora	North Maluku	86,718	No	Halmahera
IDN160	Tanah Putih	North Maluku	10,731	No*	Halmahera

Code	KBA Name	Province	Area (ha)	Protected Area	Corridor
IDN161	Rawa Sagu Ake Jailolo	North Maluku	1,384	No	Halmahera
IDN163	Ternate	North Maluku	9,080	No	No Corridor
IDN164	Tidore	North Maluku	6,882	No	No Corridor
IDN165	**Aketajawe**	**North Maluku**	**168,083**	**Yes**	**Halmahera**
IDN167	Dote — Kobe	North Maluku	27,894	No	Halmahera
IDN170	Pulau Kayoa	North Maluku	13,605	No	No corridor
IDN171	Kasiruta	North Maluku	21,783	No	Halmahera
IDN172	Yaba	North Maluku	20,158	No	Halmahera
IDN173	Gorogoro	North Maluku	25,964	No	Halmahera
IDN174	Saketa	North Maluku	16,940	No	Halmahera
IDN177	Tutupa	North Maluku	16,568	No	Halmahera
IDN178	Gunung Sibela	North Maluku	54,990	PP	Halmahera
IDN179	Mandioli	North Maluku	12,078	No	Halmahera
IDN182	Obilatu	North Maluku	3,549	No	No corridor
IDN183	Danau Manis	North Maluku	5,164	No	No corridor
IDN184	Wayaloar	North Maluku	21,336	No	No corridor
IDN185	**Gunung Batu Putih**	**North Maluku**	**75,558**	**PP**	**No corridor**
IDN186	**Cabang Kuning**	**North Maluku**	**9,336**	**No**	**No corridor**
IDN188	Pulau Obit	North Maluku	7,125	Yes	No corridor
IDN192	**Gunung Kepala Madang**	**Maluku**	**133,317**	**No**	**Seram–Buru**
IDN193	Waemala	Maluku	10,901	No	Seram–Buru
IDN194	Danau Rana	Maluku	63,100	No	Seram–Buru
IDN195	Leksula	Maluku	80,085	No	Seram–Buru
IDN196	Teluk Kayeli	Maluku	5,699	No	Seram–Buru
IDN199	**Pulau Buano**	**Maluku**	**13,616**	**No**	**Seram–Buru**
IDN200	Gunung Sahuwai	Maluku	25,816	PP	Seram–Buru
IDN201	Luhu	Maluku	4,923	Yes	Seram–Buru

Code	KBA Name	Province	Area (ha)	Protected Area	Corridor
IDN202	Tullen Batae	Maluku	5,040	No	Seram–Buru
IDN203	Pulau Kassa	Maluku	44	No	Seram–Buru
IDN204	Pegunungan Paunusa	Maluku	59,525	No	Seram–Buru
IDN205	Gunung Salahutu	Maluku	10,135	No	Seram–Buru
IDN207	Leitimur	Maluku	16,671	No	Seram–Buru
IDN210	Haruku	Maluku	7,937	No	Seram–Buru
IDN211	Saparua	Maluku	1,859	No	Seram–Buru
IDN212	**Manusela**	**Maluku**	**248,077**	**PP**	**Seram–Buru**
IDN213	Waebula	Maluku	63,514	No	Seram–Buru
IDN214	Tanah Besar	Maluku	49,137	No	Seram–Buru
IDN218	Kepulauan Banda	Maluku	5,018	PP	No corridor
IDN220	Kepulauan Tayandu	Maluku	11,585	No	No corridor
IDN222	Pegunungan Daab–Boo	Maluku	28,623	PP	No corridor
IDN223	Pulau Manuk	Maluku	493	Yes	No corridor
IDN226	Pulau Gunung Api	Maluku	74	Yes	No corridor

Table 4.18. Marine KBAs and Candidate KBAs in Maluku

Code	KBA Name	Province	Area (ha)	Protected Area	Marine Corridor	KBA status
IDN146	Pulau-pulau Pesisir Morotai	North Maluku	62,790	No	Perairan Halmahera	Confirmed
IDN148	Loloda	North Maluku	14,635	No	Perairan Halmahera	Confirmed
IDN151	Pulau–Pulau Pesisir Tobelo	North Maluku	20,059	No	Perairan Halmahera	Confirmed
IDN152	Jara-Jara	North Maluku	6,910	No	Perairan Halmahera	Confirmed
IDN155	Teluk Wasile	North Maluku	20,997	No	Perairan Halmahera	Candidate
IDN157	Teluk Buli	North Maluku	152,228	No	Perairan Halmahera	Confirmed

Code	KBA Name	Province	Area (ha)	Protected Area	Marine Corridor	KBA status
IDN159	Tanjung Bobo	North Maluku	1,174	No	Perairan Halmahera	Confirmed
IDN162	Ternate–Hiri	North Maluku	6,216	No	Perairan Halmahera	Confirmed
IDN166	Weda Telope	North Maluku	8,880	No	Perairan Halmahera	Confirmed
IDN168	Perairan Dote-Kobe	North Maluku	14,938	No	Perairan Halmahera	Candidate
IDN169	Kayoa	North Maluku	126,294	No	Perairan Halmahera	Confirmed
IDN175	Kepulauan Widi	North Maluku	41,017	No	Perairan Halmahera	Confirmed
IDN176	Libobo	North Maluku	686	No	Perairan Halmahera	Candidate
IDN180	Perairan Mandioli	North Maluku	17,636	No	Perairan Halmahera	Candidate
IDN181	Selat Obilatu–Malamala	North Maluku	18,763	No	No corridor	Candidate
IDN187	Selat Obi	North Maluku	40,106	No	No corridor	Candidate
IDN189	Perairan Pulau Obit	North Maluku	6,432	No	No corridor	Candidate
IDN190	Jorongga	North Maluku	65,154	No	Perairan Halmahera	Candidate
IDN191	Liliali	Maluku	47,617	No	Bentang Laut Buru	Candidate
IDN197	Perairan Teluk Kayeli	Maluku	16,007	No	Bentang Laut Buru	Candidate
IDN198	Kelang–Kassa–Buano–Marsegu	Maluku	215,045	PP	Bentang Laut Buru	Confirmed
IDN206	Perairan Gunung Salahutu	Maluku	816	No	Bentang Laut Buru	Candidate
IDN208	Leihitu	Maluku	13,766	No	Bentang Laut Buru	Candidate
IDN209	Perairan HarukuSaparua	Maluku	47,985	No	No corridor	Confirmed
IDN215	Perairan Tanah Besar	Maluku	14,821	No	No corridor	Candidate
IDN216	Kepulauan Gorom	Maluku	101,147	No	Busur Banda Luar	Candidate
IDN217	Perairan Kepulauan Banda	Maluku	39,623	PP	Bentang Laut Banda	Confirmed
IDN219	Perairan Kepulauan Tayandu	Maluku	228,603	No	Busur Banda Luar	Candidate
IDN221	Perairan Tual	Maluku	167,040	No	Busur Banda Luar	Candidate
IDN224	Perairan Pulau Manuk	Maluku	120	No	Bentang Laut Banda	Candidate
IDN225	Kepulauan Lucipara	Maluku	43,209	No	Bentang Laut Lucipara	Confirmed

Figure 4.6. Map of KBAs in Western Lesser Sundas (West Nusa Tenggara)

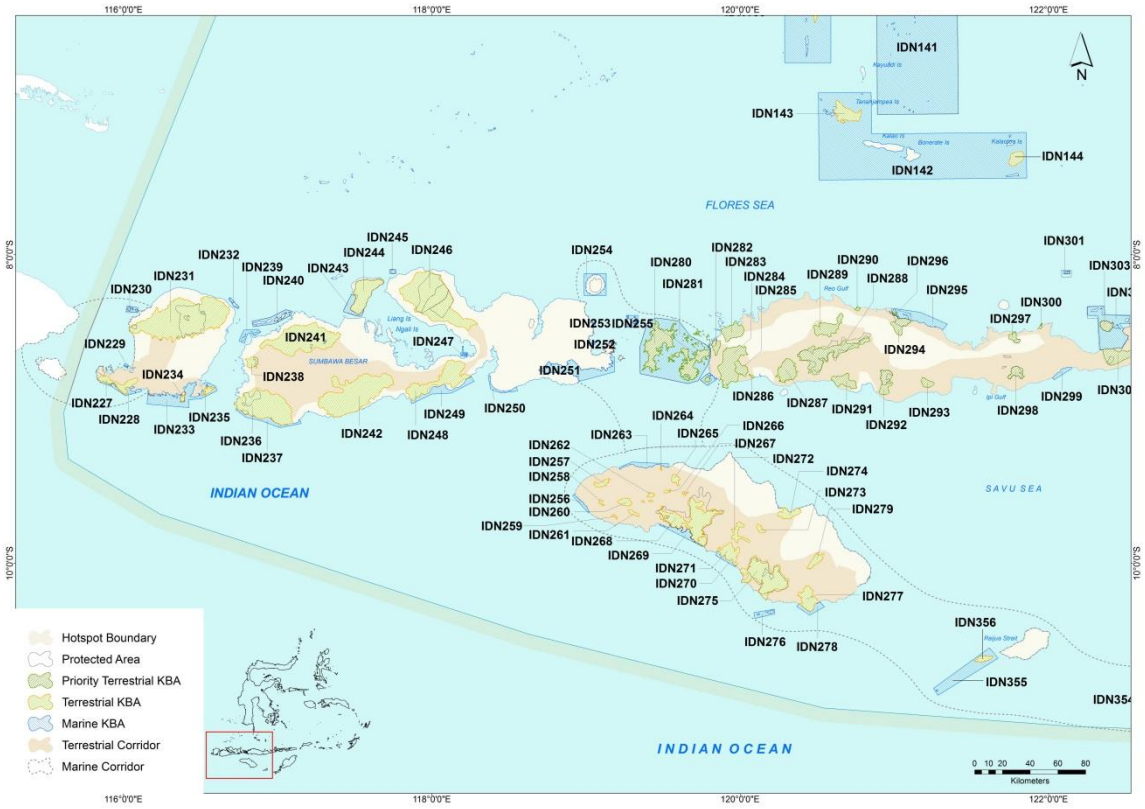


Figure 4.7. Map of KBAs in Eastern Lesser Sundas (Including Timor-Leste)

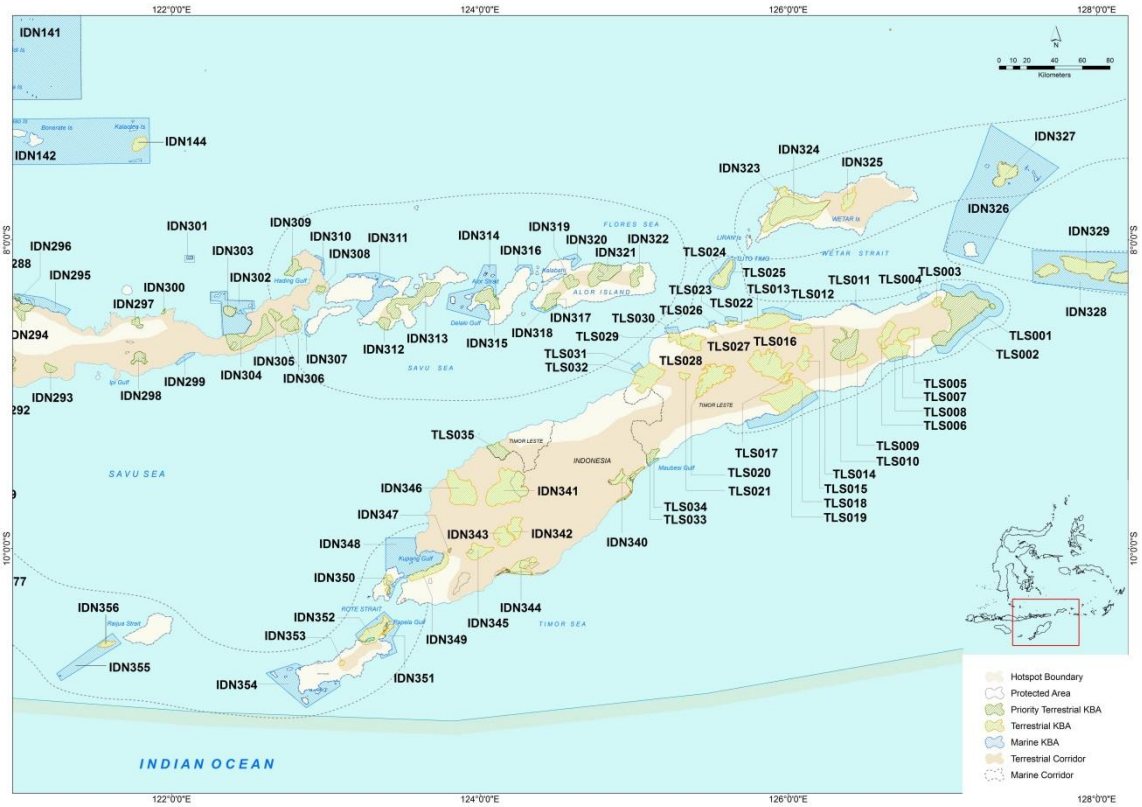


Table 4.19. Terrestrial KBAs in Nusa Tenggara

Code	KBA Name	Province	Area (ha)	Protected Area	Corridor
IDN227	Batu Gendang	West Nusa Tenggara	12,412	No	Sumbawa–Lombok
IDN231	Gunung Rinjani	West Nusa Tenggara	139,270	PP	Sumbawa–Lombok
IDN234	Bumbang	West Nusa Tenggara	1,385	PP	Sumbawa–Lombok
IDN235	Sekaroh	West Nusa Tenggara	2,728	No	Sumbawa–Lombok
IDN237	Tatar Sepang	West Nusa Tenggara	70,303	PP	Sumbawa–Lombok
IDN238	Taliwang	West Nusa Tenggara	5,494	PP	Sumbawa–Lombok
IDN241	Puncak Ngengas	West Nusa Tenggara	76,224	No	Sumbawa–Lombok
IDN242	Dodo Jaranpusang	West Nusa Tenggara	93,299	No	Sumbawa–Lombok
IDN244	Pulau Moyo	West Nusa Tenggara	29,997	Yes	Sumbawa–Lombok

Code	KBA Name	Province	Area (ha)	Protected Area	Corridor
IDN246	Gunung Tambora	West Nusa Tenggara	106,257	PP	Sumbawa–Lombok
IDN248	Empang	West Nusa Tenggara	42,331	No	Sumbawa–Lombok
IDN257	Rokoraka–Matalombu	East Nusa Tenggara	3,529	No	Sumba
IDN258	Cambaka	East Nusa Tenggara	841	No	Sumba
IDN259	Danggamangu	East Nusa Tenggara	495	No	Sumba
IDN260	Yawila	East Nusa Tenggara	4,060	No	Sumba
IDN261	Lamboya	East Nusa Tenggara	1,767	No	Sumba
IDN262	Poronumbu	East Nusa Tenggara	1,814	No	Sumba
IDN264	Kaliasin	East Nusa Tenggara	201	No	Sumba
IDN265	Lokusobak	East Nusa Tenggara	2,965	No	Sumba
IDN266	Baliledo	East Nusa Tenggara	839	No	Sumba
IDN267	Pahudu Tilu	East Nusa Tenggara	522	No	Sumba
IDN268	**Manupeu Tanadaru**	**East Nusa Tenggara**	**51,887**	**Yes**	**Sumba**
IDN271	Tarimbang	East Nusa Tenggara	12,668	No	Sumba
IDN272	Lai Kayambi	East Nusa Tenggara	6,607	No	Sumba
IDN273	Praipaha Mandahu	East Nusa Tenggara	2,191	No	Sumba
IDN274	Yumbu–Kandara	East Nusa Tenggara	7,947	No	Sumba
IDN275	Laiwanggi Wanggameti	East Nusa Tenggara	50,004	PP	Sumba
IDN277	Tanjung Ngunju	East Nusa Tenggara	14,674	No	Sumba
IDN279	Luku Melolo	East Nusa Tenggara	5,696	No	Sumba
IDN280	Komodo–Rinca	East Nusa Tenggara	61,698	Yes	Flores Coast
IDN282	Wae Wuul	East Nusa Tenggara	4,552	PP	Flores Coast
IDN283	Nggorang Bowosie	East Nusa Tenggara	13,990	No	Flores Coast
IDN284	**Mbeliling–Tanjung Kerita Mese**	**East Nusa Tenggara**	**33,549**	**No**	**Flores Forest; Flores Coast**
IDN285	Sesok	East Nusa Tenggara	6,569	No	Flores Forest
IDN286	Nangalili	East Nusa Tenggara	428	No	Flores Coast
IDN287	Todo Repok	East Nusa Tenggara	16,541	No	Flores Forest
IDN288	**Ruteng**	**East Nusa Tenggara**	**40,744**	**PP**	**Flores Forest**
IDN289	Gapong	East Nusa Tenggara	14,960	No	Flores Forest
IDN290	Pota	East Nusa Tenggara	717	No	Flores Coast
IDN291	Nangarawa	East Nusa Tenggara	10,885	No	Flores Forest
IDN292	Gunung Inerie	East Nusa Tenggara	11,661	PP	Flores Forest
IDN293	Aegela	East Nusa Tenggara	4,054	No	Flores Forest
IDN294	Wolo Tado	East Nusa Tenggara	9,340	PP	Flores Coast
IDN296	Pulau Ontoloe	East Nusa Tenggara	377	Yes	Flores Coast

Code	KBA Name	Province	Area (ha)	Protected Area	Corridor
IDN297	Mausambi	East Nusa Tenggara	3,552	PP	Flores Coast
IDN298	Kelimutu	East Nusa Tenggara	6,320	PP	Flores Forest
IDN300	Tanjung Watu Mana	East Nusa Tenggara	433	No	Flores Coast
IDN303	Pulau Besar	East Nusa Tenggara	5,327	Yes	No corridor
IDN304	Egon Ilimedo	East Nusa Tenggara	27,716	No	Flores Forest; Flores Coast
IDN305	Ili Wengot	East Nusa Tenggara	4,097	No	Flores Forest
IDN306	Gunung Lewotobi	East Nusa Tenggara	9,832	No	Flores Forest
IDN308	Larantuka	East Nusa Tenggara	2,420	No	Flores Forest
IDN309	Tanjung Watupayung	East Nusa Tenggara	7,351	No	Flores Forest
IDN312	Lamalera	East Nusa Tenggara	5,891	No	Flores Forest
IDN313	Lembata	East Nusa Tenggara	30,821	No	Flores Forest
IDN315	Pantar	East Nusa Tenggara	14,255	No	Flores Forest
IDN317	Gunung Muna	East Nusa Tenggara	9,598	No	Flores Forest
IDN319	Mainang	East Nusa Tenggara	7,294	No	Flores Forest
IDN321	Tuti Adagae	East Nusa Tenggara	24,348	PP	Flores Forest
IDN322	Kunggwera	East Nusa Tenggara	8,803	No	Flores Forest
IDN323	Pulau Redong	Maluku	359	No	No corridor
IDN324	Gunung Arnau	Maluku	67,131	PP	Timor–Wetar
IDN325	Danau Tihu	Maluku	8,737	No	Timor–Wetar
IDN327	Pulau Romang	Maluku	17,257	No	No corridor
IDN329	Kepulauan Lemola	Maluku	57,487	No	No corridor
IDN332	Pulau Damar	Maluku	19,607	No	No corridor
IDN334	Pulau Babar	Maluku	61,842	No	No corridor
IDN336	Tanimbar Tengah	Maluku	116,888	PP	No corridor
IDN338	Pulau Larat	Maluku	21,974	PP	No corridor
IDN340	Kateri–Maubesi	East Nusa Tenggara	14,793	PP	Timor–Wetar
IDN341	Gunung Mutis	East Nusa Tenggara	52,788	PP	Timor–Wetar
IDN342	Buat–Soe	East Nusa Tenggara	10,656	No	Timor–Wetar
IDN343	Oenasi	East Nusa Tenggara	13,320	No	Timor–Wetar
IDN344	Manipo	East Nusa Tenggara	14,610	PP	Timor–Wetar
IDN345	Camplong	East Nusa Tenggara	12,714	No	Timor–Wetar
IDN346	Gunung Timau	East Nusa Tenggara	36,150	No	Timor–Wetar
IDN347	Bipolo	East Nusa Tenggara	417	Yes	Timor–Wetar
IDN349	Teluk Kupang	East Nusa Tenggara	15,452	No	Timor–Wetar
IDN350	Semau	East Nusa Tenggara	4,497	No	Timor–Wetar
IDN352	Rote Utara	East Nusa Tenggara	20,943	No	Timor–Wetar

Code	KBA Name	Province	Area (ha)	Protected Area	Corridor
IDN353	Danau Peto	East Nusa Tenggara	938	No	Timor– Wetar
IDN356	Pulau Dana	East Nusa Tenggara	3,929	No	No corridor

Table 4.20. Marine KBAs and Candidate KBAs in Nusa Tenggara

Code	KBA Name	Province	Area (ha)	Protected Area	Marine Corridor	KBA status
IDN228	Perairan Batu Gendang	West Nusa Tenggara	6,103	Yes	Selat Lombok	Candidate
IDN229	Lombok Barat	West Nusa Tenggara	592	Yes	Selat Lombok	Candidate
IDN230	Gili Ayer–Meno–Trawangan	West Nusa Tenggara	2,514	Yes	Selat Lombok	Confirmed
IDN232	Gili Sulat–Gili Lawang	West Nusa Tenggara	603	Yes	No corridor	Candidate
IDN233	Perairan Bumbang	West Nusa Tenggara	34,762	PP	No corridor	Candidate
IDN236	Lunyuk Besar	West Nusa Tenggara	9,612	No	No corridor	Candidate
IDN239	Sumbawa Barat	West Nusa Tenggara	5,785	No	No corridor	Candidate
IDN240	Pulau Panjang	West Nusa Tenggara	11,085	Yes	No corridor	Candidate
IDN243	Perairan Pulau Moyo	West Nusa Tenggara	7,884	Yes	No corridor	Candidate
IDN245	Perairan Pulau Satonda	West Nusa Tenggara	749	Yes	No corridor	Candidate
IDN247	Nisa–Teluk Saleh	West Nusa Tenggara	1,249	No	No corridor	Candidate
IDN249	Perairan Empang	West Nusa Tenggara	15,231	No	No corridor	Candidate
IDN250	Perairan Parado	West Nusa Tenggara	4,097	No	No corridor	Candidate
IDN251	Teluk Waworada	West Nusa Tenggara	35,648	No	Komodo–Selat Sumba	Candidate
IDN252	Perairan Bajo	West Nusa Tenggara	165	No	Komodo–Selat Sumba	Candidate
IDN253	Pulau Ular	West Nusa Tenggara	880	No	Komodo–Selat Sumba	Candidate
IDN254	Sangiang	West Nusa Tenggara	9,282	No	Komodo–Selat Sumba	Candidate
IDN255	Gili Banta	West Nusa Tenggara	4,038	Yes	Komodo–Selat Sumba	Candidate
IDN256	Pero	East Nusa Tenggara	3,043	No	Laut Sawu	Candidate

Code	KBA Name	Province	Area (ha)	Protected Area	Marine Corridor	KBA status
IDN263	Pantai Mananga Aba–Pantai Waeketo	East Nusa Tenggara	7,393	No	Laut Sawu	Confirmed
IDN269	Tangairi–Lukulisi–Konda Maloba	East Nusa Tenggara	9,105	No	Laut Sawu	Candidate
IDN270	Perairan Tarimbang	East Nusa Tenggara	3,579	No	Laut Sawu	Candidate
IDN276	Pulau Salura–Mangkudu–Kotak	East Nusa Tenggara	4,904	PP	Laut Sawu	Confirmed
IDN278	Perairan Tanjung Ngunju	East Nusa Tenggara	6,403	PP	Laut Sawu	Candidate
IDN281	Perairan Komodo–Rinca	East Nusa Tenggara	124,748	Yes	Komodo–Selat Sumba	Confirmed
IDN295	Riung 17 Pulau	East Nusa Tenggara	23,314	Yes	No corridor	Confirmed
IDN299	Paga	East Nusa Tenggara	3,907	No	No corridor	Candidate
IDN301	Gunungsari	East Nusa Tenggara	593	No	No corridor	Candidate
IDN302	Teluk Maumere	East Nusa Tenggara	47,822	Yes	No corridor	Confirmed
IDN307	Pantai Selatan Lebau	East Nusa Tenggara	1,770	No	Solor–Alor	Candidate
IDN310	Flores Timur	East Nusa Tenggara	2,974	No*	Solor–Alor	Candidate
IDN311	Perairan Lembata	East Nusa Tenggara	37,527	No	Solor–Alor	Confirmed
IDN314	Selat Pantar	East Nusa Tenggara	55,071	PP	Solor–Alor	Confirmed
IDN316	Pantar Utara	East Nusa Tenggara	3,282	PP	Solor–Alor	Candidate
IDN318	Perairan Gunung Muna	East Nusa Tenggara	3,525	PP	Solor–Alor	confirmed
IDN320	Perairan Alor Utara	East Nusa Tenggara	5,417	PP	Solor–Alor	Candidate
IDN326	Kepulauan Kisar	Maluku	337,200	No	Busur Banda Dalam	Candidate
IDN328	Perairan Kepulauan Lemola	Maluku	133,061	No	Busur Banda Luar	Confirmed
IDN330	Kepulauan Sermatang	Maluku	197,741	No	Busur Banda Luar	Candidate
IDN331	Kepulauan Damar	Maluku	131,858	No	Busur Banda Dalam	Candidate
IDN333	Kepulauan Babar	Maluku	304,311	No	Busur Banda Luar	Candidate
IDN335	Perairan Angwarmase	Maluku	1,583	No	Busur Banda Luar	Confirmed
IDN337	Selat Yamdena	Maluku	38,263	No	Busur Banda Luar	Confirmed
IDN339	Kepulauan Larat–Fordata	Maluku	58,661	No	Busur Banda Luar	Confirmed
IDN348	Perairan Teluk Kupang	East Nusa Tenggara	79,114	PP	Laut Sawu	Confirmed
IDN351	Perairan Rote Utara	East Nusa		PP	Laut Sawu	Confirmed

Code	KBA Name	Province	Area (ha)	Protected Area	Marine Corridor	KBA status
		Tenggara	25,788			
IDN354	Rote Barat Daya	East Nusa Tenggara	53,884	PP	Laut Sawu	Confirmed
IDN355	Perairan Pulau Dana	East Nusa Tenggara	35,119	PP	Laut Sawu	Candidate

Table 4.21. Terrestrial KBAs Timor-Leste

Code	KBA Name	District	Area (ha)	Protected Area	Corridor
TLS001	Nino Konis Santana	Lautem	67,483	Yes	Timor–Wetar
TLS003	Nari	Lautem	3,076	No	Timor–Wetar
TLS005	Legumau	Baucau and Lautem	10,009	PP	Timor–Wetar
TLS006	Monte Matebian	Baucau	10,317	Yes	Timor–Wetar
TLS007	Irabere–Iliomar	Viqueque and Lautem	16,400	PP	Timor–Wetar
TLS009	Monte Builo	Viqueque	6,974	PP	Timor–Wetar
TLS010	Mundo Perdido	Baucau and Viqueque	25,899	Yes	Timor–Wetar
TLS013	Subaun	Dili and Manatuto	23,665	PP	Timor–Wetar
TLS014	Laleia	Manatuto	8,817	No	Timor–Wetar
TLS015	Monte Aitana–Bibileo	Viqueque	10,027	PP	Timor–Wetar
TLS016	Monte Diatuto	Manatuto; Manufahi; Aileu	37,486	PP	Timor–Wetar
TLS017	Monte Mak Fahik–Sarim	Manatuto	2,933	PP	Timor–Wetar
TLS018	Sungai Klere	Manufahi and Manatuto	41,868	PP	Timor–Wetar
TLS020	Monte Tatamailau	Ainaro, Aileu, and Ermera	30,245	Yes	Timor–Wetar
TLS021	Leimia Kraik	Ermera	2,853	No	Timor–Wetar
TLS022	Areia Branca no Dolok Oan	Dili	2,916	Yes	Timor–Wetar
TLS024	Atauro Island	Dili	14,184	Yes	Timor–Wetar
TLS027	Tasitolu	Dili	1,543	PP	Timor–Wetar
TLS028	Fatumasin	Liquica and Ermera	13,541	Yes	Timor–Wetar
TLS029	Maubara	Liquica	5,281	PP	Timor–Wetar
TLS032	Be Malae	Bobonara	27,832	PP	Timor–Wetar
TLS033	Tilomar	Covalima	5,348	Yes	Timor–Wetar
TLS035	Citrana	Oecussi	10,924	PP	Timor–Wetar

Table 4.22. Marine KBAs and Candidate KBAs in Timor-Leste

Code	KBA Name	Province	Area (ha)	Protected Area	Marine Corridor	KBA status
TLS002	Perairan Nino Konis Santana	Lautem	60,256	Yes	Timor-Leste Marine	Confirmed
TLS004	Raumoco	Lautem	2,036	No	Timor-Leste Marine	Confirmed
TLS008	Perairan Irabere–Iliomar	Viqueque and Lautem	2,489	No	Timor-Leste Marine	Candidate
TLS011	Kaibada	Baucau	571	No	Timor-Leste Marine	Confirmed
TLS012	Perairan Subaun	Dili and Manatuto	10,654	No	Timor-Leste Marine	Confirmed
TLS019	Perairan Sungai Klere	Manufahi and Manatuto	31,643	No	Timor-Leste Marine	Candidate
TLS023	Perairan Areia Branca no Dolok Oan	Dili	2,384	No	Timor-Leste Marine	Confirmed
TLS025	Perairan Atauro	Dili	10,542	No	Timor-Leste Marine	Confirmed
TLS026	Perairan Tasitolu	Dili	1,208	No	Timor-Leste Marine	Confirmed
TLS030	Perairan Maubara	Liquica	3,624	No	Timor-Leste Marine	Candidate
TLS031	Perairan Be Malae	Bobonara	2,945	No	Timor-Leste Marine	Candidate
TLS034	Perairan Tilomar	Covalima	1,200	No	Timor-Leste Marine	Candidate

4.2.3 Corridor Outcomes

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 between KBAs (Section 4.2). Of 308 terrestrial globally threatened species, 26 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. Ten landscape corridors were defined covering large, relatively contiguous areas of habitat where these species occur. In practice, the corridors cover most of the remaining forest in the large islands of the hotspot. The definition of corridor boundaries used ecological (primarily forest) boundaries where possible, but are necessarily approximate. Table 4.23 lists the species and the corridors where they occur.

Figure 4.8. Map of Terrestrial and Marine Corridors in Wallacea

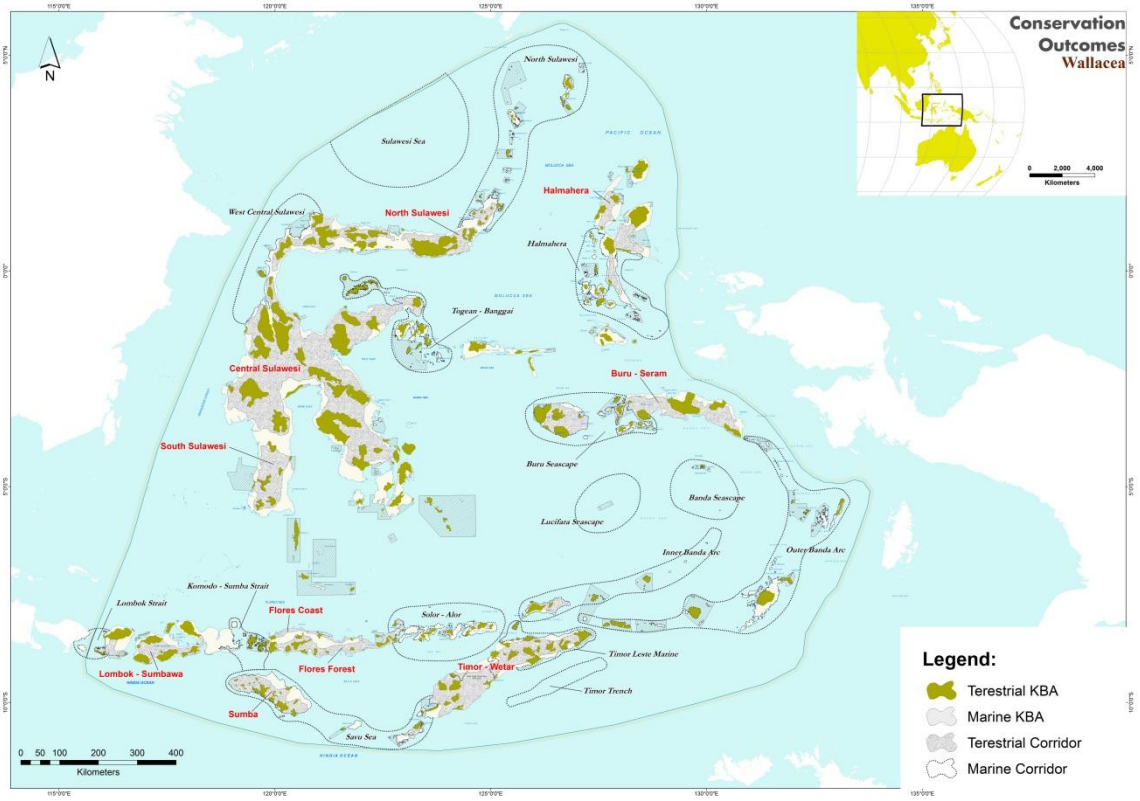


Table 4.23. Occurrence of Landscape Species in Corridors

Scientific Name	Common Name		Halmahera	Seram-Buru	Sumba	Sumbawa-Lombok	Timor-Wetar	Flores Forests	Flores Coast	North Sulawesi	Central Sulawesi	South Sulawesi
Aceros cassidix	Knobbed hornbill	VU								x	x	x
Aceros everetti	Sumba hornbill	VU			x							
Cacatua alba	White cockatoo	VU	x									
Cacatua moluccensis	Salmon-crested cockatoo	VU		x								
Cacatua sulphurea	Yellow-crested cockatoo	CR			x		x	x				
Ducula cineracea	Timor imperial pigeon	EN										
Eulipoa wallacei	Molucan megapode	VU	x									
Macrocephalon maleo	Maleo	EN								x	x	
Nisaetus floris	Flores hawk-eagle	CR				x		x				
Penelopides exarhatus	Sulawesi hornbill	VU								x	x	x

Scientific Name	Common Name		Halmahera	Seram-Buru	Sumba	Sumbawa-Lombok	Timor-Wetar	Flores Forests	Flores Coast	North Sulawesi	Central Sulawesi	South Sulawesi
Ptilinopus dohertyi	Red-naped fruit-dove	VU			x							
Treron floris	Flores green-pigeon	VU				x		x				
Treron psittaceus	Timor green-pigeon	EN					x					
Acerodon mackloti	Lesser Sunda flying-fox	VU						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
Harpyionycteris celebensis	Sulawesi harpy fruit-bat	VU								x	x	x
Macrogalidia musschenbroekii	Sulawesi palm civet	VU								x	x	x
Nyctimene minutus	Lesser tube-nosed bat	VU		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								
Strigocuscus celebensis	Small Sulawesi cuscus	VU								x	x	x
Syconycteris carolinae	Halmahera blossom-bat	VU	x									
Varanus komodoensis	Komodo dragon	VU							x			

Three of the terrestrial corridors — North, Central and South Sulawesi — have the largest number of landscape species but share most of these species in common. Ranking of corridors based on species numbers was, therefore, not effective. Instead, a complementarity approach was used, starting with the corridor with the largest number of species (South Sulawesi); next was the second rank allocated to the site that added the greatest number of additional species, in this case Seram-Buru. All the landscape species are covered by only the first five corridors. The remaining corridors thus form a second layer of priority that contributes additional locations for corridor species (Table 4.24).

Table 4.24. Terrestrial Corridors with Ranking

Corridor	Province/Country	Area (ha)	# CR Species	# EN Species	# VU Species	Rank
Halmahera	North Maluku	691,328	0	0	3	4
Seram-Buru	Maluku	1,427,848	0	1	4	2
Sumba	East Nusa Tenggara	662,795	1	0	2	5
Sumbawa-Lombok	West Nusa Tenggara	475,605	1	0	1	

Corridor	Province/Country	Area (ha)	# CR Species	# EN Species	# VU Species	Rank
Timor-Wetar	West Nusa Tenggara / Timor-Leste	1,902,524	1	1	0	5
Flores Forests	East Nusa Tenggara	685,928	2	1	2	3
Flores Coast	East Nusa Tenggara	179,880	0	0	1	7
North Sulawesi	North Sulawesi, Gorontalo	1,279,252	0	3	6	
Central Sulawesi	West Sulawesi, Central Sulawesi, South Sulawesi, Southeast Sulawesi	6,243,989	0	3	6	1
Southern Sulawesi	South Sulawesi	879,949	0	2	6	

Marine corridors encompass an area that is important for groups of wide-ranging or migratory species, or for critical ecological processes, such as spawning grounds. They were defined based on inputs from marine experts, and their boundaries are approximations of the limits of the conservation value contained by the corridor. Sixteen corridors were defined (Table 4.25).

Species records from the KBAs within each corridor were compiled to investigate the possibility of ranking corridors on the basis of biological importance; however, ranking using species records was unsatisfactory because relatively detailed surveys are only available in four corridors — North Sulawesi, Timor-Leste, Banda Sea and Halmahera. These corridors are known to have between 60 and 140 of the globally threatened marine species (Table 4.25). The absence of species-level survey work in other corridors means that very few globally threatened species have been recorded there. To allow a tentative ranking of corridors, hypothetical records of globally threatened species were assigned to corridors based on information about species range and habitat requirements. Many of the globally threatened marine species are believed to occur across Wallacea, and to occur in habitats (such as coral reefs) that are widespread. They are, therefore, assumed to occur in all corridors; however, a number of species have more restricted ranges, or are specialists in habitats that do not occur in all corridors. These species are assumed to occur only in a subset of corridors, and as a result, there are differences in the total hypothetical species richness of the corridors that can be used as a tentative basis for biological ranking.

The results (Table 4.25) suggest that the North Sulawesi and Halmahera marine corridors are of highest biological priority, while the others are almost equal in species richness. Two corridors, Timor Trench and Sulawesi Sea, do not have coral reef or other near-shore habitats and so are assumed to have a far smaller complement of globally threatened species. These corridors were identified because of their importance for pelagic fish and whales.

Table 4.25. Marine Corridors with Hypothetical and Recorded Total Numbers of Globally Threatened Species

Corridor Name	Hypothetical Total # of Globally Threatened Species	# of Globally Threatened Species with Confirmed Records
Sulawesi Utara	440	209
Perairan Halmahera	294	64
Timor-Leste Marine	312	90
Barat Sulawesi Tengah	225	1
Togean–Banggai	226	4
Laut Sawu	227	3
Solor–Alor	224	2
Busur Banda Luar	226	4
Selat Lombok	226	4
Komodo–Selat Sumba	225	4
Bentang Laut Banda	294	76
Bentang Laut Buru	219	0
Busur Banda Dalam	218	0
Bentang Laut Lucipara	218	1
Laut Sulawesi	25	0
Palung Timor	25	0

4.3 Link to CEPF Monitoring Framework and Long-Term Goals

Species data is relevant to **Goal 1, Criterion 1** (globally threatened species) of the long-term goals. As noted in the above section on the limitations of the methodology and improving the analysis, many of the known species in Wallacea have not been assessed against the Red List criteria.

Species data is also relevant to **Goal 5, Criterion 1** (biodiversity monitoring) of the long-term goals. In Indonesia, 14 species are considered priorities by the Forest Protection and Nature Conservation Directorate of the Ministry of Forestry.[6] The ministry has established a target that the populations of the these species should increase by 3 percent between 2010 and 2014, and National Park Management Units and Natural Resource Conservation Agencies (KSDA) where these species occur are expected to make efforts to monitor the populations of the species. Six of them are found in Wallacea (Table 4.26). Outside of this, however, there is no regular monitoring of species or habitats.

[6] Decision of the Director-General of Forest Protection and Nature Conservation No. 132/2011.

Table 4.26. Priority Species for Monitoring and Conservation Action Identifed by the Government of Indonesia

Species Name	Corridors	# of KBAs
Komodo (*Varanus komodoensis*)	Flores Coast	7
Mountain anoa (*Bubalus quarlesi*)	Central Sulawesi, North Sulawesi	13
Lowland anoa *(Bubalus depressicornis*)	Central Sulawesi, North Sulawesi	22
Buru babirusa (*Babyrousa babyrussa*)	Seram-Buru	2
Maleo (*Macrocephalon maleo*)	Central Sulawesi, North Sulawesi	27
Yellow-crested cockatoo (*Cacatua sulphurea*)	Flores Forests, Timor-Wetar, Sumba	88

Species data is also required for the monitoring of **Indicator 1** in the CEPF monitoring framework. The Red List status of all species listed as such on Nov. 30, 2013, is documented in Annex 1.

Indicator 2 in the CEPF monitoring framework refers to the conservation status of specific species likely to benefit from CEPF support. Section 4.3.2 identified species that are priorities for species-focused action, and Table 12.1 in Chapter 12 further refines this list to propose species that will be a priority for CEPF support. These are the ones that should, where possible, be monitored. They are:

Scientific Name	Species Group	IUCN Red List Status
Cacatua sulphurea	Bird	CR
Chelodina mccordi	Reptile	CR
Leucocephalon yuwonoi	Reptile	CR
Macaca nigra	Mammal	CR
Macrocephalus maleo	Bird	EN
Eos histrio	Bird	EN
Ornithoptera aesacus	Lepidoptera	VU
Cheilinus undulatus	Marine fish	EN
Cacatua alba	Bird	VU
Lorius garrulus	Bird	VU
Eretmochelys imbricata	Reptiles	CR
Caretta caretta	Reptiles	EN
Chelonia mydas	Reptiles	EN
Dermochelys coriacea	Reptiles	VU
Lepidochelys olivacea	Reptiles	VU
Dugong dugon	Marine mammals	VU
Manta alfredi	Marine fish	VU
Manta birostris	Marine fish	VU
Coral spp (176 spp)	Coral	EN (9) VU (167)

KBA site data is relevant to **Goal 1, Criterion 2** (key biodiversity areas) of the long-term goals. In monitoring this criteria, it is important to note that this analysis fulfills the criterion in that it identifies KBAs based on the available data. The list of KBAs, however, will be extended and refined as more data becomes available, and fulfilment of this criteria should take into account the need to update the KBA analysis.

Information on the management of KBAs is relevant for the assessment of **Goal 1, Criterion 5** (management best practices) of the long-term goals and **Indicator 19** of the CEPF monitoring framework. There is no systematic data on the management of KBAs that allows the identification of best practices in an objective way. Based on available information, projects offering examples of best practices within specific situations include YANI's work at Nantu (Gorontalo) on community engagement and law enforcement, Burung Indonesia's work negotiating agreement on national park boundaries in Sumba, land purchases to protect Maleo nesting areas by Wildlife Conservation Society in Sulawesi, conservation land purchases and small-scale community-based ecotourism run by the Sawai Ekowisata Foundation on Halmahera, and community-based forest management to preserve plant dyes for traditional cloth by Threads of Life in Flores. Some formal protected areas also show innovative approaches, such as the widespread use of community conservation agreements around Lore Lindu; however, the total number of KBAs in Wallacea with active, successful examples of best practices is probably fewer than 20.

Land cover data for sites is also relevant for **Indicator 3** in the CEPF monitoring framework. The figures for forest and nonforest cover in each KBA in Indonesia are given in Annex 2. The analysis uses the Ministry of Forestry Land Cover Map (*Peta Tutupan Lahan*) issued in 2011. The area of forest cover combines the six categories of forest (Table 4.27). All other categories of land cover are treated as nonforest.

Table 4.27. Forest Land Cover Categories Combined to Derive Area of Forest Cover in KBAs

Category Name	Ministry of Forestry Land Cover Code	Ministry of Forestry Land Cover Number
Primary dryland forest	2001	Hp
Secondary dryland forest	2002	Hs
Primary mangrove forest	2004	Hmp
Secondary mangrove forest	20041	Hms
Primary swamp forest	2005	Hrp
Secondary swamp forest	20051	Hrs

Corridor data is relevant to **Goal 1, Criterion 3** (conservation corridors) of the long-term goals and to **Indicator 8** of the CEPF monitoring framework. The basis for analysis that corridors cover all the relevant biomes is a comparison of the definition of corridors with the WWF terrestrial ecoregional analysis for Wallacea and the Marine Ecoregions of the World analysis, summarized in tables 4.27 and 4.28.

Table 4.27. Comparison of Terrestrial Corridors with Ecoregions (WWF)

WWF Terrestrial Ecoregion	Corridors Covering Contiguous Habitat in the Ecoregion
Banda Sea islands moist broadleaf forests	None (limited areas of contiguous habitat but covered by Banda Islands KBA)
Buru rain forests	Seram–Buru
Seram rain forests	Seram–Buru
Halmahera rain forests	Halmahera
Sulawesi lowland rain forests	North Sulawesi, Central Sulawesi, South Sulawesi
Sulawesi montane rain forests	North Sulawesi, Central Sulawesi, South Sulawesi
Lesser Sundas deciduous forests	Flores Forests, Flores Coast, Sumbawa-Lombok
Sumba deciduous forests	Sumba
Timor and Wetar deciduous forests	Timor-Wetar

Table 4.28. Comparison of Marine Corridors with Marine Ecoregions

Marine Ecoregions of the World	Marine Corridors in the Ecoregion
Sulawesi Sea/Maskassar Strait	Laut Sulawesi
	Barat Sulawesi Tengah
	Sulawesi Utara
Lesser Sunda	Palung Timor
	Timor-Leste Marine
	Solor–Alor
	Laut Sawu
	Komodo–Selat Sumba
	Selat Lombok
Banda Sea	Bentang Laut Banda
	Bentang Laut Buru
	Bentang Laut Lucipara
	Busur Banda Dalam
	Busur Banda Luar
	Togean–Banggai (Banggai section)
Tomini	Togean–Banggai (Togean section)
Halmahera	Perairan Halmahera

Data on the total area of KBAs under formal protection is relevant to **Indicator 5** of the CEPF monitoring framework (change in the number of hectares of new protected areas). Table 4.13 shows that in Indonesia 27 percent of the areas of terrestrial KBAs is within protected areas, 33 percent in watershed protection forest, 26 percent in other types of state forest, and 14 percent outside state forests. As of January 2014, proposals are known for the upgrading of two sites: Mambuliling (KBA IDN126, West Sulawesi, 265,951 hectares) to become Ganda Dewata National Park, and Mekongga (KBA IDN101, Southeast Sulawesi) also as a national park. Three KBAs in Lesser Sundas have long been proposed as national parks: Gunung Tambora on Sumbawa (IDN246, 106,257 hectares, West Nusa Tenggara) and Gunung Mutis and Gunung Timau on Timor (IDN341, 52,788 hectares + IDN346, 36,150 hectares, East Nusa Tenggara). These proposals, however, appear to have been stalled by local opposition and competing interests.

Indicator 6 of the CEPF monitoring framework requires a baseline list of sites that are likely to benefit from CEPF support and should be monitored for change in threat level.

For terrestrial KBAs, those that are in priority clusters (see Chapter 12) *and* on the list of 50 sites in the complementary network produce a list of 22 KBAs for threat monitoring.

KBA Code	KBA Name	Area (ha)	Bioregion	Protection Status
IDN003	Karakelang Utara	32,242	Sulawesi	Partially protected
IDN012	Gunung Sahendaruman	4,392	Sulawesi	Unprotected
IDN015	Pulau Siau	11,662	Sulawesi	Unprotected
IDN073	Danau Poso	69,079	Sulawesi	Partially protected
IDN095	Feruhumpenai–Matano	142,903	Sulawesi	Partially protected
IDN096	Danau Mahalona	5,171	Sulawesi	Partially protected
IDN097	Danau Towuti	96,662	Sulawesi	Partially protected
IDN130	Danau Tempe	32,024	Sulawesi	Unprotected
IDN134	Bantimurung Bulusaraung	47,846	Sulawesi	Protected
IDN138	Karaeng–Lompobattang	32,814	Sulawesi	Partially protected
IDN145	Morotai	239,680	Maluku	Unprotected
IDN156	Kao	4,911	Maluku	Unprotected
IDN163	Ternate	9,080	Maluku	Unprotected
IDN165	Aketajawe	168,083	Maluku	Protected
IDN172	Yaba	20,158	Maluku	Unprotected
IDN199	Pulau Buano	13,616	Maluku	Unprotected
IDN212	Manusela	248,077	Maluku	Partially protected
IDN280	Komodo–Rinca	61,698	Lesser Sundas	Protected
IDN284	Mbeliling–Tanjung Kerita Mese	33,549	Lesser Sundas	Unprotected
IDN288	Ruteng	40,744	Lesser Sundas	Partially protected
TLS001	Nino Konis Santana	67,483	Lesser Sundas	Protected
TLS010	Mundo Perdido	25,899	Lesser Sundas	Protected

There are 53 marine KBAs within the five priority marine corridors. At this stage, there is no method to prioritize between these KBAs, but it is suggested that threat monitoring should be carried out at a subset of sites chosen to represent the corridors and protected–nonprotected status.

KBA Code	KBA Name	Area (ha)	Bioregion	Protection Status
IDN001	Kepulauan Nanusa	33,439	Sulawesi	Unprotected
IDN002	Perairan Karakelang Utara	32,434	Sulawesi	Unprotected
IDN006	Perairan Talaud Selatan	47,250	Sulawesi	Unprotected
IDN008	Kawaluso	342,413	Sulawesi	Unprotected
IDN009	Perairan Sangihe	132,752	Sulawesi	Unprotected
IDN013	Mahangetang	33,683	Sulawesi	Unprotected
IDN014	Perairan Siau	77,152	Sulawesi	Unprotected
IDN016	Perairan Tagulandang	21,793	Sulawesi	Unprotected
IDN017	Perairan Biaro	16,946	Sulawesi	Unprotected
IDN018	Perairan Likupang	55,690	Sulawesi	Unprotected
IDN020	Molaswori	55,559	Sulawesi	Protected
IDN023	Selat Lembeh	17,589	Sulawesi	Unprotected
IDN026	Tulaun Lalumpe	1,392	Sulawesi	Unprotected
IDN032	Perairan Arakan Wawontulap	15,134	Sulawesi	Partially protected
IDN033	Amurang	24,347	Sulawesi	Protected
IDN077	Perairan Kepulauan Togean	341,275	Sulawesi	Protected
IDN079	Perairan Pagimana	1,071	Sulawesi	Unprotected
IDN081	Perairan Peleng–Banggai	509,722	Sulawesi	Partially protected
IDN087	Perairan Balantak	6,218	Sulawesi	Unprotected
IDN146	Pulau-pulau Pesisir Morotai	62,790	Maluku	Unprotected
IDN148	Loloda	14,635	Maluku	Unprotected
IDN151	Pulau–Pulau pesisir Tobelo	20,059	Maluku	Unprotected
IDN152	Jara-jara	6,910	Maluku	Unprotected
IDN155	Teluk Wasile	20,997	Maluku	Unprotected
IDN157	Teluk Buli	152,228	Maluku	Unprotected
IDN159	Tanjung Bobo	1,174	Maluku	Unprotected
IDN162	Ternate–Hiri	6,216	Maluku	Unprotected
IDN166	Weda Telope	8,880	Maluku	Unprotected
IDN168	Perairan Dote-Kobe	14,938	Maluku	Unprotected
IDN169	Kayoa	126,294	Maluku	Unprotected
IDN175	Kepulauan Widi	41,017	Maluku	Unprotected
IDN176	Libobo	686	Maluku	Unprotected
IDN180	Perairan Mandioli	17,636	Maluku	Unprotected
IDN190	Jorongga	65,154	Maluku	Unprotected
IDN307	Pantai Selatan Lebau	1,770	Lesser Sundas	Unprotected
IDN310	Flores Timur	2,974	Lesser Sundas	Proposed protected
IDN311	Perairan Lembata	37,527	Lesser Sundas	Unprotected
IDN314	Selat Pantar	55,071	Lesser Sundas	Partially protected
IDN316	Pantar Utara	3,282	Lesser Sundas	Partially protected
IDN318	Perairan Gunung Muna	3,525	Lesser Sundas	Partially protected

IDN320	Perairan Alor Utara	5,417	Lesser Sundas	Partially protected
TLS002	Perairan Nino Konis Santana	60,256	Lesser Sundas	Protected
TLS004	Raumoco	2,036	Lesser Sundas	Unprotected
TLS008	Perairan Irabere–Iliomar	2,489	Lesser Sundas	Unprotected
TLS011	Kaibada	571	Lesser Sundas	Unprotected
TLS012	Perairan Subaun	10,654	Lesser Sundas	Unprotected
TLS019	Perairan Sungai Klere	31,643	Lesser Sundas	Unprotected
TLS023	Perairan Areia Branca no Dolok Oan	2,384	Lesser Sundas	Unprotected
TLS025	Perairan Atauro	10,542	Lesser Sundas	Unprotected
TLS026	Perairan Tasitolu	1,208	Lesser Sundas	Unprotected
TLS030	Perairan Maubara	3,624	Lesser Sundas	Unprotected
TLS031	Perairan Be Malae	2,945	Lesser Sundas	Unprotected
TLS034	Perairan Tilomar	1,200	Lesser Sundas	Unprotected

Indicator 7 of the CEPF monitoring framework requires measurement of the vegetation within corridors. This has not been carried out, but the boundaries of corridors have been defined and Burung Indonesia has prepared these as GIS compatible Shape (SHP) files are supplied as SHP files.

Indicator 18 of the CEPF monitoring framework requires data from the GEF Management Effectiveness Tracking Tool (METT) scoring of protected areas. METT scoring has been carried out for national parks in the hotspot, but the results were not available at the time of this writing.

5. SOCIOECONOMIC CONTEXT OF THE HOTSPOT

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 economic growth rate of Indonesian Wallacea averaged 7.2 percent in 2012, and that of Timor-Leste 2.4 percent in 2011, with poverty rates of 16.97 percent and 28 percent, respectively.

5.1 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 East Nusa Tenggara, the social and economic indicators give some reasons for optimism. Economic development, however, is relying on the 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.

5.1.1 Social and Demographic Trends

5.1.1.1 Regional Demographics

The population of Indonesian Wallacea was 29,102,349 in 2010, making up only 12 percent of the total Indonesian population but showing an increase from 23,340,084 in 2000 (Table 5.1). Population density is 2.11 persons per square kilometer, lower than the national average. 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 2010).

Population density varies greatly by island (Table 5.1). The highest in Wallacea is in West Nusa Tenggara, at 230 persons per square kilometer, concentrated on the two largest islands, Lombok and Sumbawa. In East Nusa Tenggara population density is 98

people per square kilometer, but local population densities vary from less than 20 people per square kilometer in the driest areas, such as in East Sumba and Eastern Flores, to about 140 people per square kilometer 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 and south, reflecting the presence of two of eastern Indonesia's most important urban centers, Manado and Makassar. Maluku has the smallest population of all the subregions in the hotspot. Its highest population density is in Ambon, with 879 people per square kilometer, while the lowest, 10 people per square kilometer, is found in Southwest Maluku (Maluku in Figures 2012).

The annual population growth rate in the hotspot is 2.40 percent versus 1.49 percent for Indonesia as a whole. The population continues to grow in all provinces, with highest growth rates in Maluku and North Maluku (approximately 2.65 percent per year), and the lowest in North Sulawesi (1.26 percent per year) and South Sulawesi (1.17 percent per year).

Table 5.1. Basic Population Statistics for the Wallacea Hotspot in Indonesia (2010)

Province	Population	Population Density (ppl per km^2)	% Annual Population Growth (2000–2010)
North Sulawesi	2,265,937	160	1.26
Gorontalo	1,038,585	85	2.24
Central Sulawesi	2,633,420	43	1.94
West Sulawesi	1,158,336	69	2.67
South Sulawesi	8,032,551	170	1.17
South East Sulawesi	2,230,569	58	2.07
West Nusa Tenggara	4,496,855	230	1.17
East Nusa Tenggara	4,679,316	98	2.06
North Maluku	1,035,378	23	2.44
Maluku	1,531,402	33	2.78
Total Wallacea	29,102,349	73.9	2.40
Total Indonesia	237,556,363	127	1.49

Source: Hasil, Sensus, Penduduk (2010); Data Agregat per Provinsi. Badan Pusat Statisika, www.bps.go.id/65tahun/SP2010_agregat_data_perProvinsi.pdf, accessed August 29, 2013.

5.1.1.2 Employment, Migration and Urbanization

The urbanization rate in Indonesia, where rural residents are free to move to urban areas, has accelerated dramatically in recent years. It took the country 40 years, from 1950 to 1990, to double the share of population living in urban areas from 15 percent to 30 percent. Twenty years later that figure is now 44 percent. Wallacea is also slowly urbanizing following the national trends with North Sulawesi and West Nusa Tenggara the two most urbanized regions (Table 5.4).

Table 5.42. Percentage of Population in Urban Areas by Province 2010

Province	2010

North Sulawesi	37.0
Gorontalo	25.5
Central Sulawesi	19.7
West Sulawesi	N/A*
South Sulawesi	29.4
South East Sulawesi	20.8
West Nusa Tenggara	34.8
East Nusa Tenggara	15.9
North Maluku	29.5
Maluku	25.9

*: West Sulawesi is combined with South Sulawesi.
Source: Badan Pusat Statisika (2010).

Throughout Indonesian Wallacea, migration has occurred for a number of reasons: economic factors, availability of job opportunities, higher income, better social infrastructure and services, such as schools and health care, and then there are the government sponsored programs, such as the transmigration program that moved people from Java and Bali to Sulawesi and the Maluku during the 1980s and 1990s.

On the other hand, there are people who migrate involuntarily. Natural or human-made disasters, conflict, situations of general violence, violations of human rights, and displacement caused by development projects — among others, mining projects, palm oil plantations and irrigation projects — are factors that force people to leave their homes. Wallacea had its share of internal displacement as ethnic and religious violence gripped a number of regions, especially in the 1999–2002 period (Internal Displacement Monitoring Centre 2009). North Sulawesi saw an influx of migrants from Maluku and Central Sulawesi escaping the violence in those two regions.

Throughout the hotspot, the urban centers are a magnet for recent migrants from within the province or from other parts of the country. In contrast, the rural areas have attracted recent migrants but not on a scale of the urban areas. In North Sulawesi, the 2010 population census recorded 110,200 people or 5.3 percent of the population as recent migrants. The highest numbers of inter-district/municipality migrants are in Manado. The same pattern is found in West Nusa Tenggara where 115,652 people or 2.9 percent of the population are recent migrants and the majority of them are in Mataram. In Maluku, the 2010 population census recorded 72,044 people or 5.4 percent of the population as recent interprovincial migrants with the highest number of migrants in Ambon. In NTT 137,006 people or 3.4 percent of the population are recent inter-provincial migrants with the highest number of inter-district/municipality migrants in Kupang (BPS 2010).

5.1.1.3 Poverty and Human Development

There are great disparities in wealth and human well-being across Wallacea. Although there has been an absolute decrease in the number of poor living in Wallacea since 2009, the percentage of poor people living in rural areas is still above the national average (Table 5.5). The rate of poverty in Sulawesi's provinces is still higher than the national average with the exception of North and South Sulawesi. Maluku has the highest percentage of poor people living in rural areas (28 percent) but it is East Nusa Tenggara

which has the highest absolute number of poor people living in rural areas (1,000,300). When it comes to low human development and high poverty levels, East Nusa Tenggara is usually near the top of the list. All but one of East Nusa Tenggara's districts are defined as poor (Kelen and Daslani 2012).

Table 5.5. Number and Percentage of Poor People by Province in the Hotspot 2009-2012

	Number of Poor People (individuals)		Rural Poverty (poor people as % of total rural population)	
Province	**2009**	**2012**	**2009**	**2012**
Central Sulawesi	432,070	409,600	20.26	16.85
East Nusa Tenggara	1,014,100	1,003,000	25.10	22.41
Gorontalo	209,900	187,700	30.89	23.63
Maluku	378,600	338,900	33.94	28.12
North Maluku	91,100	88,300	12.28	9.98
North Sulawesi	206,700	177,500	10.14	8.69
South East Sulawesi	400,700	304,300	20.92	16.24
South Sulawesi	913,400	805,900	14.88	12.93
West Nusa Tenggara	1,050,900	828,330	23.31	18.02
West Sulawesi	141,300	160,600	15.52	13.92
Wallacea	4,838,770	4,304,130	20.72	17.07
Indonesia	31,023,400	28,594,600	16.56	14.70

Source: BPS (2012).

Meanwhile, the Human Development Index (HDI) indicates a significant improvement over 1996 figures, but still, for the most part, the provinces in the hotspot lag behind provinces in other parts of the country. All of the provinces in Sulawesi show an improvement in the HDI, Gender Development Index, life expectancy and the number of years in school (Table 5.6). But if we compare among the provinces the HDI varies due to the lack of basic services and poor quality of services in the rural and isolated areas. There are 33 districts in Sulawesi that are classified as "tertinggal" (backward/under-developed) (Bappenas 2012). This same pattern is found in the Maluku and Nusa Tenggara, where services are poor in the rural and isolated areas. Educational levels are of particular concern. While the number of years students are staying in school has improved, it is still low, indicating that the quality of human resources by formal education is relatively low.

Table 5.6. Human Development Index and Other Key Indicators by Province in the Hotspot

Province	Human Development Index (2010)	Gender Development Index (2010)	Life Expectancy in Years	Number of Years in School (2009)
North Sulawesi	76.09 (2)	71.05	74.90	8.80
Gorontalo	70.28 (24)	55.67	74.90	7.20
Central Sulawesi	71.14 (22)	65.37	68.90	7.90
West Sulawesi	69.64 (27)	63.15	70.80	7.10
South Sulawesi	71.62 (19)	62.46	70.80	7.40
Southeast Sulawesi	70.00 (25)	63.87	70.40	7.90
West Nusa Tenggara	65.20 (32)	56.02	67.0	6.6
East Nusa Tenggara	67.36 (31)	64.61	69.9	6.6
North Maluku	69.03 (30)	64.41	69.2	8.2
Maluku	71.42 (20)	67.23	69.6	8.6

Province	Human Development Index (2010)	Gender Development Index (2010)	Life Expectancy in Years	Number of Years in School (2009)
National Average	-	67.80	71.05	11

Note: number in brackets show the rank of the province among 35 provinces nationally.
Source: Compiled from Government Work Plans (RKP), Bappenas (2012); BPS (2010).

5.1.1.4 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 are instead a complex mixture of large numbers of groups spread across the region (Aspinall 2010). East Nusa Tenggara 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 5.7).

Wallacea's interaction with numerous cultures over the ages — Indian, Chinese, Melanesian/Polynesian, Portuguese, Arabian, English and Dutch — has resulted in a 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 regions except North Sulawesi and East Nusa Tenggara, where Christianity predominates (Table 5.2). Although most people identify themselves as Muslims or Christians, they often subscribe to local beliefs and deities as well.

Table 5.7. Ethnicity, Religions and Languages in Wallacea

Province	Major Ethnic Groups	Majority Religion	Other Religions	Local Languages
North Sulawesi	Minahasa	Christian, Catholic	Islam, Hindu, Buddhist	Minahasa, Manado
Gorontalo	Gorontaloan, Mongondow	Islam	Protestant, Hindu, Buddhist	Gorontalo
Central Sulawesi	Butung, Kaili, Bugis, Tolaki, Gorontaloan	Islam	Protestant	Butung, Kaili, Bugis, Tolaki, Gorontaloan
West Sulawesi	Mandar	Islam	Protestant, Hindu, Roman Catholic	Mandar, Toraja, Bugis, Makassar
South Sulawesi	Bugis, Makassar, Toraja	Islam	Protestant, Catholic, Buddhist	Bugis, Makassar, Toraja,
South East Sulawesi	Buton, Bugis, Tolaki, Muna	Islam	Christian, Hindu	Buton, Bugis
West Nusa Tenggara	Sasak, Bima, Sumbawa, Indian, Balinese	Islam	Hindu, Buddhist	Sasak, Balinese,
East Nusa Tenggara	Atoni, Manggarai, Sumba, Belu, Lamaholot, Rote, Lio	Protestant, Roman Catholic	Islam	Kambera, Anakalangu, Manggarai, Riung
North Maluku	Melanesian, Kei, Ambonese, Buton, Malays, Javanese, Chinese	Islam	Protestant, Roman Catholic	Ternate

Province	Major Ethnic Groups	Majority Religion	Other Religions	Local Languages
Maluku	Melanesian, Kei, Ambonese, Buton, Malays, Javenese, Chinese	Islam, Protestant	Roman Catholic, Hindu	Kei, Buton, Ambon

Source: Compiled from Badan Pusat Statisika (2010).

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 hot spots 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). The Lamalera people in Lembata islands are the only community in Indonesia with customary law (*adat*) regarding whale hunting as part of a traditional subsistence fishery. One of the most well known and intensely studied traditional resource management systems is an indigenous fisheries resource conservation and management tradition in Maluku known as Sasi. Although Sasi has transformed with time and its scope differs from location to location, studies indicate that marine Sasi can be used as a basis for building local level natural resource management institutions (Novaczek *et al.* 2001, Zerner 1994).

5.1.1.5 Livelihoods in Indonesian Wallacea

The range of livelihoods in Wallacea is diverse, from the 1.3 million urban dwellers in the economic capital of Makassar, to hunter-gatherers in the depths of the forests of Halmahera and Seram. As noted in Section 5.1.4, the majority of the population in Wallacea is still rural based and depends 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 (Fox 2000, Southon 1995, Stacey 1999, 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 degraded by the modernism and urban consumerism, amidst the fact that these communities are struggling to maintain their traditional knowledge system and ecological heritage established from centuries ago by their ancestors. Local ethnic groups across the archipelago have been practicing and maintaining these traditional knowledge systems including customary marine tenure, despite the lack of legal recognition from the state (Thorburn 2000).

5.1.2 Economic Context

5.1.2.1 Economic Trends in Indonesian Wallacea

As Table 5.8 indicates, economic growth in Wallacea averaged 7.2 percent between 2010 and 2012, consistently higher than the national average of 6.2 percent in those same years. All the provinces in Sulawesi have enjoyed strong economic growth rates over the past few years with Gorontalo and West Sulawesi leading the way. At the other end of the spectrum are East and West Nusa Tenggara. In 2011, West Nusa Tenggara experienced negative growth rate due to a contraction in the mining and quarrying sector. Although Wallacea's growth rates are high, this region's contribution to the national gross domestic product (GDP) is still quite low. In 2012, Sulawesi's contribution to the national GDP was only 4.81 percent, in contrast to Java's 58.15 percent.

Table 5.8. Economic Growth Rates in Indonesian Wallacea, 2010–2012

Province	Growth Rate 2010 (%)	Growth Rate 2011 (%)	Growth Rate 2012 (%)
North Sulawesi	7.12	7.39	7.86
Gorontalo	11.91	7.68	7.71
Central Sulawesi	7.62	9.17	9.27
West Sulawesi	8.19	11.9	12.9
South Sulawesi	6.29	7.65	8.30
Southeast Sulawesi	8.18	8.45	10.4
West Nusa Tenggara	6.29	-3.2	5.7
East Nusa Tenggara	5.13	5.6	5.4
North Maluku	7.96	6.4	6.6
Maluku	6.47	6.0	7.8
Wallacea	7.6	6.7	7.2
Indonesia	6.1	6.3	6.4

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

The sector that has contributed the most to the economic growth in Sulawesi is agriculture, at 30.20 percent; trade, hotel and restaurants add 16.4 percent; and the service sector is at 13.74 percent. In Nusa Tenggara, similar to Sulawesi, the agricultural sector contributes 30.42 percent, the service sector 16.42 percent, and trade and restaurant 15.87 percent. In North Maluku and Maluku, the economic growth rates are lower for the most part. Agriculture is the largest contributor to the GDP at 33 percent, followed by trade at 26 percent, the service sector at 14 percent and manufacturing at 8 percent (Maluku in Figures 2012).

5.1.2.2 Regional Development in Indonesian Wallacea

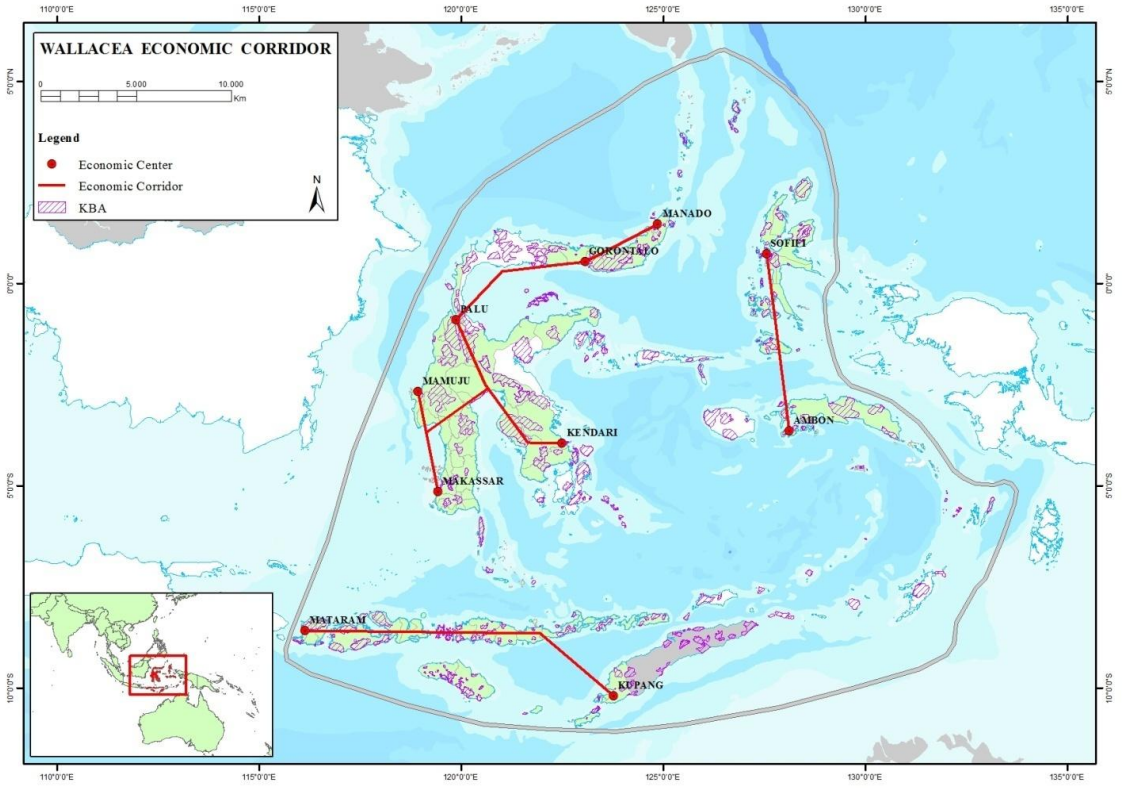
Indonesia seeks to be one of the 10 major economies in the world by 2025 with an expected per capita income of $14,250 to $15,500 and a total GDP of $4.0–4.5 trillion. To achieve this, however, real economic growth must reach 7 percent to 9 percent per year, on an ongoing basis. In 2011 the Government of India developed The Masterplan for the Acceleration and Expansion of Economic Development of Indonesia (MP3EI), which presents the building blocks for achieving the 2025 vision (Coordinating Ministry for Economic Affairs 2011).

Of particular importance is MP3EI's plan for accelerating economic development in three economic corridors that overlap with the Wallacea region: the Sulawesi Economic Corridor, as a center for production and processing of national agricultural, plantation, fishery, oil and gas, and mining; Bali–Nusa Tenggara Economic Corridor as a gateway for tourism and national food support; Papua–Maluku Island Economic Corridor as a center for the development of food, fisheries, energy and national mining.

The total new investment plans for the main economic activities in Sulawesi Economic Corridor as well as for the supporting required infrastructure is approximately $3 billion. The majority of the investment plan is related to nickel mining. New investment plans for the main economic activities of tourism, fisheries, animal husbandry and the supporting infrastructure in Bali — Nusa Tenggara Economic Corridor is estimated to be approximately $135 million (Coordinating Ministry for Economic Affairs 2011).

The economic corridors program will have an impact on several KBAs in the hotspot (Map 5.1). Improving access and promoting investment in previously remote areas will have significant impacts on biodiversity. In addition to direct land conversion, new road networks can lead to in-migration, the spread of frontier agricultural expansion, facilitate the illegal wildlife and timber trade, and enable the further expansion of agro-industrial plantations, leading to greater forest loss. At the same time, the intensification of fishing activities may lead to the depletion of fishing stocks and the destruction of coral reefs. The impact of the economic corridors for biodiversity conservation is further discussed in Chapter 6.

Figure 5.1. Map of the overlap of KBAs with MP3EI Economic Corridors



5.1.3 Main Economic Sectors

5.1.3.1 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 West Nusa Tenggara, South Sulawesi and North Maluku.

Nickel mining in Sulawesi contributes approximately 7 percent of the gross regional domestic product for Sulawesi. Sulawesi holds 50 percent of the nickel reserves in Indonesia, followed by Maluku and Papua. Areas with abundant reserves of nickel in Sulawesi are (1) Sorowako, East Luwu Regency, South Sulawesi; (2) Morowali district, Central Sulawesi; (3) Pomalaa, Kolaka district, Southeast Sulawesi; (4) Konawe district, Southeast Sulawesi (Coordinating Ministry for Economic Affairs 2011). For the industry, a major challenge in the acceleration of nickel-mining activities is the creation of downstream processing facilities to refine the nickel. There are plans to build four smelters in Sulawesi: two (nickel and steel) in North Konawe and the Konawe districts (a $2 billion investment by PT Stargate Pacific Resource); and two nickel smelters in Jeneponto (a $200 million investment) and in Morowali (investment of $1.06 billion), both to be built by PT Sulawesi Mining Investment (Basari 2013).

Nickel ore deposits are also found in the Central and East Halmahera districts, North Maluku. 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 about 54,000 hectares of mining concession 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. There are plans to build a nickel-processing facility and a 150 megawatt coal-burning power plant in West Seram, a $10 billion investment by Nickel Mining Indonesia Pte Ltd. in West Seram.[7]

The oil and gas industry contributed 7 percent of Indonesia's GDP in 2010 (EIA 2014) and provided $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 Central Sulawesi 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.

5.1.3.2 Forestry and Forest Plantation Sector

Forest industries have focused on exploitation of Wallacea's natural forests through the logging license (HPH, now 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 11.3 million hectares of production forest in Wallacea,

[7] berita.plasma.msn.com November 2012.

and licenses for exploitation of natural forest (i.e., industrial logging licenses) have been issued covering 2.8 million hectares, or 25 percent of this area, with another 0.2 million hectares in the licensing process as of November 2011.[8]

Production forest can also be licensed for the development of tree plantations (Hutan Tanaman Industri, HTI). National Ministry of Forestry policy supports the expansion of these plantations, which are primarily for fiber (acacia and eucalyptus) but also rubber and occasionally sago. In 2011, only 350,000 hectares, 3 percent of the production forest estate, had been licensed for this use. At the same time, however, a further 417,150 hectares of HTI license were in process, indicating that the subsector is expanding rapidly in Wallacea, as it has already in Sumatra and Kalimantan. The area of 350,000 hectares already licensed for HTI contrasts sharply with the Ministry of Forestry's land-use data from 2011, which records only 54,687 hectares of industrial forest plantation. This discrepancy is likely to be because licenses have been issued but plantations not yet developed — a phenomenon of land banking by companies that is familiar from Sumatra.

In addition to the licenses issued to companies, 296,603 hectares of community-based forest management licenses had been issued in 2011 under three schemes — community forests, village forests and community timber plantations, with a further 109,836 hectares of license in process at that time.

Sixty-two percent of the production forest estate, 7.1 million hectares, 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.

Broken down by subregion, there are some marked differences (Table 5.8). **Nusa Tenggara** has only 1.1 million hectares of production forest and no logging concessions. In 2011, however, 81,965 hectares of industrial timber plantation were already licensed, and a further 161,750 hectares were in process — meaning that HTI licenses may cover 243,715 hectares or 21 percent of the subregion's production forest estate, far higher than elsewhere. The subregion is also notable for having 33,706 hectares of community forests (HKM), with a further 45,481 hectares in process. **Maluku**, by contrast, has almost 1.6 million hectares of logging concession licenses, with a further 229,240 in process, and more than 200,000 hectares of HTI licensed or in process. This is the largest area of logging concessions, and it means that Maluku has 41 percent of its production forest under some sort of license, the largest proportion of any subregion. **Sulawesi** has 5.2 million hectares of production forest, the largest absolute area of any subregion, with 30 percent of it already under license and a further 5 percent in process.

[8] Data in this section is from a summary publication of the planning unit of the Ministry of Forestry, which uses data from November 2011. Downloaded from http://humasplanologi.dephut.go.id/sekdit/index.php?option=com_content&view=article&id=102&Itemid=109&lang=en on Feb. 20, 2014.

Table 5.8. Area of Forest Use Licenses in Production Forests in Indonesian Wallacea, 2011

Province	Total Production Forest (ha)	Current Licenses and Licenses in Process (November 2011)					Total License Area (ha)
		Logging License (ha)	HTI (ha)	Community Plantation License (HTR) (ha)	Community Forest License (HKM)(ha)	Village Forest License (HD)(ha)	
North Sulawesi	299,432	26,800	7,500	48,140	1,756	-	84,196
Gorontalo	423,407	133,500	75,920	13,005	-	-	222,425
Central Sulawesi	2,228,761	819,625	47,380	33,820	3,130	490	904,445
West Sulawesi	506,511	184,285	113,495	32,860	500	-	331,140
South Sulawesi	641,846	-	71,925	41,365	10,921	5,023	129,234
Southeast Sulawesi	1,089,570	89,590	-	68,945	25,866	5,000	189,401
TOTAL Sulawesi	**5,189,527**	**1,253,800**	**316,220**	**238,135**	**42,173**	**10,513**	**1,860,841**
East Nusa Tenggara	727,440	-	87,360	16,717	47,085	-	151,162
West Nusa Tenggara	437,309	-	156,355	4,396	32,102	-	192,853
TOTAL Nusa Tenggara	**1,164,749**	**-**	**243,715**	**21,113**	**79,187**	**-**	**344,015**
North Maluku		829,800	65,908	37,355	1,428	-	934,491
Maluku	5,011,728	991,125	140,505	-	-	-	1,131,630
TOTAL Maluku	**5,011,728**	**1,820,925**	**206,413**	**37,355**	**1,428**	**-**	**2,066,121**
TOTAL ALL	**11,366,004**	**3,074,725**	**766,348**	**296,603**	**122,788**	**10,513**	**4,270,977**
License areas as % of forest		**27**	**7**	**3**	**1**	**0**	**38**

Source: Department of Planologi, Ministry of Forestry. Accessed on Feb. 20, 2014, from: – http://humasplanologi.dephut.go.id/sekdit/index.php?option=com_content&view=article&id=102&Itemid=109&lang=en.

5.1.3.3 Oil Palm Plantations

Indonesia produced approximately 48 percent of the global palm oil supply between 2010 and 2011. Crude palm oil exports generated $19.7 billion for the country in 2011 alone, accounting for nearly 10 percent of total exports. Palm oil production directly or indirectly employs 4 million to 6 million people in Indonesia and also supports about 36 million people in rural areas of the nation (McGovern 2013). According to the Ministry of Agriculture, between 1990 and 2010, the area devoted to palm oil production in Indonesia increased nearly 600 percent. Today oil palm plantations cover between 8.2 million and 9.4 million hectares of land in Indonesia. It is estimated that the government

has already permitted and made land concessions on an additional 6.5 million to 7 million hectares. Further, the Indonesian Ministry of Forestry estimates that 24.5 million hectares remain suitable for palm oil production (McGovern 2013).

Wallacea has been on the margins of the Indonesian oil palm development, but it is increasingly becoming the new frontier of expansion. In 2011, there were only 257,955 hectares of oil palm plantations in the hotspot (Table 5.10), compared to 5,519,683 hectares in Sumatra (Directorate General for Estate Crops 2012). Nevertheless, as the figures in Table 5.10 demonstrate, the amount of land converted to oil palm is growing, and these figures may underestimate the actual area, especially the contribution of independent smallholder oil palm. In Gorontalo, for example, it is estimated that in 2011–2012 the Ministry of Forestry converted of 53,000 hectares of production forest to conversion forest (hutan konversi) to allow it to be removed from the forest estate and converted to palm oil plantations.[9] A number of districts in North Maluku, including parts of Halmahera, are being promoted as promising investments for palm oil plantations. On the island of Seram, there is already 10,000 hectares of palm oil plantations, and there are plans to expand this to 20,000 hectares.[10]

Table 5.10. Palm Oil Area by Province in the Hotspot 2008–2012 (Hectares)

Province	2008	2009	2010**	2011	2012*	% Annual Expansion, 2008–2012
Central Sulawesi	47,336	65,055	55,214	95,820	96,705	26.1
South Sulawesi	15,944	17,407	19,853	23,416	23,625	12.0
West Sulawesi	94,319	107,249	95,770	100,059	101,255	1.8
Southeast Sulawesi	21,033	21,669	25,465	38,660	39,003	21.0
Total Wallacea***	178,632	211,380	196,302	257,955	260,588	11.5
Indonesia	7,363,847	8,248,328	8,385,394	8,992,824	9,074,621	5.8

Source: Directorate General for Estate Crops (2013) www.deptan.go.id, http://aplikasi.pertanian.go.id/bdsp/hasil_kom.asp

*Preliminary Figures

**Ministry of Agriculture data shows a decrease in area of palm oil from 2009–2010. This is presumably an artifact of data collection

***Note that Ministry of Agriculture data does not show any oil palm in Maluku or North Maluku, despite the information quoted above suggesting that plantation development has already started in these provinces.

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, 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. According to the World Bank, global palm oil demand is expected to double by 2020, and an additional 6.3 million hectares of land will be needed to supply this demand, with most development expected in Indonesia (McGovern 2013). At present rates, the

[9] www.mongabay.co.id/2012/12/28/ratusan-warga-gorontalo-blokir-tumpukan-kayu-perusahaan-sawit/ Accessed Nov. 22, 2013

[10] http://fiqihnews.blogspot.com/2011/03/lahan-kelapa-sawit-di-seram-diperluas.html. Accessed Nov. 20, 2013.

expansion of the palm oil industry could result in conversion of nearly 20 percent of Indonesia's land to palm plantations by 2020 (McGovern 2013).

5.1.3.4 Cocoa

Indonesia is the world's second largest cocoa producer, contributing 18 percent annually to the global market. The commodity delivers the third largest foreign exchange in the plantation sector after palm oil and rubber. Indonesia is strengthening efforts to capture the benefits of 5 percent annual growth in the cocoa bean demand worldwide, and targets increasing income from $1.38 billion in foreign exchange (2009) to $6.25 billion by 2050. Efforts are being made to develop new plantations and downstream industry to capture the growing world market for processed cocoa bean.

Whereas Wallacea does not yet play a very large role in palm oil production, the region dominates the cocoa sector in Indonesia (Table 5.11). In Sulawesi alone, there are 938,195 hectares of cocoa (2011 figures), and Sulawesi accounts for 63 percent of the national cocoa production (Coordinating Ministry for Economic Affairs 2011). Most of the land used for cocoa production (96 percent of the total area) is owned by small farmers.

Table 5.11. Cocoa Area by Province in the Hotspot 2008–2012 (Hectares)

Province	2008	2009	2010	2011	2012*	% Mean Annual Expansion, 2008–2012
North Sulawesi	11,898	14,383	16,867	19.,884	16,782	10.3
Gorontalo	10,883	11,145	11,370	15,606	12,135	2.9
Central Sulawesi	221,677	224,513	225,975	267,273	281,976	6.8
South Sulawesi	262,807	267,638	273,909	244,469	279,884	1.6
West Sulawesi	153,043	181,516	189,152	181,415	191,728	6.3
Southeast Sulawesi	197,449	239,125	249,275	229,432	249,683	6.6
West Nusa Tenggara	5,387	5,832	8,617	7,730	6,779	6.5
East Nusa Tenggara	44,527	45,129	46,447	56,763	48,421	2.2
Maluku	16,847	24,221	22,659	31,401	29,768	19.2
North Maluku	34,671	34,945	35,846	38,699	36, 093	1.0
Total Wallacea	947,291	1,034,064	1,063,250	1,072,788	1,100,374	4.0
Total Indonesia	1,425,217	1,587,136	1,650,621	1,732,641	1,732,954	5.4

Source: Directorate General for Estate Crops (2013). http://www.deptan.go.id/infoeksekutif/bun/isi_dt5thn_bun.php). Accessed Nov. 15, 2013. *Preliminary Figures.

Overall. the area of cocoa has not significantly expanded in the last four years in Wallacea (Table 5.11). In addition, per hectare production of cocoa, particularly in Sulawesi, is in a decline despite an increase in the planting. Productivity of cocoa farming is currently at only 0.4 to 0.6 million tons/hectare, compared with its potential productivity, which is 1 million to 1.5 million tons/hectare. The decline in cocoa productivity is closely linked to the condition of trees that have aged — most have been

exposed to attacks from pests and plant diseases, poor cultivation techniques for cocoa management, and limited infrastructure support for the activities of the cocoa plantation and processing industry (Coordinating Ministry for Economic Affairs 2011).

5.1.3.5 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 producer 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, the 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, and Dahuri 2013).

As a subsector of agriculture, fisheries contributes to 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. Maluku has been designated as a National Fish Reserve. Development of fisheries in North Maluku 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, Southeast Sulawesi, 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 has been report on problems of overexploitation of demersal fish and shrimp fisheries in South Sulawesi (Glaeser and Glaser 2010) and large pelagic fish in North Sulawesi (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 East Nusa Tenggara 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 South Sulawesi 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. Cultivation of these products, however, is still limited to research facilities owned by government and private companies.

5.1.3.6 Tourism

Tourism is an important component of the Indonesian economy as well as a significant source of its foreign exchange revenues. With approximately 8 million visitors to Indonesia in 2013, the tourism sector is expected to contribute $10 billion to the GDP in 2013. The tourism sector ranked as the fourth largest among the goods and services export sectors.[11]

The Top 10 tourist destinations in Indonesia are in Bali, Java, Sumatra and South Sulawesi.[12] Bali is still the number one tourist destination in Indonesia with only one region in the Wallacea Hotspot, South Sulawesi, registering in the Top 10. Private companies have already started to encourage tourists to venture beyond Bali to experience the attractions of West and East Nusa Tenggara, North Sulawesi and North Maluku, 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.

This tourism is based mainly on natural landscapes, wildlife and traditional culture, and, depending upon the form it takes, could either help to sustain the places that are the focus of attraction or damage them. Western and Southern Lombok are the only areas that have anything resembling Bali-style beach tourism. Wakatobi, Bunaken, Komodo and Toraja

[11] "2013, Devisa dari Sektor Pariwisata Ditargetkan Capai USD10," Sept. 3, 2013. http://berita.plasa.msn.com/bisnis/okezone/2013-devisa-dari-sektor-pariwisata-ditargetkan-capai-usd10-m. Accessed Dec. 30, 2013.

[12] "Time for N. Maluku to become tourist destination," May 8, 2011 http://www.antaranews.com/en/news/71168/time-for-n-maluku-to-become-tourist-destination. Accessed Dec. 30, 2013.

are internationally recognized and marketed. Wakatobi, in particular, has been successful in transforming itself into a diving paradise, bringing in 3,000 visitors in 2010, up three times from 2007 when it first opened its airport. The town of Labuanbajo on Flores has undergone similar rapid growth spurred by tourism to Komodo. Central government efforts to promote tourism are supported by provincial and district governments throughout the region because tourism is seen as a welcome additional source of local revenue. All provinces, districts and cities in the hotspot have government agencies mandated with tourism development and promotion. Nevertheless, the impact of the tourism on the environment and local populations is not well documented. Many of the tourist destinations overlap with KBAs and as such there may be potential negative impacts on the ecosystems that are rich in biodiversity.

Community-based tourism is still in its infancy in the hotspot, but is the focus of a number of development projects in the region, including the World Bank Coremap program, and Swisscontact's work in Flores.

5.2 Timor-Leste

Timor-Leste accounts for 4 percent of the population of Wallacea, with an economic growth rate of 2.4 percent in 2011, and poverty levels of 28 percent, the country faces different social and developmental challenges from much of Indonesian Wallacea.

5.2.1 Social and Demographic Trends

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[13]. 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[14] people were displaced.

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.

Timor-Leste's ranking in the Human Development Index moved from 162nd (ranking as a least-developed country) in 2009 to 120th (ranking as a medium-developed country) in 2010.

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[13] World Bank Joint assessment mission to East Timor December 1999, p. 4.

[14] CAVR (2005), *Chega! The Report of the Commission for Reception, Truth and Reconciliation in Timor-Leste*, p. 95.

The Timor-Leste government's strategic development plan recognizes these gains and lays down an ambitious development plan: "In the last three years, Timor-Leste has experienced double-digit economic growth and a general improvement in people's welfare. Sector reforms and significant investments in the economy have taken place and the development of the oil and gas sector has begun. The strategies and actions set out in the Strategic Development Plan aim to transition Timor-Leste from a low income to upper middle income country, with a healthy, well-educated and safe population by 2030."[15]

The strategic development plan lays out a roadmap for development that focuses on four key areas: social capital, infrastructure, economic foundations and institutional development.[16]

While having made substantial progress in ensuring stability in the years following independence in 2002 and the crisis in 2006, there remain many economic, political and social challenges to be addressed. Performance on key socioeconomic indicators lags significantly behind those of other regions within Wallacea.

As identified by the government in its national report to the U.N. Sustainable Development Conference:

> The main challenges faced by Timor-Leste include poverty, low education, rapid population growth, high rates of rural–urban migration, high rates of unemployment especially among the youth, depletion of natural resources, food insecurity, vulnerability to natural hazards and climate change. Another challenge for the GoTL is how to best invest the income from country's non-renewable resources of petroleum and natural gas for the sustainable development of the country.[17]

Timor-Leste is the world's second most oil-dependent economy, and while substantial progress has been made, many civil society groups question the long-term sustainability of the plans for using this revenue[18] and highlight the need for the government to focus on human development and the non-oil economy.[19]

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[15] Government of Timor-Leste, Timor-Leste Strategic Development Plan 2010–2030, p. 9.

[16] Government of Timor-Leste, "Timor-Leste Strategic Development Plan 2010–2030.

[17] 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," p. 7

[18] International Crisis Group, "Timor-Leste: Stability at What Cost?" Crisis Group Asia Report No. 246, May 8, 2013.

[19] La'o Hamutuk (2013) "How long will the Petroleum Fund Carry Timor-Leste?" http://laohamutuk.blogspot.com/2013/07/how-long-will-petroleum-fund-carry.html , La'o Hamutuk 2013 "TL's wealth: for the past or for the future?" http://laohamutuk.blogspot.com/2013/03/tls-wealth-for-past-or-for-future.html , La'o Hamutuk 2012 "Timor-Leste is going for broke." http://laohamutuk.blogspot.com/2012/03/timor-leste-is-going-for-broke.html

5.2.1.1 Demography

The 2010 Timor-Leste census estimated the population at 1,066,409 people; 29.6 percent of the population lives in urban areas, with 70.4 percent living in rural areas and 41.4 percent under 15 years of age.[20]

The current fertility rate for Timor-Leste is 5.7 births per woman, which is the highest in Southeast Asia. At this rate, the population will increase to 1.9 million by the year 2025 and 3.2 million by the year 2050.[21]

The population density of 71 people per square kilometer in Timor-Leste is significantly lower than areas such as West Nusa Tenggara, North Sulawesi and South Sulawesi, but higher than other areas within the Wallacea area such as Maluku and North Maluku. The population growth rate of 2.41 reflects the average of the areas within the hotspot, although it is higher than the Indonesian average.[22]

Table 5.12. Population Statistics for Timor-Leste Compared to Maximum and Minimum Values for Wallacea as a Whole

Region	Population	Population Density (ppl per km^2)	% Annual Population Growth (2000–2010)
Timor-Leste	1,066,409	71	2.41
Wallacea	29,102,349	73.9	2.40
South Sulawesi	8,032,551	170	1.17
North Maluku	1,035,378	23	2.44

5.2.1.2 Employment, Migration and Urbanization

The 2010 Labor Force Survey shows an overall unemployment rate of 3.6 percent for 2010 (6.9 percent in urban areas and 3.1 percent in rural areas); however, the survey also reveals that 70 percent of the people in employment (some 176,000) 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.

An alternative analysis by local environmental NGO Lao Hamatuk shows that more than 71 percent of the 600,000 people of working age in Timor-Leste are involved in farming, fishing or are unemployed. The remaining 29 percent are working in the private sector (9

[20] Timor-Leste 2010 Census data, Socioeconomic Charecteristics, Vol. 3.
[21] Timor-Leste Demographic and Health Survey (TLDHS) 2009-2010, p. 50.
[22] Timor-Leste 2010 Census data, Socioeconomic Charecteristics, Vol. 3.

percent), as public employees (7 percent), as part of the government's casual labor $3/day scheme (6 percent), or are self-employed, i.e., driving a taxi, selling produce in a small kiosk or market (8 percent). A small percentage are working for the United Nations, embassies and international agencies (0.7 percent) and the petroleum sector (0.1 percent).[23]

The government estimates that more than 15,000 people enter the job market each year[24]. According to the 2011 UNDP Human Development Report:

> Youth unemployment remains a crucial problem facing the government. It has three major causes: lack of job opportunities due to the weak state of the non-oil economy; lack of appropriate skills when job opportunities become available; and lack of means for connecting employers with available job seekers. The immediate challenges for Timor-Leste are to create jobs, foster the skills needed to fill these jobs, and to match job seekers to the needs of employers. This situation is particularly crucial for Dili, with its agglomeration of post-secondary education institutes and its high levels of youth in-migration.[25]

5.2.1.3 Livelihoods

More than 80 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.[26] Some 98 percent of households use firewood as their primary source of energy.

According to the Ministry of Agriculture Seeds of Life Programme, agriculturally Timor-Leste lies midway between the Javanese rice culture and the Melanesian root-based culture. With features from both its staple foods include maize, rice, sweet potato, cassava, peanut, various vegetables, fruits, spices and tree crops.[27]

The 2010 Census shows that 63 percent of households are involved in crop production including: maize (55 percent), cassava (51 percent), fruit (48 percent), coconut (42 percent), vegetables (43 percent), coffee (28 percent), and rice (25 percent).[28] More than 86 percent of households are involved in raising livestock.

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[23] [23] La'o Hamutuk Powerpoint Presentation at ANU Seminar, Nov. 27, 2013. http://www.laohamutuk.org/econ/briefing/ANUBriefing27Nov2013En.pdf.

[24] Timor-Leste MDG Booklet (2010), p. 6.

[25] UNDP Human Development Report (2011), "Managing Natural Resources for Human Development: Developing the Non-Oil Economy to achieve the MDGs," p. 51.

[26] McClean, Alex, "Trocaire Timor-Leste: Final Programme Evaluation," p. 5.

[27] http://seedsoflifetimor.org/timor-leste-agriculture/.

[28] Timor-Leste Census (2010), "Census 2010 Figures at a Glance."

More than 70 percent of households experience food insecurity during the hungry season from December to February.[29] According to the Government Strategic Development Plan, average rural households go without enough rice or maize to eat for 3.8 months each year.[30]

5.2.1.4 Poverty and Human Development

> In recent years, Timor-Leste has experienced rapid economic growth, due primarily to the country's considerable oil and gas reserves, and as a result has come to be categorized as a lower middle-income country. Despite these advances, most Timorese people continue to experience poverty, deprivation and insecure employment.[31]

The Timor-Leste Survey of Living Standards[32] 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.[33] Poverty is greater in rural areas than urban areas.

According to the Demographic Health Survey, 58 percent of children under 5 are stunted, and 33 percent are severely stunted; 19 percent of children under 5 are wasted, and 7 percent are severely wasted.[34]

While general state budget spending on health and education increased from 12.6 percent in 2013 to 17 percent in 2014 it remains low in comparison with other developing countries.

According to the *Special Rapporteur on Extreme Poverty*:

> The extent and depth of poverty in Timor-Leste is even more severe than the income poverty statistics suggest. According to the Multidimensional Poverty Index, which identifies multiple deprivations in households with respect to education, health and standard of living, 68 per cent of the population in Timor-Leste suffer from multiple deprivations, and an additional 18 per cent are vulnerable.[35]

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[29] UNDP, *Timor-Leste Human Development Report 2011*, p. 52.

[30] Timor-Leste Strategic Development Plan 2011–2030, p. 107.

[31] Report of the Special Rapporteur on extreme poverty and human rights, Magdalena Sepulveda Carmona on her Mission to Timor-Leste, May 24, 2012, A/HRC/20/25/Add.1.

[32] RDTL Timor-Leste Living Standards Survey (2007).

[33] The World Bank (2009), Update of Poverty Incidence in Timor-Leste report predicts based on the 2001 and 2007 household survey data that the 2009 poverty incidence will be around 41 percent. Analysis of the 2011 Household Income and Expenditure Survey carried out by Lao Hamutuk suggests that over half of the population live on less than $1.34 per person per day, available at http://laohamutuk.blogspot.com/2013/06/understanding-timor-lestes-context.html.

[34] Demographic Health Survey Timor-Leste (2010), p. 150.

[35] Report of the Special Rapporteur on extreme poverty and human rights, Magdalena Sepulveda Carmona on her Mission to Timor-Leste, May 24, 2012, A/HRC/20/25/Add.1.

In rural areas 43 percent of households do not have access to an improved water source water, and 74 percent of households do not have access to improved sanitation.[36]

5.2.1.5 Ethnicity

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).[37] In addition, the constitution designates English and Bahasa Indonesia as "working languages."

5.2.1.6 Religion

Timor-Leste is a predominantly Catholic country. According to the 2010 census, 96.9 percent of the population is Catholic, 2.2 percent is Protestant or Evangelical, 0.3 percent is Muslim, and 0.5 percent practices some other or no religion.[38] 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.

5.2.1.7 Sociocultural Context

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 ("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

[36] Timor-Leste 2010 Census data — Socio Economic Charecteristics, Vol. 3.
[37] RDTL 2010 Census.
[38] RDTL 2010 Census.

major tool for conflict prevention and resolution at the local community level, for management of natural resources.[39]

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.

In 2012, Ermera District carried out a district wide *tara bandu* that looked to limit the amount of time and money people were spending on traditional marriage and death ceremonies (*lia moris* and *lia mate*). The push for this *tara bandu* came from multiple local actors who mobilized around the fact that despite being the most important coffee district in the country, Ermera has the worst human development indicators and is one of the poorest districts. Community discussions and research suggested that a large problem was the amount of money being spent on traditional ceremonies, in particular, funerals.

Tara bandu has also been used effectively by some NGOs to help manage marine and terrestrial protected areas, including areas within Nino Konis Santana National Park; coastal areas along the north coast; mangrove areas in Maubara, Hera and Metinaro; marine areas on Atauro Island; and many more.

5.2.1.8 Resistance structures

For well over 400 years, the history of the Timorese has been shaped by the imposition and resistance to foreign occupation. The resistance struggle is crucially important to the identity of the Timorese. As stated in the strategic development plan, "The Timorese people have shown remarkable resilience and dedication to their nation. In the pursuit of independence, we acted with courage, determination and creativity and suffered greatly to achieve our dream. The same characteristics that allowed us to gain independence can be harnessed to achieve our dream of a prosperous and modern nation."

At both the local and national levels, the resistance and clandestine structures and groups are a very important part of the system with veterans and resistance leaders playing important roles in decisions at both local and national levels.

5.2.2 Economic Context

According to government statistics, Timor-Leste has experienced double-digit economic growth and huge economic improvements over the last number of years.[40] 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

[39] 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.*
[40] Timor-Leste Strategic Development Plan, p. 8.

a global leader on issues facing fragile states through leadership of the g7+ platform for engagement in fragile states.[41]

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 95 percent of Timor-Leste's state revenues.[42] 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 $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 $670 million worth of goods and exported $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.[43]

5.2.2.1 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," currently containing $13 billion.[44]

The government has continuously withdrawn amounts far above the estimated sustainable income (ESI) from the Petroleum Fund. The 2012 state budget of $1.495 billion was more than double the ESI. The 2014 state budget is similarly significantly larger than ESI, which is projected to be $632 million for this year.

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.

Timor-Leste Strategic Development Plan 2011–2030

The Government of Timor-Leste prepared the 2011-2030 Strategic Development Plan, which lays out a vision for development over the next 20 years. It is built around four pillars:

[41] The World Bank Country Strategy Paper (2013).
[42] http://laohamutuk.blogspot.com/2013/07/how-long-will-petroleum-fund-carry.html.
[43] http://www.laohamutuk.org/Oil/TasiMane/11TasiMane.htm.
[44] http://laohamutuk.blogspot.com/2013/07/how-long-will-petroleum-fund-carry.html.

- **Social capital**, which is comprised of health, education and social protection, and aims to improve human development outcomes, create a labor force with marketable skills, and protect the vulnerable.
- **Infrastructure**, including transport, telecommunication, power, and water supply and sanitation, to increase connectivity, reduce transaction costs, attract private investment, and facilitate access to services.
- **Economic foundations**, which target three sectors for development — agriculture, tourism and petrochemicals — to bring about non-oil growth, jobs, and new sources of public revenues.
- **Institutions**, for sound macroeconomic management, a cross-cutting theme that aims to improve the capacity and effectiveness of state institutions through civil service reform and good public financial management, and to strengthen mechanisms of oversight, including the transparency of public decision-making.[45]

The Strategic Development Plan lays out five key areas crucial for economic cevelopment: rural development, agriculture, petroleum, tourism and private sector investment.

Within the plan, there are a number of large-scale economic development and infrastructure projects that will have a potentially large impact on surrounding ecosystems and communities. These include the Suai supply base, the Suai airport, the Tibar port, the Dili airport development, the Beacu LNG plant, the Betano refinery and petrochemical plant and the Beacu–Suai highway.

The plan also envisages two regional development corridors, one along the south coast and the other along the north coast, as well as a number of special economic zones. Planning work for the Oecusse Special Economic Zone is already underway.

The Strategic Development Plan lays down a number of targets for the agricultural sector, which include:

- The area of irrigated rice will have increased by 40 percent, from 50,000 hectares to 70,000 hectares.
- Average maize yields will have increased to 2.5 tons/hectare.
- At least 50 percent of fruit and vegetables will be grown locally.
- Livestock numbers will have increased by 20 percent.
- Coffee production will have doubled following the rehabilitation of 40,000 ha of coffee plantations.
- There will be at least three types of aquaculture activities supporting coastal communities.
- The fisheries sector will be export-based and have expanded to include ocean fishing.[46]

[45] World Bank and International Development Association and International Finance Corp. Country Partnership Strategy for Timor-Leste 2013–2017; Timor-Leste Strategic Development Plan 2011–2030.
[46] Timor-Leste Strategic Development Plan 2011–2030, p. 135.

5.2.3 Main Economic Sectors

5.2.3.1 Petroleum Sector

The Timor Sea contains a number of large oil reserves, including Bayu-Undan, Kitan and Greater Sunrise. Bayu-Undan is the largest petroleum project currently in operation, while exploitation of the Greater Sunrise field, which is larger than Bayu-Undan, is currently pending negotiations between the Timor-Leste and Australian governments. The reserves from fields currently under production may not last beyond 2025 at current rates of extraction, and revenues are estimated to have peaked at $2.8 billion per annum in 2011. According to government statistics for the 2014 budget, oil revenues are predicted to be lower than expected and the estimated sustainable income is expected to fall from $798 million to $632 million.

Bayu-Undan production is projected to end in 2020, and while Greater Sunrise gas fields could extend the natural resource windfall and other discoveries may yet be made, these are as yet uncertain and Greater Sunrise production remains stalled as the government attempts to renegotiate the CMATS treaty dividing the area.

5.2.3.2 Coffee

Coffee makes up 80 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.[47]

It is estimated that more than 52,000 hectares 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 hectares, 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.[48]

5.2.3.3 Agriculture

Agriculture comprises 30 percent of non-oil GDP. More than 80 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.[49]

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[47] Timor-Leste Strategic Development Plan 2011–2030.

[48] Timor-Leste Strategic Development Plan 2011-2030 page 135

[49] McClean, Alex, "Trocaire Timor-Leste: Final Programme Evaluation" Page 5

The World Bank Country Strategy notes that "agriculture remains an important buffer that absorbs excess labor, albeit with low value-added and salaries."[50]

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.

Erosion, low-soil fertility, lack of access to markets and limited agricultural extension work all impact to slow development of the agricultural sector. Shortfalls in agricultural production are driven by poor agricultural management practices, liquidity constraints which limit access to commercial inputs, poor infrastructure and high market access costs, and insufficient agricultural investment, both public and private.[51]

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.

5.3 Conclusion

The Wallacea Hotspot, whether in Indonesia or Timor-Leste, is now the focus of economic development strategies. Although Indonesian Wallacea's economic growth outshines other regions in Indonesia, development in the region remains very uneven, with rapidly growing cities such as Makassar, Manado and Mataram and significant numbers of poor, isolated communities, 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. Given the hotspot's low-population densities and geographical conditions, it is difficult to achieve the scale effects that have spurred development in Java (Resosudarmo and Jotzo 2009).

Resource extraction is being promoted by both countries to drive economic growth. For Indonesia, there is an expectation that the economic impacts of the investment in the natural resource base and associated infrastructure will allow it to catch up with the other regions of the country. As a nation in transition, Timor-Leste must also invest in its natural resources, particularly oil, in order to catch up. After years of conflict and neglect, economic development is a priority to accommodate the needs of a growing population. In a region that is so rich in biodiversity, there will invariably be negative impacts on biodiversity conservation.

[50] World Bank Country Strategy Paper 2013
[51] World Bank Country Strategy Paper 2013

5.4 Link to CEPF Monitoring Framework and Long-Term Goals

The measurement of indicators 9 and 10 in the CEPF monitoring framework address the number of beneficiaries affected by CEPF-funded programs. The baseline is 0. Special efforts should be made to ensure that projects funded under strategic directions 3 and 4, but also 2 and 6, establish baselines and monitor the impact of their interventions on beneficiaries.

Measurement of **indicator 11** in the CEPF monitoring framework, on changes in carbon storage in CEPF-funded sites, will be assessed through remote sensing. Projects funded under strategic directions 2, 3 and 4 are likely to impact on this indicator.

Measurement of **indicator 12** in the CEPF monitoring framework is concerned with water supplies from KBAs that are supported by CEPF. Projects funded under strategic directions 2, 3 and 4 are likely to impact on this indicator.

6. POLICY CONTEXT OF THE HOTSPOT

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 5, 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.

6.1 Indonesia

6.1.1 Overview of the National Political Situation

Since the fall of the 32-year old Suharto New Order regime in the late 1990s, Indonesia has made a remarkable transition from a dictatorship to a dynamic democracy. Some 119 million Indonesians voted in the parliamentary elections in April 2009, and a larger number will vote in 2014. All three national democratic elections held since 1999 are widely considered to have been fair and transparent.

Despite these remarkable achievements, Indonesia has yet to fully consolidate its democratic systems and institutions. The legislative branch faces challenges to be a fully effective institution. Political parties, which should be playing a central role in proposing alternative public policy solutions that reflect citizen priorities, struggle to define their political vision, engage voters and break free of the patrimonial patterns established in previous eras.

In 2014 the country will vote for a new president and representatives for all three levels of Indonesia's decentralized political structure — 560 seats in the national Peoples Representative Assembly (Dewan Perwakilan Rakyat, DPR), 2,137 seats in 33 regional Peoples Representative Assemblies (Dewan Perwakilan Rakyat Daerah, DPRD) and 17,560 seats in 510 districts and cities. One estimate indicates that potential voters total more than 187 million[52].

[52] Jakarta Post, Jan. 19, 2012, www.thejakartapost.com/news/2012/01/19/the-new-indonesia-67-million-first-time-voters-2014.html.

6.1.2 Natural Resource Policies and Laws

Indonesia does not have a natural resource policy framework per se; rather it would be more appropriate to describe it as a mosaic of sometimes conflicting laws and regulations that reflect a historical legacy of competing visions of resource management and use. According to a review by the Ministry of Environment, 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).

As Table 6.1 indicates, the decree on Agrarian Reform and Natural Resource Management (IX/MPR/2001 TAP MPR) issued by the People's Consultative Assembly (MPR) in October 2001 recognized that natural resource laws were overlapping and in contradiction with one another and instructed the House of Representatives and the president to immediately regulate the implementation of a reform program and to withdraw, amend or substitute all laws and regulations that contradict this decree (IX/MPR/2001 TAP MPR, Article 7). This has yet to be carried out.

As described below, Indonesia implemented far-reaching decentralization of government post-Suharto. Ideally, all laws relating to natural resource management should be in congruence with the decentralization laws. This is not the case, however, as there are at least five laws that ensure that the central government maintains control over key decisions on the exploitation of natural resources: Law 41/1999 on Forestry, Law 18/2003 on Plantations, Law 7/2004 on Water Resources, Law 27/2007 on Management of Coastal Areas and Small Islands, and Law 4/2009 on Mineral and Coal.

Before the establishment of the Ministry of Marine Affairs and Fisheries in 1999, there was no specific legislation concerning coastal resource management. Thus, marine and coastal management was sectoral in approach. The 2007 regulation on marine management and coastal areas is based on three regulations, namely the Fisheries Act 9/1985 (revised in Law 31/2004); Law 5/1990 on conservation of living natural resources; and Law 23/1997 on environmental management.

Table 6.1. Decrees, Laws and Regulations Related to Natural Resources in Indonesia

Law or Act	Role
The Constitution of the Republic of Indonesia, 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."
Basic Agrarian Law (UUPA), 1960	Customary (*adat*) rights are recognized under the law insofar as they do not conflict with the national interest.
Forestry Law 41/1999	State control over forests is reasserted. Customary forests are considered part of the state forest area.
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;

Law or Act	Role
Reform and Natural Resources Management	instructs the government to bring into line all natural resources management laws with the decree.
Law 31/2004 on fisheries	Governs fishery resources.
Decentralization Law 34/2004	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).
Government Regulation 38/2007 on division of roles in governance between central government, provincial government, and district/city dovernment	Regulates sharing of authority over environment, forestry and marine and fisheries among the levels of government.
Law 26/2007 on Spatial Planning	Governs zoning and spatial planning including coastal areas.
Law 27/2007 on the Management of Coastal Areas and Small Islands	Governs the management of coastal areas and small islands.
Law 4/2009 on Minerals and Coal	Governs exploitation of minerals and coal.
Law 32/2009 on Environmental Protection and Management	Promotes environmentally sustainable development through mainstreaming of environmental issues into planning, policy, licensing, supervision and control of developments affecting the environment; establishes strategic environmental assessment as a requirement for policies and programs.
Presidential Decree 61/2011 on the National Action Plan to Reduce Greenhouse Gas Emissions (RAN-GRK).	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.

6.1.3 Institutions for implementation of Resource Management Policy

Indonesia's biodiversity policy is set at the national level with implementation at both the national and local level. Responsibility for biodiversity, forest conservation and marine areas management is spread across a number of government departments and institutions. Overlaps and inconsistencies in legislation, noted above, contribute to a lack of clarity in government agencies roles and responsibilities in biodiversity conservation.

The Ministry of Forestry is one of the primary agencies with responsibilities for biodiversity conservation, a mission it delivers through the system of national parks and other protected areas, and through enforcement of laws on wildlife exploitation and trade. It is also the implementing agency for the Basic Forestry Law 41/1999 and for the Law on Conservation of Biodiversity and Ecosystems (1990), and thus manages the entire Indonesian national forest estate. The Ministry of Forestry's Directorate General of Nature Protection and Conservation (PHKA) is responsible for managing protected areas through Park Management Units. The park system is the largest and most institutionally well-developed component of Indonesia's conservation estate, and it forms the cornerstone of national and international biodiversity conservation efforts. Central government budgets and staff allocation for conservation in Wallacea are detailed in Chapter 10.

In addition to the Ministry of Forestry, there are at least 10 central, provincial and district government agencies that play a role in biodiversity conservation in the hotspot (Table

6.2). Reflecting the re-centralization of policy outlined above, management of land, forest and marine resources are the responsibility of the central government departments with provincial and district governments carrying out administrative tasks.

Each province and district is required to have an environmental agency (BLH) tasked with overseeing environmental management in the regions. These agencies are under the Ministry of Home Affairs (MoHA), and they coordinate with the Ministry of Environment. They have the potential to play in environmental management, but their budgets are small, personnel are poorly qualified and the scope of their work is unclear.

Table 6.2. Central, Provincial and District Government Agencies Active in Biodiversity Conservation in Indonesian Wallacea

Central Government Agency	Provincial/District Agency	Role and Responsibility
National Development Planning Agency (Bappenas)	Provincial and District Planning Agency (Bappeda)	Biodiversity policy, spatial planning, coordination and implementation of development planning
Ministry of the Environment	Provincial and District Environment Agency (BLH)	Coordination of environmental policy and impact assessments, monitoring and compliance with regulations, including marine environment
Ministry of Forestry Directorate General of Nature Protection and Conservation (PHKA) (protected areas and species conservation) Directorate for Production; Directorate for Forest Rehabilitation and Social Forestry (planning and licensing of exploitation of the national forest estate)	National Park Management Units (based in the regions, report directly to Jakarta) Natural Resource Conservation Units (based in the regions, report directly to Jakarta) Water catchment management units (BP-DAS) (based in the regions, report directly to Jakarta) Provincial and District Department of Forestry (report to District/Province head)	National Park management Enforcement of wildlife laws, protection and management of non-national park protected areas (nature reserves, wildlife reserves) Promote sustainable watershed management through cross-sectoral coordination, land and forest rehabilitation Administrative and control of state forest reserves and timber exploitation
Ministry of Marine Affairs and Fisheries	Provincial and District Fisheries Agency (may be combined with agriculture, plantations and forestry)	Management of marine and fisheries resources, conservation of marine and coastal areas including marine protected areas
Ministry of Home Affairs		Regional development policy, planning, and coordination from national perspective responsible for the environment agencies (BLH).

The National Development Planning Board (Bappenas) has a mandate to broadly coordinate all development sectors in Indonesia. The only bodies mandated with the coordination of natural resources management across sectors, either at the national or local level, are the Forestry Ministry's Water Catchment Management Agencies (BP-DAS), which are based in the regions. These agencies generally have limited influence over district and provincial policy, but serve to monitor developments and channel large amounts of funding from the Forestry Ministry for land and forest rehabilitation to the regions.

Decentralization and the natural resource sectoral laws lead an uneasy co-existence. Forestry, mining and fisheries are all under the jurisdiction of the central government, but the politics of decentralization means that there must be accommodation with the provincial and district governments. District governments have their own agendas and there is considerable pressure to generate income for the local treasury. Exploitation of the natural resource base is a source of income for provincial and district governments, especially in the resource-rich regions. The division of responsibilities between the central and district governments is often vague and the districts use the decentralization law as a justification to assert their control over natural resource matters in an effort to increase district revenues. According to the Department of Home Affairs, there are more than 7,000 provincial or district regulations in mining, forestry, trade and industry that do not comply with higher level regulations. Most of these regulations favor increasing government revenue at the expense of conservation (Nurhidayah 2010).

6.1.4 Land Tenure

The Basic Forestry Law 5/1967 gave the Ministry of Forestry jurisdiction over 72 percent of Indonesia's land mass or more than 140 million hectares. This includes 90 percent of the Outer Islands (off-Java) with an estimated 65 million people living in those areas (Fay and Sirait 2005). The Minister of Forestry has the authority to designate land as forest, determine the purpose and use of all forests, and regulate forest management — thus subordinating the rights of forest-dependent communities to national forest law and policy (Campbell 2002). Although the Basic Forestry Law 5/1967 was replaced by the Forestry Law 41/1999, the new law maintained the central government's control over the forest zone.

Two rulings by the Constitutional Court (45/2011 and 35/2012) could dramatically alter how the forest zone is managed. Ruling 45/2011 focused on the more than 140 million hectares of Indonesia's forest zone. Five district heads in Central Kalimantan challenged the designation of their administrative districts as part of the forest zone. The Constitutional Court ruled that the part of the wording of the article in the 41/1999 Forestry Law granting the Ministry of Forestry control over the land was unconstitutional and unenforceable. With only 14.2 million hectares of Indonesia's forest zone formally gazetted, the ruling could bring major changes to the way forests in Indonesia are managed.

In another ruling in late 2012 (MK 35/2012), the Constitutional Court ruled that customary forests of indigenous peoples should not be classified as "state forest areas." The decision resolved a major ambiguity in Article 1 of the 1999 law by clarifying the distinction between customary forests *(hutan adat*) belonging to the customary communities (*masyarakat adat*) that were controlled indirectly by the state, and state forests controlled directly by the state through the Ministry of Forestry. The court ruled that the word "state" should be scrapped in this provision: Customary forests are state forests located in the areas of customary communities. Article 5 of the same law was revised to also show that state forest does not include customary forest. The Community Mapping Network (JKPP) has mapped 3.9 million hectares of customary land, of which 3.1 million hectares is within forest areas (Sabarini 2013). The Indigenous Peoples Alliance of the Archipelago (AMAN) estimates that there are 40 million hectares of customary forests across the country (*Jakarta Post*, June 24, 2013). Figures for the Wallacea region are not available, but there are approximately 778 indigenous communities that have become members of AMAN.[53] Many of these groups still possess strong natural resource management systems/wisdoms.

The implications of the rulings are far reaching. They imply (i) challenges to the current extent and legal status of the state forest zone, (ii) questions about the future ability of the Ministry of Forestry to exert management authority over it, and (iii) changes to the formal and informal balance of power between central and regional government authorities in determining the allocation of land to forestry versus nonforestry purposes within provincial spatial plans.

Both rulings create an opportunity to refine district and provincial spatial plans based on respect for the rights of indigenous peoples and local communities and thus reduce forest conflicts and deforestation. Ruling 35/2012 means that Indonesia should formally recognize the rights of its indigenous communities through legislation and by resolving the claims of current licensees who have permits granting them access to forests now owned by communities. The government also has to map the country's forests and grant new ownership rights.

If poorly implemented, the forest zone ruling could allow regional authorities to convert forest to oil palm plantations. For indigenous peoples, the attraction of claiming land in the name of indigenous right has led to the creation of several competing indigenous councils all purporting to speak on behalf of local communities. However, in March 2013, 12 Indonesian ministries and institutions agreed to work together to delineate forest areas and identify third-party rights, a promising first step.[54]

[53] http://ipsarchipelago.blogspot.com/p/indigenous-people-of-archipelago.html .Accessed Dec. 13, 2013.
[54] John Hudson, One Word May Save Indonesia's Forests, Sept. 20, 2013. www.bloomberg.com/news/2013-09-19/one-word-may-save-indonesia-s-forests.html Accessed Dec. 13, 2013.

6.1.5 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 North Sulawesi (Mantjoro 1996), *Awig-awig* in Bali and Lombok and to some extent the *Ponggawa-Sawi* relationship in South Sulawesi (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 grass-roots 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.

6.1.6 Spatial and Land-Use Planning

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 nonforest 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 genuine participation.

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).

As of April 2013, only 45 percent of Indonesia's provinces and 56 percent of districts had finalized their spatial plans. In the Wallacea Hotspot, all of the provinces have finalized

their spatial plans with the exception of North Sulawesi and Central Sulawesi. The majority of the districts in the hotspot have also finalized their spatial plans.[55]

6.1.7 Development 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 current medium-term development plan (2010–2014) is the second phase and focuses on promoting quality of human resources, development of science and technology, and strengthening economic competitiveness. Realization of development planning is highly dependent on budget allocation, and a more realistic indication of the government's priorities can be seen in the center-piece strategy for national economic development, the Master Plan for Accelerated Economic Growth (MP3EI), which is an integral component of the long-term development plan.

The prime purpose of MP3EI is to enable Indonesia to become a developed and prosperous country with a national GDP of around $4 trillion to $4.5 trillion by 2025, thus becoming the ninth largest economy in the world. The plan identifies development corridors, the products and industries that will be prioritized for development in each, and the infrastructure and capacity needed to reach these goals for growth. In the Sulawesi corridor, there are plans for seven projects with an investment of $5 billion (Rp.61 trillion), two of which will begin in 2014, and five in 2017. In the Bali-Nusa Tenggara there are three projects scheduled with an investment of $3.4 billion, two of which will start in 2014 and one in 2017. Finally, in the Papua–Maluku islands corridor, two projects are planned with an investment of $275 million (Rp.3.3 trillion), one of which will begin in 2014 and the other 2017.[56] Presidential Decree No. 3/2011 on MP3EI prioritizes natural resource extraction and infrastructure development, and is not designed to rectify existing resource management regulations or rehabilitate the environmental damage caused by development programs.

At the same time, as the government has been promoting MP3EI as a means to drive economic growth, President Susilo Bambang Yudhoyono has committed Indonesia to reducing greenhouse gas (GHG) emissions. In a speech to G20 leaders on Sept. 25, 2006, President Yudhoyono said the government would cut GHG emissions by 26 percent by 2020 from business-as-usual (BAU) levels. With international support, he added, Indonesia could cut emissions by as much as 41 percent. The proposed policy would be a mix of stepping up investment in renewable energy, such as geothermal power, and curbing emissions from deforestation and changes in land use. He went on to state, "This target is entirely achievable because most of our emissions come from forest-related issues, such as forest fires and deforestation."

President Yudhoyono's statement was followed by the signing of a letter of intent between Indonesia and Norway in May 2010 to reduce deforestation, under which

[55] http://www.penataanruang.net/informasi.asp#fragment-11

[56] www.indonesiainfrastructurenews.com/2013/04/proyek-infrastruktur-mp3ei-dongkrak-pertumbuhan-indonesia-timur/.

Norway would provide up to $1 billion so Indonesia can protect its forests. Nearly one year later, President Yudhoyono signed a decree suspending new concession permits in primary forests and peat lands to reduce greenhouse gas emissions from deforestation and forest degradation. In June 2012, President Yudhoyono declared that by 2025 no exploitation of resources should exceed its biological regenerative capacity.

In February 2012, President Yudhoyono received the United Nations Environment Program (UNEP) Award for Leadership in Promoting Ocean and Marine Conservation and Management. The award was in honor of his personally spearheading the Coral Triangle Initiative (CTI), 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, which includes Wallacea.

6.1.8 Decentralization and Natural Resource Management

The decentralization process has resulted in a confusion of roles and responsibilities, with conflicting interpretations of rules and competing priorities, particularly with respect to forestry and natural resource management issues that affect biodiversity conservation in many ways (MoFEC 2000). District governments issue regulations and permits that allow or prohibit actions that may not conform to national laws. The central agencies may not recognize local rules as legitimate, but they do not have sufficient resources to enforce the rules consistently across Indonesia.

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 Ministry of Forestry, represented by the ministry's management units in the field. No management authority has been devolved to district governments, and 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.

6.1.9 Good Governance in the Hotspot

Decentralization is intended to bring government closer to the people through greater accountability, improved services, decentralized decision making and improved resource management (Armitage 2006). But after nearly 14 years of decentralization, frustration is growing with the slow pace of reforms. Although there has been progress in some areas, provincial and district governments are still performing below expectations overall. Of the 10 provinces in the hotspot, only North Sulawesi, West Sulawesi and West Nusa Tenggara scored above the national average based on criteria developed by the nongovernmental organization Partnership for Governance Reform (Table 6.4).

Table 6.4. Governance Score per Province for Indonesian Wallacea

Name of Province	Score	Ranking in the Nation
North Sulawesi	6.17	9
Gorontalo	5.64	23
Central Sulawesi	5.47	25
West Sulawesi	5.91	14
Southeast Sulawesi	5.05	27
South Sulawesi	5.67	21
West Nusa Tenggara	5.74	19
East Nusa Tenggara	4.87	30
North Maluku	4.45	33
Maluku	4.95	28
National Average	5.70	

Source: Kemitraa (2012).

A problem associated with decentralization that is of particular relevance to conservation is corruption in issuing approvals for investment projects. While central government retains the final authority to issue or deny business licenses, district governments (provincial where projects are inter-district) are authorized to issue licenses for land survey and acquisition, and to approve license applications before they are issued by the central ministries. This power creates opportunities for rent-seeking behavior among local officials and politicians. In Wallacea, East Nusa Tenggara was classified as the second most corrupt province in the country, with 32 cases before the courts and state losses of Rp 42.8 billion (Indonesia Corruption Watch 2009). Maluku was the fourth most corrupt province with 29 cases and state losses of Rp 30.4 billion, and South Sulawesi was sixth with 24 cases and state losses of Rp 40.4 billion. Data compiled by the Indonesian Forum for Budget Transparency (Fitra) also confirms the high levels of corruption found in these provinces. According to the Anti-Forestry Mafia Coalition, losses from corruption in the forestry sector, stemming from irregularities in the issuance of permits for plantations and mining sites in just seven provinces, increased from Rp 7 billion in 2003 to Rp 273 trillion in 2011. Furthermore, the coalition presented data indicating a link between corruption in the resource sector and district level elections. In 2009, which was an election year, there was a more than 2,005 percent increase in the number of permits issued for coal mining and plantation operations (Amelia 2013).

Finally, according to the Supreme Audit Agency (BPK), from 2008 to 2012 about Rp 2.2 trillion in public funds earmarked for regional funding have been misappropriated by corrupt local officials. Although law enforcement has been very uneven, since regional autonomy was introduced in 1999, 298 governors, district heads and mayors have been jailed.

6.1.10 Indonesia's Commitments Under Global Agreements

Indonesia is a signatory of various multilateral environmental agreements (Table 6.5), although implementation has been very uneven.

Table 6.5. Indonesia's Participation in Global Environmental Agreements

Name of Agreement	Status
Convention on Biological Diversity	Yes
Convention on International Trade in Endangered Species (CITES)	Yes
United Nations Convention to Combat Desertification	Yes
United Nations Forum on Forests	Yes
Cartagena Protocol on Biosafety	Yes
United Nations Framework Convention on Climate Change (UNFCCC),	Yes
Convention on the Conservation of Migratory Species of Wild Animals	Yes
Ramsar Convention	Yes
UNESCO's Man and the Biosphere (MAB) Program	Yes
UNESCO World Heritage Convention	Yes

6.1.10.1 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. Indonesia has a National Biodiversity Strategy and Action Plan (NBSAP), which should guide biodiversity conservation strategies.

6.1.10.2 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 (Southeast Sulawesi), is located in Wallacea (Table 6.6). Wetlands are under-represented in national protected-area networks, despite being some of the most threatened ecosystems.

6.1.10.3 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 eight biosphere reserves in Indonesia are three national parks in Wallacea: Komodo (East Nusa Tenggara), Wakatobi (Southeast Sulawesi) and Lore Lindu (Central Sulawesi).

6.1.10.4 World Heritage Convention

This 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 Island, with five other sites on the "tentative" list (Table 6.6).

6.1.10.5 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).

6.1.10.6 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. The Directorate General of Forest Protection and Nature Conservation (PHKA) is responsible for the monitoring and enforcement of CITES regulations in Indonesia.

Table 6.6. Sites in the Indonesian Wallacea Designated Under Multilateral Environmental Agreements

Name of Site	Ramsar	Natural World Heritage Site	Biosphere Reserve
Banda Islands, Central Maluku		Tentative	
Bunaken National Park, North Sulawesi		Tentative	
Komodo National Park, East Nusa Tenggara		X	X
Lore Lindu National Park, Central Sulawesi			X
Prehistoric Cave Sites in Maros-Pangkep		Tentative	
Rawa Aopa Watumohai National Park, Southeast Sulawesi	X		
Take Bonerate National Park		Tentative	
Wakatobi National Park, Southeast Sulawesi		Tentative	X

6.1.11 Indonesia's Commitments Under Regional Agreements

In addition to the global environmental agreements outlined above, Indonesia is a member of or partner in two significant regional organizations that have an influence on the parts of the hotspot: ASEAN and the Coral Triangle Initiative.

6.1.11.1 The Coral Triangle Initiative

The Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF) 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 biogeographic regions: the Indonesian-Philippines Region and the Far Southwestern Pacific Region. The former overlaps with Wallacea. The Coral Triangle covers six countries: Indonesia, Timor-Leste, the Philippines, Malaysia, Papua New Guinea and the Solomon Islands.

6.1.11.2 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 trans-boundary 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 that involves police, customs and environment agencies of all 10 ASEAN countries (ASEAN WEN 2009). It is designed to provide training and capacity building to agencies across the region and improve collaboration and coordination between member states.
The ASEAN Centre for Biodiversity (ACB), Philippines, is a clearing house for biodiversity data and a center for capacity building on biodiversity conservation throughout the ASEAN community.

6.2 Timor-Leste

6.2.1 Overview of the National Political Situation

As noted in Chapter 5, Timor-Leste has had a complex and violent history and is still engaged in building the capacities and institutions needed by a modern independent state. As a result of its history, Timor-Leste has laws, systems and legal mechanisms influenced by Portugal, Indonesia and the United Nations, in addition to the changes made by the national government post-independence. Efforts are underway to update and harmonize

these laws and policies, resulting in a dynamic policy environment. The next five years will be key for decisions on development pathways and the role of environment.

In the 16th century, colonial powers were attracted to Timor-Leste because of its sandalwood, marble and (later) coffee. Portuguese colonialism of the island was relatively laissez faire until the 1800s when Portugal became more intensive in its governance and in the 1850s when they first began to introduce coffee to the island. The Portuguese State broke the country into a system of Circuncricao (districts), Posto (subdistricts), Suco (villages) and Provacao (hamlets).

The U.N. Administration in East Timor (UNTAET) was set up by Security Council Resolution 1272 on August 25, 1999, and governed the country from August 1999 until full independence was restored on May 20, 2002.

The Fourth Constitutional Government, a coalition formed after the 2007 elections, focused its efforts on ensuring stability and growth with its key motto for those years "Goodbye, conflict; hello, development." The government successfully managed the IDP crisis by offering one-off cash payments for the rehabilitation of homes. Peaceful parliamentary and presidential elections were held in 2012 returning Xanana Gusmao and CNRT to power and replacing Jose Ramos Horta with Taur Matan Ruak as president. During this time, Timor-Leste became a key player in global discussions regarding fragile states, and the country now hosts the secretariat of the G7+ and the International Dialogue for Peacebuilding and Statebuilding.

The government has consolidated stability and growth in the short term through a system of cash payments to veterans, the elderly and others. While in the short term these policies seem to have been relatively effective, their long-term effectiveness and sustainability is questioned.

6.2.2 Natural Resource Policies and Laws

Conservation and natural resource management in Timor-Leste are influenced by the long history of exploitation of natural resources in the country. Accounts from the pre-Portuguese era describe an island with a rich and diverse environment with large stocks of teak, sandalwood and other hard woods. During this period, land and other natural resources were managed by local family groups. The importance given to nature and land at the community level and in traditional beliefs and ceremonies today have been passed down from this era (see Chapter 5).

> The people of Timor-Leste have a strong relationship with the natural environment. For generations, our ancestors depended on the environment for food, clothing, building materials and everything else essential for life. We lived in harmony with the environment using it sustainably to support our families.[57]

[57] Timor-Leste Strategic Development Plan, p. 153.

The era of Portuguese colonization saw a marked increase in the exploitation of natural resources and later the introduction of new cash crops for export, as well as the introduction of foreign crops into the territory. During this era, there was significant exploitation of sandalwood, teak and other resources.

The Indonesian era saw massive destruction of the environment throughout the country, both as a result of deliberate action by the Indonesian government and the army (including the alleged use of napalm) and the lack of understanding of the Timorese people about how to preserve the environment. Timor-Leste's oil and gas reserves undoubtedly played a strong role in the Indonesian decision to invade in 1975. Policies of forced migration, *transmigrasi* and *translokas,i* separated people from their sacred lands and forced them to move to other parts of the country.

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 country's Constitution (2002) lays the foundation for the citizens' rights to a healthy environment. Relevant articles of the Constitution 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 environmental decrees are under discussion at present. The **Biodiversity Decree Law** will include a provision for protection of threatened species, with some reference to protected areas. The decree is based closely on the National Biodiversity Strategy and Action Plan, and when passed, effectively implements the NBSAP.

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 hectares (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 committees as a forum for decision-making on management of the protected areas.

Outside the environment sector, education is a critical issue for Timor-Leste. The country is currently revising its primary school curriculum, adapting it from a Portuguese model to one that is locally relevant. Environment is integrated as a cross-cutting theme (E Lemos pers. comm. 2014), and there are plans to include information on wildlife and protected areas in teaching materials. Relevant legislation includes:

Law	**Role**
Indonesian Environmental Management Act (1997)	Governing environmental pollution
Indonesian Government Regulation 20/1990	Regarding water pollution
Indonesian Government Regulation 27/1999	Regarding environmental impact assessment
Indonesian Government Regulation 41/1999	Regarding the control of air pollution
Indonesian Government Regulation 85/1999	Regarding the management of dangerous or toxic waste
UNTAET Regulation 2000/17	Bans cutting, removal, logging and export (in any form) of wood, and the burning or any other destruction of forest
UNTAET Regulation 2000/19	On protected areas
Government Resolution 8/2007	Regarding protection of marine and terrestrial ecosystems
Government Resolution 9/2007	On national forestry policy and strategies that will encourage all entities to manage and protect all natural resources for long-term economic benefits
Government law decree 211	Regarding quarantine was established to prevent new species that may harm or threaten local species and other sources of biological diversity
Ministerial Diploma 429/2010	Defining a forestry sector plan
Decree Law 26/2011	Sustainable rural development
Decree Law 5/2004	General fishing regulations
Decree Law 5/2011	Environmental licensing decree law
Petroleum Act Law 13/2005	

Given its dry climate, steep topography and fragile soils, Timor-Leste would appear to have a high potential for environmental services type arrangements, where downstream users (consumers or companies, or government as a proxy for them) pay upstream land managers to ensure the continued quality and quantity of supply; however, the country lacks any models of this approach, and as yet has no regulations that could be a basis for

organizing payments or contracts between stakeholders (results of the Senior Stakeholder Workshop, Dili, February 2014).

6.2.3 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 body of the government 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; 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 the MCIA; managing, in coordination with the 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; 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**, the **Ministry of Oil and Mineral Resources**, the **Ministry of Justice** (which has responsibility for the management of land and property), and the **Ministry of Education and Culture** (which has responsibility for the maintenance of cultural heritage).

6.2.4 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 land laws regulating the use and definition of state land and has presented a draft transitional land law "which aims to define the procedures and regulations that will recognize and confer the first real estate rights in Timor-Leste." The somewhat controversial law will make fundamental decisions relating to land tenure in Timor-Leste and lay out a process for first recognition of rights. It has gone through many rounds of consultations and was vetoed by President Jose Ramos Horta in March of 2012, the latest version is awaiting approval from the National Parliament.

The vast majority of land (97 percent according to Daniel Fitzpatrick[58]) is still managed under customary tenure practices. The connection of communities to land and the ancestors of the land is of critical importance in Timor-Leste. Customary land ownership is organized around the notion of origin groups or "first possessors of land." Policy notes on customary land prepared in 2008 suggest that, "Customary land systems have been highly resilient in the face of Portuguese colonization and Indonesian occupation. After episodes of displacement during Indonesian occupation, customary land systems have reconstituted themselves around their core principles of origin and alliance."[59]

Civil society groups speak of the many "functions" of land, which include not only habitation, livelihoods and economy but also spiritual and political identity. According to the Matadala ba Rai civil society consultation process:

> "Land is a living space, land is a place for growing rice, land is a place for growing cassava and talas. Land gives us food and a place to build our kiosks. Land is a place for growing trees and raising animals. Land is a place for carrying water, for picking firewood and for foraging for medicine. Land is the basis of our culture because it is the walking place [footsteps] of our ancestors, the place of

[58] Daniel Fitzpatrick (2002), *Land Claims in East Timor*.
[59] Daniel Fitzpatrick, Andrew McWilliam and Susana Barnes (2008), *Policy Notes on Customary Land in Timor-Leste*.

> our sacred stones and our spiritual houses. Land is our identity and our family. Land is a way for us to share resources and to support each other."[60]

One of the most significant problems identified by community groups is that of "state land grab." An expropriation law has been written but not yet approved and much confusion remains about how and for what reasons the state should be allowed to take land belonging to communities or private individuals. These concerns are exacerbated by communities' lack of access to information and legal support when faced with land disputes and evictions.

In urban areas, overlapping claims to land, the state development program and falsification of documents have left many vulnerable households in particularly insecure tenure arrangements.

Civil society groups have submitted comments and analysis suggesting that the current draft land law could allow for a weakening of customary land rights.[61]

6.2.4 Marine Tenure

Customary marine tenure in some areas of the Timor-Leste coast includes ownership of fishing *weirs*, i.e., low walls built and operated by women to trap fish as the tide recedes (T. Cunningham, pers comm. 2013).

6.2.5 Development Policies and Programs

In 2010, the government developed and published the Timor-Leste Strategic Development Plan 2011-2030 with a vision that "by 2030 Timor-Leste will have joined the ranks of upper middle income countries, eradicated extreme poverty and established a sustainable and diversified non-oil economy." The TLSDP lays out an ambitious vision of the development of the country that includes significant development of the oil and petroleum sector, tourism and agricultural production.

The TLSDP is an aspirational document that does not specifically lay out plans or budgets for key plans; nonetheless, throughout the document, the need for the protection of natural resources and the environment is mentioned.

> "Now that the foundations of a new state have been established and we are on a path to peace, stability and food security, we have the opportunity to put strategies in place to meet our obligations under the Constitution to protect our environment and ensure that Timor-Leste's environmental resources are sustainably managed.

[60] Haburas Foundation (2012), *Community Voices on Land in Timor-Leste: Results of the Matadalan ba Rai Consultation Process.*

[61] Rede ba Rai submission on Customary and Community Land articles in the Transitional Land Law 2009 and 2011.

There is now an urgent need to renew and review the key laws and regulations related to the environment in Timor-Leste today."[62]

6.2.6 Decentralization and Natural Resource Management

Timor-Leste launched a program of decentralization of budgets and planning decisions to village (*suco*) level in early 2014. This is expected to increase the engagement of local stakeholders in decisions that affect them, including on resource management issues.

6.2.7 Timor-Leste's Commitments Under Global 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.

In response to global conventions, under the leadership of the Ministry of Economy and Development, the government has produced three 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).

While the Constitution lays out and guarantees certain rights and duties in relation to the environment and natural resources and the government has shown commitment in the signing of key conventions, the de facto realization of these rights will prove challenging, given some of the significant social, economic and institutional challenges outlined in Chapter 5.

6.2.8 Timor-Leste's Commitments Under Regional Agreements

At the regional level, Timor-Leste plays an active role in a number of resource management initiatives:

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 issues faced by CT-6 countries are illegal, unregulated and unreported (IUU) fishing activities.

[62] Timor-Leste Strategic Development Plan p. 53.

Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) is a multistakeholder body with representation of 13 countries within Southeast 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, IUU 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.

6.3 Links to CEPF Monitoring Framework and Long-Term Goals

Information on policy and regulations is relevant for the assessment of **Goal 1, Criterion 4 (**conservation plans) in the long-term goal matrix. As noted previously, Timor-Leste has ratified the CBD and developed a NBSAP and a National Ecological Gap Assessment. The biodiversity law that is currently being debated by the Council of Ministers (the final stage before approval) will reportedly implement the NBSAP. In addition, the new Protected Areas Law, also being discussed, will create a network of protected forests closely based on the IBA analysis. The draft map of protected areas was available to the CEPF team, and the KBA analysis and draft protected areas map are closely aligned. Both the NBSAP and the Gap Assessment explicitly refer to and build on the Important Bird Areas analysis for Timor-Leste, and thus indirectly address KBA conservation.

Data on policies is also used for the measurement of **Indicator 13** in the CEPF monitoring framework. Baselines and a suggestion of targets for monitoring this indicator are as follows:

<u>Indonesia</u>

1. A number of key species are missing from the list of species protected by law.

   Target: All globally threatened species in Indonesia are included in the list of protected species.

2. The constitutional court decision (MK35/2012) that excludes customary forest from the National Forest Estate will be implemented through changes in regulations, though it is not yet clear which agency(ies) will take the lead. Although the Forestry Ministry will no longer be able to issue licenses for these areas, it retains the authority to determine that they should continue to be managed as forests and to approve changes in use. It is likely that customary communities will be required to map their lands, demonstrate that there are no conflicting claims, and document that they

continue to organize themselves based on customary rules and institutions in order to claim lands.

Target: Development of regulations and protocols for recognizing customary forest includes provisions to safeguard against immediate land sales or clearance by communities or industry acting with community approval.

3. In response to the recognition that a lack of clear rights and conflict within the forest zone are an obstacle to development, and specifically to constitutional Court Decision 35/2012 (see above), the Forestry Ministry has allied with the national Corruption Commission and the National Forestry Council to implement a process of "acceleration of gazettement of the forest estate." While there are advantages in having clarity over the boundaries of the forest estate, pushing this process too quickly with inadequate consultation risks creating further conflict with local stakeholders.

   Target: Implementation of the accelerated gazettement process in priority conservation areas takes into account local rights and local use of the forest zone, especially where negotiations between protected area and local stakeholders have already been carried out.

4. Community-based marine conservation currently emphasizes Territorial User Rights Fisheries (TURFs) as an effective approach. In contrast to its recognition of customary forests, Indonesia's constitutional court has ruled that marine resources may not be exclusively owned by a private group or entity, despite the existence of well-document customary systems for dividing marine areas and resources between users. The TURF approach has therefore had to work through restrictions on fishing equipment and methods, including on boat size, that apply to all users but effectively exclude commercial fishers and those from distant areas.

   Target: Without breaking the law, local regulations enable communities committed to conservation to exercise rights to exploit local fisheries and to exclude outsiders.

Timor-Leste

5. Biodiversity law is being discussed by the Council of Ministers. The law translates the NBSAP into conservation action.

   Target: The law is passed, with realistic and accurate lists of species that should be protected or are of conservation concern. Clear institutional responsibilities and budgets are allocated to support implementation.

6. A law on protected areas is being discussed by the Council of Ministers. The law is said to identify 50 terrestrial areas as protected areas and to mandate participatory boundary marking and the establishment of multistakeholder management

committees. One observer reported that the law has been shelved pending passing of an umbrella environment act.

Target: Law is passed. Implementation is piloted at priority sites.

7. The role of forests in watershed protection suggests that payment for environmental services might have a role in Timor-Leste. There is, however, no regulatory basis for establishing such schemes.

   Target: Regulation for a Payment for Ecosystem Services (PES) that defines institutional responsibilities and mechanisms drafted and submitted for approval.

8. The Environmental Impact Assessment Law should protect against poor environmental planning in large development projects; however, participants in the Timor-Leste senior stakeholder workshop reported that the conclusions of the assessments are often ignored in final planning decisions. Of additional concern is the fact that a law on mining being discussed in early 2014 effectively creates a loophole that allows mining companies to avoid doing an EIA.

   Target: The mining law is changed before it is passed, or amended, to remove the exception for mining companies doing an EIA.

9. A land law for Timor-Leste is being discussed in Parliament (February 2014) and may be passed in early 2014. The law creates community protection zones, where communities have the right to be consulted about proposed developments. However, the standards for the consultation mechanism are not specified, and it is unclear if, for example, a community rejects a development whether that decision has any legal meaning.

   Target: A land law is passed and piloted to bring greater clarity to the issue of community rights over land and forest.

7. CIVIL SOCIETY CONTEXT OF THE HOTSPOT

CEPF defines civil society as the entire group of nongovernment actors who have an interest in conservation and sustainable management of resources in the hotspot. This includes international, national and local actors; conservation NGOs; economic and 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 the sustainable use of natural resources.

This broad definition is pragmatic, because most civil society organizations cannot be neatly pigeon-holed as "conservation" or "development" organizations. Many CSOs in Indonesia and Timor-Leste 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 and economic 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.

Given the above, it needs to be remembered that the categories of CSO used in this chapter are meant to be a tool for analysis, and not an attempt to impose a classification or to oversimplify the complex and dynamic nature of CSOs.

Assessment Methodology

As described in Chapter 2, the ecosystem profile process organized eight stakeholder workshops in Wallacea, where local CSOs and government representatives provided input on KBA identification and on issues of CSO capacity. Of relevance to this chapter is the discussion on the second day of each workshop, which focused on capacity and the role of different stakeholders. The discussions took the form of a facilitated focus group, with the participants divided into three groups and answering a set of questions about the capacity strengths and needs of their sector, and about what they hoped from other sectors and from CEPF. The groups were government, community and NGO, and the relatively few representatives of the private sector, religious groups and universities were invited to join the groups where they felt they could make a contribution.

In addition to the focus group discussion, which asked the group to give general information, a questionnaire was distributed to CSOs that attended and was sent to other CSOs that were identified but could not attend. The questionnaire used closed- and open-question formats to probe perceptions of each CSO's focus, aims, capacity and needs.

Ninety-six questionnaires were returned, 68 from CSO participants of the workshops and 28 from nonparticipants. Some of them were filled out in great detail, sometimes with additional material attached, while others were brief. Eighty-seven were from Indonesia, nine from Timor-Leste. The results of the focus group and the questionnaire are below.

7.1 Indonesia

7.1.1 Civil Society Organizations in Indonesian Wallacea

The variety of approaches and structures used by CSOs working on environmental issues makes them difficult to classify. A useful grouping is to distinguish between:

People's Organizations, which 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 (e.g., the National Indigenous Peoples Alliance or AMAN and the Indonesian Farmers' Union or SPI)

Nongovernmental Organizations, which exist to pursue a vision of change that is external to the organization.

For-profit organizations, which address environmental issues but use a business model and profit generation as one (if not their main) purpose. These include cooperatives, fair-trade organizations, consultancies, and for-profit registered companies.

Within each of these groups are examples of organizations that are based at international, national and local levels. Cross-cutting across them is a wide range of philosophies, approaches and activities.

There are some outliers to this classification that are nevertheless important CSO groups:

- Religious groups or institutions often take on a social-environmental agenda, and can provide an important locus for change. In this sense, they are closest to nongovernmental organizations in that they are pursuing a vision of change that is global, not just for a specific group.
- Academic and research organizations are key players as gatekeepers to knowledge and advisers to local government. They may operate as nongovernmental organizations (primarily vision-driven), but they also often operate as for-profit, in that they work as consultants.
- Media are normally privately owned and exist as for-profit ventures, or sometimes as a platform to achieve political influence. Media are important for environmental aims when they take a position on relevant issues, e.g., promoting

coverage of local efforts toward sustainability, or investigating bad practices by a company. In these cases, they are combining profit and social motivations.

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 10. Table 7.1 summarizes the types of CSOs found in Wallacea.

Table 7.1. Classification and Examples of CSOs in Indonesian Wallacea

Origin and Scale of Organization	Category of Organization and examples from Wallacea		
	Peoples 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		TNC, CIFOR, ICRAF, WI-IP, WCS, Rare, Op-wall, Swisscontact, WVI, Oxfam, FPP, universities and research institutions	Mining, agribusiness, banking, infrastructure sectors, international media
National	AMAN, SPI, professional associations	WWF, Samdhana, Burung Indonesia, Kehati, Telapak, JATAM, JKPP, Walhi, TIFA, HuMa, KIARA, Religious organizations, AJI, Kemitraan, universities and research institutions	Same sectors, include government owned companies, producer associations, export associations, national media
Local (i.e., based in Wallacea)	Local chapters of many of the national organizations, culturally and regionally based associations, regional producers associations	Yascita, Pikul, Tananua, Santiri, ALTO, Jurnal Celebes, YANI, Yakines, Jurnal Celebes, universities and research institutions	Same sectors, locally operated and licensed, tourism and travel, local media
Community-based or site-based	Fishers groups, farmers groups, cooperative work groups, cultural organizations	Community forest protection groups, marine PA management groups	Community cooperatives, dive operators, community-based media

Research and consultation during the ecosystem profile process identified some general trends in the way that these CSOs perceive environmental and social issues. International NGOs tend to be most clearly differentiated into those driven by a "biodiversity conservation" vision and those driven by a "human welfare" vision. 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 brought both types of organizations toward a common enthusiasm for projects justified in terms of 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-driven vision, and many that combine interest in sustainability, welfare, and rights. This has brought them into conflict with official conservation at times, e.g., NGOs

in Central Sulawesi that would normally be considered "environmental" (such as Walhi) have opposed national park management as infringing on the rights of local people. 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 mediated through 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.

7.1.2 Operating Environment for CSOs in Indonesia

CSOs in Indonesia operate within a legal framework that regulates their existence, types of operations and position as a subject of law. Various legal frameworks that are directly or indirectly related to conservation serve both to create a space or opportunity, and to limit CSOs operations. This section aims to analyze various laws and regulation that apply to CSOs in pursuing their conservation goals.

7.1.2.1 Legal Framework

An Indonesian CSO's legal status depends on whether it is a profit or nonprofit entity. Nonprofit entities can be foundations (*Yayasan*) or associations (*perkumpulan*). There is no requirement for a group to have a legal status, and many local organizations remain unregistered; however, nonformal 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).

Profit entities can range from company to cooperative. 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 every company to implement social and environmental responsibility in the form of 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.

In the past, there were no restrictions on the Indonesian CSO receiving funds from overseas. Overseas funders wishing to have a formal presence in Indonesia are required to register with the Ministry of Law and Human Rights, and to do this they require a

memorandum of understanding with the relevant sectoral ministry, traditionally, the Forestry or Marine Affairs Ministries in the case of environmental work.

In terms of relevant laws and regulations, there are at least four ways that CSOs pursue their goals vis-à-vis the regulatory and policy framework as a "watch dog" or influencer of policy development and implementation, rights holders, collaborators and campaigners:

- National policies and regulations that open up a possibility for CSOs to take a position as a "watch dog," or influencer (giving inputs) include but are not limited to (a) Environmental Law 32/1999, which regulates requirements and mechanisms of payment for environmental services (PES), and the obligation to conduct a strategic environmental assessment (KLHS) prior to implementation of any development plans; (b) the Ministry of Environment's Company Environmental Performance Rating Program (PROPER), intended to work in parallel to regulatory approaches, which highlights good and bad actors on environmental standards; (c) Spatial Planning Law 26/2007 requires public consultation and participation in spatial planning process, implementation and control; (d) the timber legality assurance system (known by its Indonesian acronym, SVLK, from *system verifikasi legalitas kayu*), which uses independent certifiers and has a mechanism for third-party complaints; (e) the Marine Resource Law requires districts with coastlines to have "marine spatial plans," which must include at least one marine protected area; (f) the regulations on development of Provincial REDD Strategies and Greenhouse Gas Emissions Reductions Strategies, which require public participation; (g) the state forest boundary delineation processes and the village development planning process, both of which legally require public participation.

- National policies and regulations that create an opportunity for CSOs to take a position as right holders, such as: (1) Forestry Law 41/1999, which provides options for community-based forest management (HKM, HTR, HD), including designation of a special zone in a national park for villages and farms that has already existed before the park, and similar opportunities for coastal communities to set up local marine protected areas; (2) Constitutional Court Decision 45/2010, which denies the right of the state to claim management rights over a forest before any delineation and approval from local communities is completed; and Constitutional Court decision 35/2012, which denies the state's claim over customary forest, and has set the stage for claims from customary land holders; (3) Legal drafting on the Protection of Indigenous People Law, which potentially provides an opportunity to strengthen customary claims over land and forest territory; (4) Farmers Protection Law, which protects farmer's rights to produce local varieties and protection of land allocated for the cultivation of food crops.

- National policies and regulations that open up a possibility for CSOs to take a position as collaborators, such as the Ministry of Forestry Regulations related to collaborative management in protected areas, particularly in national parks.

- Irrespective of existing policies and regulations, CSOs can take a position as a pressure group, using their political influence to create their own platforms for communicating their position on an issue through local media, hearings with local and national parliaments, etc. Key national policy processes that have attracted CSO intervention are: (1) Decentralization Law 32/2001, which outlines the authority of local government in issuing location permits for mining and industrial agriculture plantations; (2) The Master Plan for Indonesia Economic Acceleration and Expansion (MP3EI), which lays out the road map for further natural resource exploitation for the next 20 years, particularly in the mining and plantation sectors.

7.1.2.2 Political Space

The rights of all forms of civil society to access public information are guaranteed by the Law on Freedom of Information. The law is now used in a few cases at regional and national levels, and there have been some successes in securing, for example, access to environmental impact assessment documents (B Purba, pers. comm.. 2014). The law opens up an opportunity for CSOs to access information on government planning related to their conservation and development work, such as provincial or district spatial plans and licenses.

In addition to the official opportunities for participation described above, there are a series of opportunities and limitations that influence the CSOs ability to operate effectively:

Opportunities include the fact that local governments often lack capacity and turn to CSOs who have data and technical knowledge to provide input to policy and planning process. This is especially important in the newly created districts: 29 of the 131 districts and cities in Wallacea were created after 2006. At the national level, these opportunities tend to be clustered around specific issues that are seen by government as CSO-relevant, including food security, outer islands, REDD and low-carbon development, CBD and the Aichi targets.

Non-official political space is exploited in terms of freedom of access to media and public demonstrations, which now are used by many NGOs and people's organizations to express their concerns and put pressure on unpopular policies.

Private sector CSOs have specific access to political space because of their financial influence with government. The forums for standards, such as the Roundtable on Sustainable Palm Oil, are also an important space for companies, NGOs and CBOs to meet and negotiate.

7.1.2.3 Limits to Political Space

The opportunities described above are not necessarily easy to exploit. Public consultation processes are often ceremonial, and emphasize top-down dissemination, instead of a genuine consultative effort by the government. Not all public consultation meetings are accessible to the relevant NGOs. Government 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. Other reasons it can be challenging to exploit this political space include:

- Corruption and a weak legal system militate against NGO attempts to litigate against district heads or governors on environmental issues such as forest degradation and deforestation.

- The lack of campaign funding and a lack of transparency in campaign funding lead to corrupt relationships between aspiring and incumbent politicians and businesses that want to get licenses for land and resource extraction.

- Limited access to "outside" experience from the local CSOs environment, such as training, international education, conferences and workshops, which are mostly confined to NGOs elites. This may reduce the opportunity to further professionalize the CSOs approach to conservation and development problems.

A further factor that can be an opportunity or a limitation to CSO effectiveness is the sometimes close relationship between local political and CSO elites. This may emerge in areas where customary and class-based social systems dictate that a small number of people, many of them with family or clan ties, secure the financial and educational opportunities that then lead to them entering politics, civil service or NGOs. Similar elite relationships, however, exist among alumni of prestigious universities. Some CSO leaders are ex-civil servants who have retired and moved into the voluntary sector, taking with them their networks and relationships. In the opposite direction, CSO leaders are increasingly becoming involved in local politics, and in some cases risk conflicts of interest between political ambitions and CSO leadership.

7.1.2.4 Funding Availability

Most of the CSOs in the Wallacea region face difficulties in accessing funds. Examples of problems with donor programs (problems with CSO capacity are discussed in Section 1.5) include the use of English by the donor institutions, dependence on the Internet to disseminate information, distance from donor offices, and the mismatch between the issues that are promoted by the donors and CSO priorities. The result in some areas is that a small number of well-organized NGOs have good reputation among donors and receive more funding than they can manage, while others struggle for support. The well-funded NGOs themselves may eventually suffer from problems of capacity and poor performance. A related problem is that, faced with the lack of CSO capacity, donors set up their own program implementation units and pay salaries that attract the best staff from local NGOs. This may build capacity for local NGOs over the long term, but in the short term it can be disruptive.

Many CSOs, however, receive funds from various sources, including donor funds (bilateral, multilateral and international donor), government projects and private-sector corporate social responsibility (CSR) programs. For instance, many POs receive funds from national conservation and development NGOs with local membership, such as JATAM and WALHI, from national grant-making organizations, such as Kehati and Samdhana, as well as from government projects. Conservation and development NGOs receive funds from international grant-making organizations and embassies, such as VECO, Finland embassy, ACCESS–AUSAID Oxfam GB. Some CSOs also receive CSR private sector funds that more often than not come with strings attached. Extractive industries want to spend around their operating area, or with local governments in order to obtain political support. Banks provide CSR funds, but their focus is on the productive efforts of communities that might in the future become their clients. CSR is accessible to NGOs, but they do not have much freedom with how the funds are used; they are just service providers for the company.

7.1.3 Civil Society Programs and Activities in Indonesian Wallacea

7.1.3.1 Major Conservation and Development Organizations at the National Level

International and national organizations working in conservation in Wallacea include WWF, TNC, WCS, Burung Indonesia, Rare, FFI, the Wetlands International-Indonesia Program, Kehati and the Samdhana Institute. Major development organizations whose work is often integrated with conservation issues include Oxfam GB, Oxfam Australia, Swisscontact, World Vision, CARE, World Neighbors, Save the Children and Threads of Life. Table 7.2 summarizes the main organizations, their areas of interest and main activities in Wallacea.

Table 7.2. Summary of Main CSOs and Activity Areas in Indonesian Wallacea

Organization	Areas of Interest in Wallacea	Focus of activity in Wallacea
Burung Indonesia	Sumba, Flores, Northern Sulawesi, Halmahera	Forest protection in protected areas and landscapes
CARE	Nusa Tenggara	Community development
Coral Triangle Centre	Banda Islands	Marine protected area creation and support
FFI	Lombok	Watershed management
GEF Small grants program	No specific geographic focus	Small grants to local CSOs
Kehati	No specific geographic focus	Small grants to local CSOs
Oxfam	Nusa Tenggara	Community development
Samdhana Institute	No specific geographic focus	Small grants to local CSOs
Save the Children	Nusa Tenggara	Community development
Swisscontact	Nusa Tenggara	Community development
TNC/Rare	Savu Sea National Park, Sumbawa, Wakatobi, Komodo, Lombok, South and Southeast Sulawesi	Marine protected area creation and support, regulation of live fish trade
WCS (Marine)	North Sulawesi, Lombok	Marine protected area creation and support
WCS (Terrestrial)	Northern Sulawesi	Forest protected areas, wildlife trade
Wetlands International	Flores	Mangrove management and rehabilitation

Organization	Areas of Interest in Wallacea	Focus of activity in Wallacea
World Neighbors	Nusa Tenggara	Community development
World Vision	Nusa Tenggara	Community development
WWF (Marine)	Marine corridor from East Flores to Timur, Banda Sea, Komodo	Marine protected area creation and support
WWF (Terrestrial)	Gunung Mutis (Timur), RInjani (Lombok)	Forest protection and rehabilitation

Donor programs (e.g., Ausaid and USAID) are described under the "conservation investment" chapter, although many of the local partners they work with are described in this chapter.

7.1.3.2 Networks and Partnerships

Network Organizations

Major conservation and development organizations at the national level work locally through collaboration and partnership with many local organizations or other national organizations with membership spread nationwide at the local level. This latter type of organization operates as a "closed" network. Membership and conventions are the highest level mechanism for decision-making. Many advocacy and community empowerment organizations work through networks of individuals and groups based in the region. 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 Southeast Sulawesi.
- JATAM: Member organizations work on advocacy activities related to small island/small watershed and mining issues.
- JKPP: Members organize and implement participatory mapping in East and West Nusa Tenggara, South, Central, Southwest Sulawesi.
- 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 social-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.

Partnerships

Partnerships are usually 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. The Eastern Indonesia Knowledge Exchange, or BaKTI, plays a role as an information clearinghouse for programs and development aid in eastern Indonesia.

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 indigenous people rights on 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.

7.1.3.3 CSOs in Sulawesi

A third of the Sulawesi NGOs that completed the questionnaire during the ecosystem profile process work on conservation issues, integrated with community development, research and education activities. Programs range from provincial to district level, including working with farmer groups at the village level.

In the islands of **North Sulawesi,** most CSOs are small conservation organizations focusing on species and site conservation. They include the "nature lover groups" that are active in conservation and education work in Kabupaten Sangihe, particularly around the critically important KBA Sahendaruman. On the mainland of North Sulawesi, CSOs include YANI, which is focused on conservation of the Nantu Reserve, Perkumpulan Celebes Biodiversity (CELEBIO), based in Manado, and Selamatkan Yaki, which works in Minahasa for conservation and research activities on the Sulawesi Macaque.

Relatively few CSOs work on conservation and environment issues were identified in **Central Sulawesi**, but there are other national NGOs doing work related to ecological justice, including WALHI and JATAM. According to Wibowo (2006), Central Sulawesi NGOs are divided into two factions: (1) local and international affiliated conservation NGOs that work for nature conservation, such as TNC and; (2) local and international affiliated NGOs that work for socio-ecological justice, such as WALHI and YTM. The latter group rejects the Lore Lindu National Park because it excludes local communities from their rights to access forest resources. YTM supports efforts of local communities through participatory mapping to reclaim the customary forest that was appropriated by the Lore Lindu National Park. These groups are strong advocates against mining.

In **East Sulawesi**, Conservation International initiated a marine program in Togean Islands and assisted in the process of delineation and establishment of the Togean Marine National Park. Assisted by the program and local CSOs, some local Bajau fisheries in the islands established community-based marine sanctuaries. A local NGO, Yayasan Toloka, deals with basic community empowerment and environmental issues, and recently is transforming into semi-ecotravel business. Another, ALTO, works for the conservation of forest in the Balantak/Tompotika area on the mainland.

Conservation NGOs and POs identified in **South Sulawesi** were small-scale organizations such as Lembaga Inisiasi Lingkungan dan Masyarakat (LINGKAR), and farmers organizations such as Kelompok Tani Panggala and Kelompok Tani Lestari. There is no specific information on the level of interest of local communities around the KBAs. However, Makassar is the base of the Sulawesi Community Foundation, a CSO funding and capacity building organization. It also has an active CSO community, as well as university outdoor/hiking groups. Lompobattang KBA is a popular hiking destination.

Southeast Sulawesi has many conservation NGOs, ranging from WWF-IP and local NGO LPSM YASINTA that work in Wakatobi to more site- and species-specific organizations such as Lembaga Komunitas Mangrove Taman Nasional Rawa Aopa Watumohai (LKM-TNRAW) and Lembaga Suaka Alam Indonesia (ELSAIN) in Buton. The provincial capital, Kendari, is home to the NGO YASCITA, which works on community rights, fair-trade chains and participation. It also runs a radio and TV station. YARI is another NGO focusing on marine issues, and some staff members of YARI run a diving center that empowers local communities as well. A local NGO called JAUH works closely with KHJL (Koperasi Hutan Jaya Lestari), a community-based cooperative producing certified logs in the South Konawe District, close to a KBA. The staff of YASCITA, YARI, JAUH and KHJL are active members of the Perkumpulan Telapak Chapter in Southeast Sulawesi. Another Kendari-based NGO that is actively working with local community in a KBA is LePMIL Sultra (the Institute for Coastal and Hinterland Community).

7.1.3.4 CSOs in Maluku

People's organizations dominate the composition of CSOs in Maluku. This may be a strength because of their proximity to KBAs in Maluku, but the challenge is the level and scope that they are able to cover, which tends to be local and micro.

The domination of people's organizations in Maluku is a response to the long-term social conflict in the region that started more than 10 years ago. Many people's organizations emerged from a peace-making process, and NGOs that used to work in conservation were transformed into peace-making and conflict reconciliation NGOs at that time.

Topatimasang (2004) explains that the emergence of people's organizations was not only the result of social conflicts and its reconciliation process, but was rooted in the resistance toward natural resource exploitation that had marginalized many communities in Maluku long before the colonial era. The organizations are strongly founded on customary *adat* values, which have survived more in Maluku than other parts of Indonesia. *Adat* values and territory of *petuanan negri* are not abstract concepts, but are concretely applied to daily life, including laws to regulate access to natural resources, called *Sasi*. Agreements on social reciprocity, such as *Pela*, and mechanisms for negotiation and cooperation between communities, such as *Pemiri*, are still functioning and applied. Experienced CSOs in the region include Baileo, formed in Maluku in 1993 to consolidate communities in Aru, Kei, Tanimbar, Lease and Seram, Yayasan Pengembangan Alam Raya dan Masyarakat Niaga (ARMAN), Yayasan Sauwa Sejahtera (YASTRA), Yayasan Almendo

and YPPM Ambon. Most environmental NGOs in Maluku work from Ambon and may cover other islands.

CSOs in the region have also had a number of environmental award winners. One winner of the prestigious National Kalpataru Award is the head of Kewang (customary caretakers of natural resources) who leads conservation in Haruku island. His organization, Kewang Negeri Haruku, is a member of AMAN.

Halmahera has a small, Ternate-based NGO community, including some focused on conservation research and education such as Konservasi Alam Maluku Utara (KAMU). Recently, some of the senior members of these organizations are reported to have moved into politics. There is an active chapter of the environmental advocacy group Walhi in Ternate. On Morotai, the NGO PILAS has facilitated community conservation activities. NGOs are also known to be active on Bacan. The indigenous people's alliance AMAN is strong in North and East Halmahera, where it works on critical education and mapping of rights. In April 2012, Tobelo, the capital of the North Halmahera District, hosted the fourth AMAN Congress, and the Bupati (head of district) became a member of AMAN's National Council. Other indigenous community groups who are not yet AMAN members also show a strong conservation commitment in this area, such as Kelompok Adat Suku Sahu. The regional NGO network SUKMA has one of its nodes in the region.

7.1.3.5 CSOs in Nusa Tenggara

Nusa Tenggara is highly socially heterogeneous, and this is reflected in the variety of types of civil society organizations from east to west. In contrast to other regions, religious institutions are an important part of the CSOs scene in Nusa Tenggara, including Pondok Pesantren (Islamic Boarding School) in Lombok and Sumbawa, and the Protestant and Catholic churches on Flores and Sumba. Another peculiarity that emerges from the profile, which is not found in other region, is the existence of local advocacy groups formed to reject mining in Sumba, as well as in Timor. Questionnaire results suggest that, as in Maluku, people's organizations dominate the civil society composition.

The high level of poverty in Nusa Tenggara means that the proportion of local economic development NGOs is high. Most of these organizations solely address local livelihood problems without relating to the spread of mining projects in Nusa Tenggara. The exception is Bengkel Tolak Tambang or Anti-Mining Workshop (BTT), which carried out some basic monitoring of the Laiwanggi-Wanggameti and Yumbu-Kandara KBAs in Central-East Sumba. There is also a well-known Sumba-based NGO, Yayasan Tananua, established in the early 1980s to first cope with critical dry-land in Sumba, and now works on other islands sharing its expertise on dry-land farming.

People's organizations on **Sumba** include Kelompok Mitra Pelestari Hutan (KMPH or community forestry) Wanggameti, Kelompok Masyarakat Pelestari Hutan (KMPH) Kambata Wundut, Kelompok Masyarakat Pelestari Hutan (KMPH) Dumalori, who are working locally. There are NGOs such as Yayasan PAKTA Sumba, who have a wider

scope, covering West, Central and Northwest Sumba. Others include Yayasan Satu Visi Sumba, a grassroots PO-NGO in Central Sumba focusing in food security and organic farming; Yayasan Sosial Donders, a church-owned NGO dealing with community economic empowerment and participatory development; and Pelita, focused on community-based forest management. There is an action-research NGO based in Waingapu, East Sumba, KOPPESDA, which was established by environmental activists and works mostly on providing data and assessment on sustainable use of natural resources. They also work in Wanggameti KBA.

Lombok has an active CSO community, with several that focus on forest conservation and a few on marine issues, such as JARI (Juang Laut Lestari), a well-established small NGO based in Mataram that has addressed coastal community and education on marine conservation issues since 1989. A subregion-wide NGO, SANTIRI, well-known among NGOs and POs throughout Nusa Tenggara, deals with various issues from conservation, community empowerment, climate-change adaptation on small islands and disaster risk reduction. Santiri serves as a sort of network and stipulates several local NGOs in the region, among others, facilitating SUKMA secretariat and nodes. Initiatives around Rinjani include community based forest management, strengthening customary and local government. Lombok's customary communities share a concept of the management of the island as a single entity. The 25 communities on the north side of Rinjani have strong customary traditions of conservation of marine and forest resources. A subset of community members have been successfully involved in conservation management of Rinjani through environmental services programs and trekking tourism guiding opportunities. Others see little benefit from the restrictions placed on their activities by conservation and remain in opposition to it.

The national participatory mapping network (JKPP) has a service hub for mapping in the region, and the regional network Sukma has one of its nodes in the region. At the individual level, another local champion from Lombok is Tuan Guru Hasanain who received the Ramon Magsaysay Award from the Philippines in 2011 for his effort in mainstreaming environmental education at his Islamic boarding school, Pondok Pesantren.

Sumbawa has far fewer CSOs, and it appears that those that exist tend to have been formed to advocate against Newmont, or to have been formed by Newmont itself. Two communities in Sumbawa have organized to resist the expansion of the Newmont Batu Hijau mine to new areas. There are, however, a handful of NGOs concerned with watershed and natural resource management.

The Nusa Tenggara Chapter of WALHI is based in Kupang, Timor, and focuses on environmental issues at a provincial level. A Kupang-based NGO, Perkumpulan PIKUL, works closely with local communities in Timor and other close small islands (Lembata, Solor, Alor, Pantar, Savu, Rote) focusing on food security and other indirect conservation issues, providing a sort of capacity building by direct empowerment.

Few CSOs are known from the islands of **Wetar, Alor, Rote** and **Solor**.

Important to highlight as well is the Molo community group, which rejects marble stone mining in their area (Mutis Mountain, West Timor) lead by Mama Aleta Baun (Box 1) who won the Goldman Environmental Prize in 2013. Mama Aleta's organization is a member of AMAN, and she herself is a member of AMAN's National Council. On Flores, Yayasan Cinta Daerah, CITRA, works in Ngada, and the Catholic Church's contribution in Flores is also important, as it works for the rejection of mining in Lembata, Flores.

7.1.4 Civil Society Capacity in Indonesian Wallacea

7.1.4.1 Capacity Required

There are three major threats to KBA as identified in the stakeholder workshops and questionnaire results (see Chapter 8 for details):

1. Legal and illegal mining is the most widespread and frequent threat in all regions.
2. Industrial/plantation agriculture is the highest threat, particularly in Sulawesi, but does not emerge with the same severity in other areas.
3. Unsustainable local use of natural resources — overfishing, poaching, logging and forest clearance — emerges in all areas at various levels of impact, but it is less significant than the two previous threats.

Each of these major threats requires a multilevel response, as it affects the social-ecological units from village to national level, and it is also facilitated by policies and regulations from district to national level. As described previously, CSOs in all regions are focused mainly at a micro level, that is, addressing the impacts of mining and fighting to end it, at the village level. The NGOs and POs in the Wallacea region have yet to develop antimining advocacy networks at the district, provincial and national levels. Although international recognition was given to a community leader who won the struggle with mining companies in East Nusa Tenggara, this recognition was insufficient to significantly scale up the antimining advocacy in the Wallacea region.

Concerning the unsustainable local use of natural resources, a careful approach is needed to address the groups that presumably practice destructive use of resources and the groups that were identified as environmental protectors. Misunderstanding or lack of understanding of the root problem could trigger an inappropriate intervention that may put both groups in opposition to one another. It is important to note that some parts of the Wallacea region have experienced social conflicts in recent years that could provide fertile ground for a new conflict.

As noted in Chapter 5, palm oil plantations are rapidly expanding in Wallacea, particularly in Sulawesi, while smallholder cacao plantations still dominate, although their expansion has leveled off. A careful analysis of the actual causes of environmental degradation and how to address it is required. None of the CSOs in Sulawesi has worked on the issue of cacao plantation expansion, because it may put the smallholders and

villagers in opposition with each other. They prefer to frame their advocacy against national park policy and large-scale plantation businesses, as both are considered to be the appropriators of people's land. A technical approach in terms of introducing and internalizing good agricultural practices to cacao smallholders could be an option to address directly the causes of the problem.

To address the threats above, four types of capacity are needed by CSOs in Wallacea:

1. **Advocacy capacity**, which includes:
    - The capacity to understand the legal framework that facilitates or limits activities on mining, industrial plantations and destructive use of resources, including analyses of opportunities to develop an advocacy strategy within or outside that legal framework, either through litigation or nonlitigation options; also the legal framework for management and protection.
    - The capacity to build networks and alliances in order to scale up the issue from micro to macro level, and divide the tasks among the alliance members to target different levels of advocacy; the capacity to design campaign and critical education materials.
    - The capacity to approach and lobby the key actors at government offices.
2. **Investigation or research capacity** to produce good knowledge of the problems before designing any interventions.
3. **Technical capacity** to tackle technical problems on unsustainable uses of natural resources. This capacity is important to provide choices and alternatives on the better practice of natural resource use.
4. **Facilitation and institutional strengthening** capacity.

7.1.4.2 Existing CSO Capacity

The capacity of urban-based NGOs tends to be higher than NGOs and POs in remote areas due to their relatively easier access to funding and capacity-building resources.

Between regions, CSOs' work on conservation activities in Maluku are relatively fewer in number than in other regions. This is triggered by the context of long social conflict, which has transformed many CSOs that formerly worked on conservation into peace-building, community-development and trauma-healing organizations. Therefore, in Maluku and North Maluku, many NGOs have developed a good capacity in political governance and democracy, instead of ecosystem conservation knowledge.

In Sulawesi, there is a sense of fatigue, saturation and a loss of momentum in solving the big environmental problems. The southeast and south Sulawesi chapters of Walhi, for instance, still expresses an anti-national park position, but are interested to work on advocacy to tackle mining issues. In Central Sulawesi, AMAN has taken an anti-national park stance because many of their members may be expelled from Lore Lindu.

Nusa Tenggara CSOs are very heterogeneous, comprising different types of organizations on different islands. Many of these CSOs are concentrated in Lombok and Sumba, followed by Timor. There are not many from Flores dan Sumbawa. Flores does not have

higher education institution, which has resulted in the Catholic Church taking a larger role in addressing community problems.

7.1.4.3. Gaps in Civil Society Capacity

Generic capacity gaps:

- Lack of technical capacity in conservation issues hinders the CSOs in making the links between CSO experience and activities with conservation activities. This includes a limited awareness about conservation, which leads to an understanding of it as a mere restriction rather than an opportunity to sustain people's livelihoods. Such problems constrain the CSOs to creatively analyze problems and formulate conservation measures.
- The capacity to develop project plans and proposals are very unequal between urban-based NGOs and small NGOs or POs working in remote areas. This includes a low capacity in fund-raising and sustainable financing of programs.
- There is a lack of knowledge of laws, regulations and their implementation, which is very important to support their capacity in defining problems and determining interventions.

Gaps in capacity to address threats:

- Overall, the CSOs in Wallacea region lack four main capacities to address the major threats: advocacy, research and investigation, technical skills, and collaboration building.
- There is a lack of local conservation NGOs and POs in Maluku. On the other hand, there is a high number of KBA in this area.
- In Sulawesi, none of the NGOs address issues of industrial-scale plantations, mainly due to their lack of technical knowledge. Meanwhile, certain NGOs express an anti-national park attitude, which raises difficulties in promoting conservation measures in this area.
- Nusa Tenggara has a broad range of CSOs, but the majority work on fishery and forestry problems. Only two POs were identified that address mining problems with advocacy work.

Gaps in geographic coverage:

- In Maluku, many CSOs are quite small and dispersed, which is difficult for alliances and collaboration building.
- In Nusa Tenggara, CSOs are concentrated in certain islands (Lombok, Sumba, Timor), and fewer work in islands where a higher education exposure is lacking (Flores and Sumbawa). Within the Wallacea region, Nusa Tenggara is a home to the highest number of CSOs.
- In Sulawesi, South Sulawesi is the weakest spot due to a very few organizations that actually work on conservation issues.

7.1.5 Addressing Gaps in Civil Society Capacity

7.1.5.1 Recommendations on Capacity-Building

A number of generic methods and approaches were proposed during stakeholder workshops and discussions, as well as from Samdhana Institute's experience of CSO capacity-building. The following should be considered in planning capacity-building work under CEPF:

- Develop learning circle sharing between CSOs to help reduce urban–rural capacity gaps. This can be done at the provincial or district levels, with occasional expert input from the national or international levels.
- Capacity improvement needs to include a generic capacity to write proposals, translating logical frameworks into program planning and managing its implementation. This should address the problems of making the links between conservation and CSO experience and activities, creatively analyze problems and plan actions, and develop project plans and proposals.
- Priority technical areas for capacity improvement are the impacts of mining, plantations, fisheries and forestry and how they can be addressed through advocacy.
- Support for networks, so they have the capacity to ensure sustainability of funding and capacity development in the future.

7.1.5.2 Grant-Making Mechanism

As noted in Section 1 to this chapter, there is an active and dynamic CSO sector in Wallacea where the lines are often blurred between the "development" and the "conservation" CSOs. This chapter has focused on mapping the CSO community in an effort to identify their needs, with less attention devoted to their successes. It is important to remember that many NGOs have successfully used evidence-based research to fight for new district regulations covering issues, such as community-based resource management, gender rights and improved public services.[63] This indicates a good capacity to organize, analyze and advocate at different levels of society. At the same time, national NGOs, along with their regional partners and the national networks active I this region, have been successful at taking local issues and putting them on the national agenda. What needs to be emphasized here is that capacity in advocacy, research and investigation as well as collaboration-building are present in Wallacea, but not necessarily in the thematic areas identified above or in the geographical areas that are needed. One of the challenges for CEPF will be to identify and draw upon the resources in these other sectors of the CSO community to address the threats noted above.

[63] See for example Nor Hiqmah, Korona, Muthmainah, Kurniawan, Luthfi, Perdana, Aditya dan Ahmad Yani (2008). *Gerakan Ekstra Parlementer baru: Mendorong Demokrasi di Tingkat Lokal.* Yappika. Civil Society Alliance for Democracy, Jakarta.

7.2 Timor-Leste

7.2.1 Civil Society Organizations in Timor-Leste

Under Indonesian occupation, civil society organizations in Timor-Leste were closely identified with the struggle for independence and could be classified as resistance, church and youth/student movements. Since 2000, the number of organizations has grown dramatically, catalyzed by political freedom, post-conflict and internal displacement 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), but it has now grown to 449 registered NGOs (FONGTIL 2013).

As in Indonesia (see above), the distinctions between people's organizations, including community-based organizations (CBOs), nongovernmental organizations, and for-profit organizations provides a useful framework for classifying CSOs. For national and local organizations, the distinction between NGO and CBO has become particularly important because of the requirement for NGOs to register with FONGTIL to access funding from international donors. Community-based organization 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 U.N. Administration, but now they are also 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 are:

- **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, and remains conservative on many social issues, but 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 is working 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) more than they do electronic or print media, or politicians and officials.

The Timorese Catholic Church is fundamentally conservative in its practice, with a strong adherence to hierarchy and the gender status quo, although it seeks compromises with traditional leadership to accommodate traditional spiritual practices alongside Catholic practices.

Table 7.3. 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 etc	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

7.2.2 Operating Environment for CSOs in Timor-Leste

7.2.2.1 Legal Framework

During the U.N. 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. A new law requires international and national NGOs to register with the Ministry of Justice; however, the new process remains unclear to many NGOs, and in practice registration with FONGTIL remains common practice and is considered by the vast majority of international donors as sufficient registration for funding purposes. One informant for this report 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 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, and thus has 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) notes 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 small-grants program 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).

7.2.2.2 Political Space

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

- The Environmental Impact Assessment Law (Law No. 5 2011) gives an opportunity for third-party complaints, although the recently passed mining act exempts mining from the EIA requirement.
- The draft Protected Areas Decree 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.

- The draft Land Law 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 not clear 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 sector investments, and could potentially be used more widely where community interests and areas of high conservation value overlap.

7.2.2.3 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, and there is not yet a standard mechanism for engaging civil society stakeholders (Engel 2006).

7.2.2.4 Funding Availability

Many CSOs were created or expanded on the basis of the large volume of donor funding in the country between 2000–2005. Since then, the funding situation has become 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 newly established GEF Small Grants Fund, managed by UNDP with a multistakeholder steering group. The program is a trial, running until December 2014, when the next round of GEF funding will come into force globally. As of October 2013, the program had run training in proposal development for stakeholders, and selected 10 CBO and 17 NGO proposals for funding. Maximum grant size is $35,000 for NGOs and $10,000 for CBOs. A number of the proposed projects are in or around KBA sites.

7.2.3 Civil Society Programs and Activities in Timor-Leste

7.2.3.1 Major Conservation and Development Organizations at the National Level

The only international conservation NGO in Timor-Leste is CI, which focuses on marine ecosystems under the Coral Triangle program, but plans to start working to address forest and watershed management in an integrated ridge-to-reef approach in pilot areas (R. Pinto pers. comm. 2014). The NGOs RARE and BirdLife International have also worked in Timor-Leste in the past but are not currently active. BirdLife International played a key role (with the Department of National Parks and Wildlife) in the identification of Important Bird Areas and the establishment of the Nino Konis Santana National Park.

A much wider 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 (in contrast to TAF in Indonesia, for example). It was, however, reported to be considering doing so in early 2014. Many of these organizations get their funding from the bilateral and multilateral donors detailed in Chapter 10.

An illustration of the range of types of national NGOs includes:

- Haburas Foundation, which is Friends of the Earth in Timor-Leste, is the oldest environmental-focused NGOs in the country, established in 1999. It works on a range of activities concerned with the promotion of environmental awareness, advocacy, and sustainable community management of resources. The organization and its director were the recipients of the 2004 Goldman Environmental Foundation Prize.
- La'o Hamutuk is an advocacy organization that focuses on the monitoring and analysis of state development projects, programs and policies, and advocating on the social and environmental issues that they raise. It emphasizes support for people's participation in the national development process.

- Institutu Matadalan Integrado (IMI) works on an implementation of *tara bandu* customary resource management practices in the 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 is starting to work on assisting communities to register land claims under the new Land Law.

7.2.3.2 Conservation and Development Organizations at the Local Level (NGOs and CBOs)

There are a number of locally based organizations working on environmental issues at community level in the districts of Timor-Leste. The following are examples:

- Santalum works on a reforestation project that involves the planting of more than 10,000 seedlings in Tasitolu to prevent soil erosion.
- Grupo Turismo Comunitaria Valu Sere, a community-based organization in the Valu Sere coastal area in the Lautem District, which developed a cooperative.
- Juventude Esperansa Ba Futuru (JEF) works for rural community development and natural resource sustainability in the Covalima District.
- Uniaun Agricultura Ermera (UNAER), which is an agricultural cooperative with membership, covers Ermera, the Liquisa District and Dili.
- Hametin Demokrasia No Igualdade (HDI) supports communities to combat poverty in the Ermera and Aileu districts.

7.2.3.3 Networks and Partnerships

FONGTIL is the NGO umbrella group, but there are a number of other civil society networks collaborating on advocacy issues, in particular, including Rede ba Rai, the civil society land network; and Hasatil, a network of NGOs, CBOs and other groups advocating for farmers' rights. At the district level, there are district 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) GIZ.

7.2.4 Civil Society Capacity in Timor-Leste

7.2.4.1 Capacity Required

Major threats to KBAs and species in Timor-Leste are over-fishing and over-hunting, smallholder agricultural expansion and, in specific locations, infrastructure development and urbanization (see also the Threats chapters). In addition, key cross-cutting drivers are the lack of resources from 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 in conservation. To respond to these issues, 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.

7.2.4.2 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 small-grants program 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.

7.2.4.3. Gaps in Civil Society Capacity

During the development of the ecosystem profile, 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.
- As a consequence of the above, there is a lack of ability to advocate for greater attention to conservation and environment by 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 under-mining 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 $500,000, and most work with far less than that, often less than $10,000.
- Lack of legal knowledge and the advocacy experience 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 between stakeholders working at the same sites and on the same issues.

7.2.5 Addressing Gaps in Civil Society Capacity

7.2.5.1 Recommendations on Capacity Building

Support by CEPF to 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. 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 (M. Mendes pers. comm. 2014). 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 KBAs 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 the proposed Protected Areas Decree, 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 between organizations with different skill sets may be an effective way of filling capacity gaps in the short term and enabling learning between organizations 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 under the CEPF program should emphasize sustainability and limit dependence on CEPF for support. Establishing accessible repositories of digital and written materials, support networks, and links to further sources of funding and support should be prioritized through all CEPF-funded, capacity-building activities.

It is important to structure the grant-making program 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.

7.2 Link to CEPF Monitoring Framework and Long-Term Goals

The information on CSO capacity gaps (sections 7.6.1 and 7.11.3) is relevant for assessing **Goal 2, Criterion 1** (human resources) in the long-term goals.

In connection with **Goal 2, Criterion 2** (Management systems and strategic planning), the CSOs that filled in the questionnaire distributed to stakeholders (see Methodology in this chapter and Annex 9 for the questionnaire and data) were generally confident about their own internal planning and learning ability (Table 7.4)

Table 7.4: Summary of Questionnaire on Internal Capacity for Planning and Monitoring

Criteria	# CSOs Evaluating Themselves for Each Category				
	Very strong	Good	Developing	Weak	Total respondents
Q18c: Planning of the activities of the organization	24	28	26	4	82
Q18e: monitoring results and lesson learning	16	30	27	8	81
Q18f: management of knowledge and information	14	33	22	12	81
Total score	54	91	75	24	

Indicator 20 in the CEPF monitoring framework addresses changes in the capacity of individual grantees. The baseline is zero until grantees have been selected and have completed the civil-society tracking tool.

Indicator 21 in the CEPF monitoring framework addresses the collective capacity of civil society in Wallacea. As noted in sections 7.6.3 and 7.11.3, there are important gaps in the skills and knowledge of CSOs in Wallacea, and in the geographical coverage of CSOs in Indonesia. The clusters of KBA prioritized for CEPF funding (see Chapter 12) include areas with relatively large, active communities of CSOs (e.g., South Sulawesi, Timor-Leste) where monitoring should focus on the joint capacity of the CSO community to address key threats and issues, and areas where CSO capacity is limited (e.g., Halmahera, Malili Lakes), where monitoring should focus on development of new organizations and coverage of issues by CSOs.

Indicator 22 in the CEPF monitoring framework addresses the capacity of networks in the hotspot. Sections 7.5.2 and 7.10.3 describe networks that currently are important in the region. Except for FONGTIL in Timor-Leste, all exist to address specific issues or sectors, for example, mining or participatory mapping. Networks do not exit to cover all of the issues that are highlighted in this profile, e.g., there is no CSO network on wildlife trade operational in Wallacea (although there are partnerships), or on addressing large-scale land-use change for agricultural plantations. Monitoring of networks should, therefore address two issues: changes in capacity in relations to the specific goal of the network, and coverage of key issues and geographies by networks overall.

Indicator 23 in the CEPF monitoring framework addresses the capacity of a CSO to respond to emerging issues and opportunities. Sections 7.4.2 and 7.9.2 describe some of the key opportunities that are available to CSOs to influence policies. These lists of opportunities — plus any other that emerge in discussions with CSOs — form the basis of a checklist that can be used to qualitatively assess the CSO response. Important issues

to cover would be knowledge of the existence of the opportunity, understanding of how it can be exploited, and existence of capacity to respond to the opportunity.

8. THREATS TO BIODIVERSITY IN WALLACEA

The landscapes and habitats of Wallacea have been altered by man 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 50 percent of Indonesia's threatened bird species, 35 percent of threatened mammals and 25 percent of threatened amphibians. 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 Sumatra or Kalimantan, the islands of Wallacea are a development frontier for extractive industries and agro-business, and further clearance and fragmentation will inevitably occur over the next 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 pressure on specific commercially valuable species. Competition with, and predation by, introduced alien species is a threat for some species in specific sites. For marine habitats, 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 habitats 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.

One of the challenges of analyzing habitat degradation and loss is the inconsistency of data. For Indonesia this analysis uses land cover mapping, which is available at two- or three-year intervals from the Ministry of Forestry. This data is good enough to allow the detection of gross changes in forest cover from year to year, although it is not adequate to monitor small-scale deforestation at site level, and it has some problems of consistency of interpretation between years.

8.1 Indonesia

This section describes the main direct threats to biodiversity in Indonesian Wallacea, outlining the extent, impact, drivers and trends. The threats are grouped into two main categories**: overexploitation of natural resources**, such as logging, fishing and collection of wild products; and **habitat degradation, fragmentation and conversion**, including mining, oil and gas, industrial agriculture and forestry, smallholder agriculture and livestock, urbanization, infrastructure development, and energy development. There is also a series of additional categories: **pollution, erosion and sedimentation; invasive species; and climate change.**

8.1.1 Overexploitation of Natural Resources

8.1.1.1 Unsustainable Industrial Logging

Logging selectively removes specific tree species, opens the forest canopy through road building and collateral damage from felling operations. Thus, it changes the forest structure and composition, with increased growth of dense understory and climbers, as more light penetrates to the forest floor. The changes benefit some species, but especially where they are extreme, tend not to be tolerated by forest-specialist species. Logging that is managed, as far as possible, 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. The two remaining logging concessions on the island of Obi, for example, are reported to help limit the expansion of artisanal mining and hunting of wildlife in their concessions (J. Mittermeier pers. comm. 2013).

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 nonforest uses such as oil palm. An alternative pathway — restoration of economic and commercial values — was created by the Ministry of Forestry in 2004, but so far only eight such licenses have been issued, covering a total of 350,000 hectares. Only one organization, Burung Indonesia, has so far applied for a restoration license in Wallacea.

The area of logging licenses in Wallacea is detailed in Chapter 5 (Socio-economic Context). Licenses for logging in natural forest cover just over 3 million hectares, or 27 percent of the state forest zone allocated for production. Just under half of this area (5 million hectares) is in Maluku and Maluku Utara provinces, with another fifth (2.2 million hectares) in Central Sulawesi, and the rest in five other provinces in Sulawesi. There are no logging concessions in Nusa Tenggara. No data is available on the sustainability of these concessions, except that two concessions in Wallacea have Forest Stewardship Council certification: Gema Hutani Lestari, which has a 148,000 hectare concession on Buru island and a mill in Makassar; and the Hutan Jaya Lestari cooperative

in Sulawesi Tenggara, a community logging operation that is so far the only one of its kind in Indonesia.[64]

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. Recently, 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.

Logging in natural forest seems unlikely to increase as a threat to forests. A total of 11 million hectares of forest in Wallacea is classified as "production" or "limited production" and therefore eligible for issuing logging licenses. Data is 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.

8.1.1.2 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 whether specific species are 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 penetrate terrain that no commercial operation would touch, although the distance timber can be carried by hand limits this kind of activity to a areas within 2 or 3 kilometers of roads or rivers. For this reason, illegal logging often moves into abandoned logging concessions, using the roads and clearing out the undersize timber 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 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 control the problem. A contributory factor was that many local and indigenous communities perceive the forest to be rightfully theirs. They resent the issuing of licenses to companies to exploit the forests, and saw the arrival of illegal loggers with financing and equipment as an opportunity to become loggers or to allow loggers to operate in their area. In some areas, illegal logging has

[64] Data from the TFT website, http://www.tff-indonesia.org/index.php/en/map-of-tff-activity/list-of-fsc-certified-forest-in-indonesia. Accessed Dec. 12, 2013.

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 is 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 agricultural 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 it moves toward 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 — places such as Halmahera and Seram — where building of new roads opens up forest that was previously inaccessible.

8.1.1.3 Unsustainable Small-scale Fishing

The use of bombs and poison to catch fish is not a new threat, but has grown in intensity with population growth and the ability of fishermen to travel to more distant areas. The practices destroy the reef and biota within it and, when combined with sedimentation or seawater warming, stress the coral to the point where disease and bleaching result followed by the physical erosion of the reef. Once this is widespread, recovery may be very slow, and reefs may flip to algae dominated systems. The nonspecific nature of bombing means many fish are being taken before they are mature, leading to breeding failure and population decline.

Destructive fishing is the largest threat to reefs. Moderate levels of blast or poison fishing are reported from throughout Wallacea, with high levels in South and Southeast Sulawesi, and around Banggai, Seram, North Sulawesi and East Halmahera. Combined with the threat of sedimentation, it is estimated that 93 percent of Indonesian reefs are threatened.

Destructive fishing is carried out by small-scale fishermen, sometimes local and sometimes traveling long distances to fish. Poison is used by specialist fishermen who collect particular target species from the reef, including for the live fish trade, by free-diving or using compressor and air-hose.

Destructive fishing occurs because reefs are open access, with no legal protection or protection that is difficult to enforce, and in some cases, where customary controls on fishing have broken down. This contributes to a situation where immediate gain at the expense of the future of the fishery is a rational choice. Community-based protected areas reinforced by legal recognition have been successful in reducing or displacing destructive fishing in some areas.

8.1.1.4 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 bush meat trade in Sulawesi, for example, has driven hunting of Babirusa and Anoa species.

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. In the marine realm, pressure on Napoleon wrasse (*Cheilinus undulatus*), the bump head parrotfish (*Bolbometopon muricatum*), sharks and rays, and live ornamental reef fish has been intensified as a result of improved transport and access to specialist markets globally.

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

8.1.2 Habitat Degradation, Fragmentation and Conversion

8.1.2.1 Industrial Agriculture and Forestry

Outside the national forest estate, the expansion of industrial agriculture, predominantly for oil palm but also for sugar cane, 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. In both cases, the use of large commercial plantations is often associated with promotion of 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.) Neither of these land uses yet occupies a significant area in Wallacea; however, 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 5.

A specific and highly damaging form of land conversion is the development of shrimp or fishponds in coastal mangrove areas. 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.

8.1.2.2 Expansion and Intensification of Smallholder Agriculture and Livestock

Despite urbanization and the growth of industry and services, Indonesian Wallacea's human population of 30 million is still overwhelmingly dependent on agriculture (and for a subset, fisheries) for their livelihoods. In the most densely populated provinces, North and South Sulawesi, Gorontalo and West Nusa Tenggara, 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, Central and East Sulawesi, and some of the smaller islands, means that larger areas of natural habitat remain in there, 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 the Sangihe Island tarsier (*Tarsius sangirensis*), or the 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 results in local extinction.

8.1.2.3 Mining, Oil and Gas

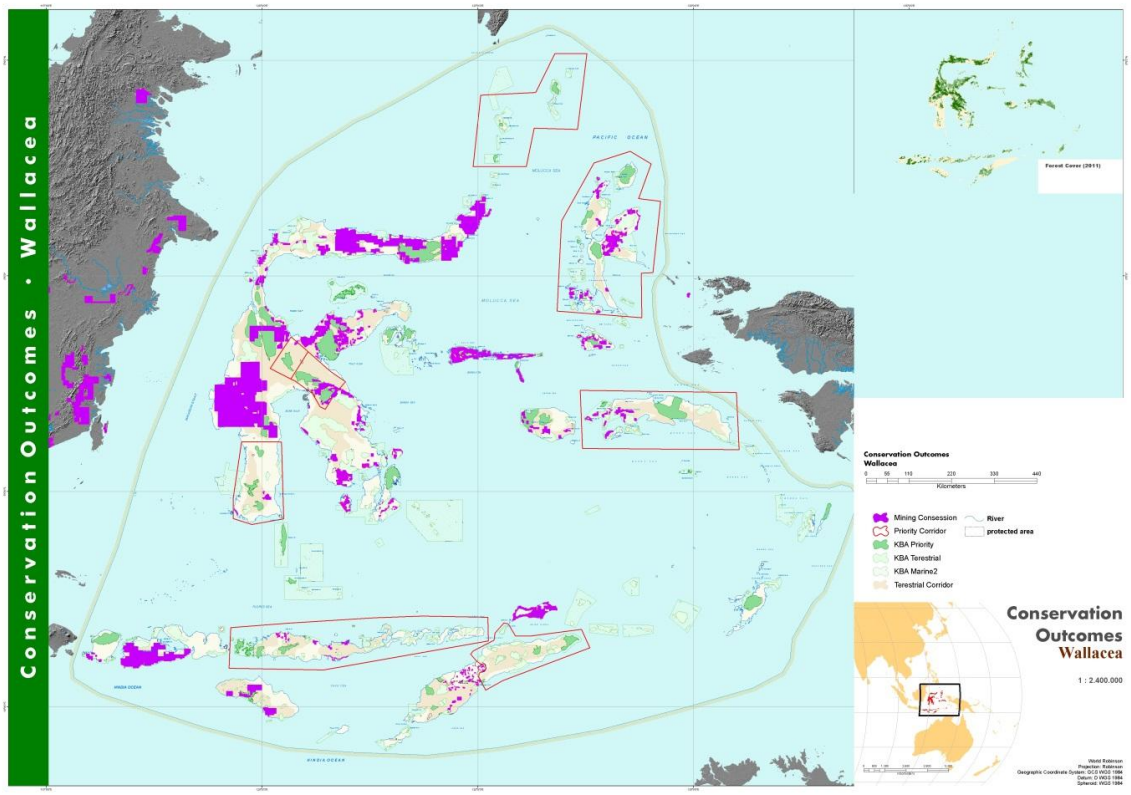
A legacy of its complex geological history and combination of volcanic and sedimentary minerals, Wallacea has significant mineral and fossil fuel reserves, and is the focus of numerous oil and mineral mining projects. Valuable minerals include the limestone karsts of South Sulawesi, nickel ore deposits in Halmahera, gold, iron sands, as well as oil and gas. Mining licenses require the approval of the district head, and this has made mining a significant source of legitimate and illegal income for local politicians and decision makers in some areas. Mining in state forest zones require a "use and return" (*pinjam–pakai)* license from the central Ministry of Forestry, and the need to secure this provides some control over mining in state forests.

Mining concessions are not distributed evenly throughout Wallacea. North Sulawesi, Gorontalo, West Sulawesi, East Halmahera and Western Sumbawa have a very high proportion of the land areas that are covered by exploration and exploitation concessions. There is also a concentration of mining concessions in the center of Sulawesi, close to the high-priority Malili Lakes and the Lake Poso KBAs. In Nusa Tenggara, in addition to Western Sumbawa, there are smaller concentrations of mining licenses in southern Lombok, eastern Sumbawa, Sumba, Flores and Timor. In Maluku, in addition to the large area in East Halmahera, there are concentrations of mining licenses in Wetar, Seram, Buru, Obi, the Sula Islands, and northern and southern Halmahera. Even though they are smaller, the environmental and social impact of the mining concessions on small islands

may be much greater because the natural area of habitat is limited, and there are fewer alternative sources of water and land for displaced populations.

In addition to licensed, large-scale mines, there are many hundreds or thousands of small, licensed and unlicensed mines operating in the region.

Figure 8.1. Mining Exploration Concessions in Wallacea



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 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 point where it supports forest-dependent biodiversity. In addition, mine wastes often contain 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 location, operation and impacts of the mine.

Small-scale mining, licensed or unlicensed, is limited in its ability to mobilize large machinery and capital, and thus 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, and 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 the Lalobata National Park in Halmahera. Finally, mining requires significant infrastructure, including ports, roads and processing facilities, energy generation plants, and water sources.

Off-shore mining has to date been the preserve of oil and gas, but shallow-sea mining of iron-ore rich sands is now starting around Siau (North Sulawesi) and is expected to damage sea floor ecosystems in these areas.

Chapter 5 noted the declining importance of oil and the growth of gas production nationally. Neither has been focused on Wallacea to date, but the development of a gas liquefaction plant near Luwuk in eastern Central Sulawesi, associated with the exploitation of gas reserves in the surrounding seas, is the first major development in Wallacea for this sector. In addition to the risk of oil spills and pollution, use of acoustic surveys has been associated with disturbance to cetaceans.

8.1.2.4 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 these 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 has more than doubled, to 112 districts and 18 cities.

8.1.2.5 Linear Infrastructure Development

Weak infrastructure is identified as a key constraint to Wallacea’s development. In an area with so many islands, this means ports as well as road and rail connections between economic nodes. Chapter 5 noted that the MP3EI is an agenda for major infrastructure development in support of accelerated economic development in the region. 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.

8.1.3 Pollution, Erosion and Sedimentation

Pollution is a particular problem in aquatic ecosystems. The Lindu, Poso, Matano and Towuti lakes of Central Sulawesi 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).

Sedimentation is also a major problem for coastal and marine systems, where reefs and seagrass beds are vulnerable to siltation and increased water turbidity. Chemical pollution occurs locally, such as where mining tailings are disposed directly into marine environments.

8.1.4 Invasive Species

Wallacea's isolation has resulted in high levels of endemicity, but may also have left species susceptible to invasive alien species. The lakes of Sulawesi, with their endemic and threatened fish, shrimp and gastropod fauna, have introduced common carp (*Cyprinus carpio*), two species of tilapia (*Oreachromis* spp.) and several other species. 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, which forms dense thickets and competes with native vegetation for light, water and nutrients (T. Cunningham pers. comm. 2013; global invasive species database).[65] *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 (global invasive species database).[66]

8.1.5 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

[65] http://www.issg.org/database/species/ecology.asp?si=137. Accessed Feb. 2 , 2014.
[66] http://www.issg.org/database/species/ecology.asp?si=137. Accessed Feb. 2 , 2014.

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 inter-tidal ecosystems, or will bring those ecosystems into competition with human pressures on land use.

These effects may interact with chemical pollution to make coral more susceptible to bleaching as a result of *el Niño* cycles and sea temperature rise. Past patterns of response can help indicate future vulnerability to climate change. The corals of the Lesser Sundas and Banda Sea suffered little damage and recovered well from bleaching events (Huffard *et al.* 2012), while the reefs of North Sulawesi, especially Sangihe-Talaud, were more severely affected and took longer to recover.

Some models also predict that increases in atmospheric carbon dioxide will increase sea water acidity, which will inhibit or reverse the conversion of dissolved calcium carbonate into solid reef. The effects of this on coral reefs are not yet certain.

8.1.6 Indirect Causes of Threats

8.1.6.1 Land-Use Planning

As described in the policy chapter, Indonesia has spatial plans at national, province and district level. In law, these plans should be combined with strategic environment assessments and used as a reference for environmental impact assessments, and could lay a framework for sustainable development, including the conservation of biodiversity. In practice, the data to develop the plans is 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.

8.1.6.2 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. Within the forest estate, policies emphasize development of industrial timber plantations, with the Indonesian Ministry of Forestry targeting an increase to from 6.6 million hectares in 2007 to 9 million hectares by 2014 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. HTI is 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. (These land-use types are often difficult to distinguish from secondary forest and scrub on satellite imagery.) In Sumatra, where forest land for development is at a premium, there are numerous cases of conflict between companies that have been granted a license for industrial timber plantation development and communities with de facto control of the land. In some cases, these are resolved in the community's favor, but in others they may displace smallholders

and create additional pressure on adjacent natural forest areas. The distribution and area of timber plantations in Wallacea is discussed in the chapter on investments.

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.

8.1.6.3 Legal Uncertainty

A series of issues around the legal status of the national forest estate have complex, and somewhat unpredictable, consequences for biodiversity conservation. As discussed in Chapter 6, two recent legal decisions have called into question the sole right of the Ministry of Forestry to delineate and manage the national forest estate without adequate consultation with local governments and recognition of customary rights. This has the effect of weakening the legal status of state forest areas that have not been through the full process of gazettement, which is estimated to be 75 percent of them. While these decisions appear to open the door to recognition of local communities' rights to manage forests, they raise major questions about where these customary forests are, what limits there are on the right to manage them, and what form of management is expected. Indigenous people's organizations are actively promoting awareness of the court decision, but are themselves weary of creating a "land rush," which triggers conflict and spurious claims, and results in areas of community land being handed over to companies.

8.1.6.4 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 and 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 allows 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 (a noted departure from the New Order Era pre-1998, when the army and police were a feared force that acted ruthlessly to exclude encroachers). 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 are 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. In Wallacea, this happened most famously at Dongi-dongi, where "reclaiming" of land in a lowland part of Lore Lindu National Park was actively supported by one group of NGOs, and led to a protracted conflict with the park and specifically the international NGOs supporting its management. Moving such conflict toward a situation in which all parties are willing to work on a negotiated settlement that will endure is a tortuous and demanding process.

8.2 Timor-Leste

8.2.1 Overexploitation of Natural Resources

8.2.1.1 Small-Scale and Illegal Logging

Wood is used as a fuel for cooking, fish smoking and heating by rural and urban households throughout Timor-Leste, and efforts to introduce liquefied petroleum gas or kerosene as an alternative have failed to make an impact. The disappearance of woodland and mangrove around Dili and the widespread degradation of water catchments are blamed on over-exploitation of firewood, although GEF (2012) notes that this is not a major driver of deforestation when compared to agriculture.

8.2.1.2 Unsustainable Small-scale Fishing

GEF (2012) estimate that 10,000 people are engaged in some level of marine resource use in Timor-Leste. As elsewhere in Wallacea, there is a general threat to reef ecosystems and fisheries from over-exploitation and destructive fishing methods.

8.2.1.3 Hunting and Collecting

Hunting of deer and pigeons for food, and cockatoo (*Cacatua sulphurea*) for trade is widespread among communities around the remaining forests. Hunting for food may be a serious threat for the snake-necked turtles (*Chelodina mccoordii*) in Lake Iralalaro (Nino Konis Santana National Park, KBA), which are gathered from the lakebed during dry periods and eaten by local people (R. Pinto pers. comm. 2013). Further research is underway on the threats and ecology of the species.

8.2.2 Habitat Degradation, Fragmentation and Conversion

8.2.2.1 Industrial Agriculture and Forestry

There is currently no threat from large-scale commercial forestry in Timor-Leste; however, there is also no legally defined state forest area (in contrast to Indonesia), and so all land that is suitable for intensive agricultural development is therefore potentially available. Large projects to develop sugar cane and Jatropha have been proposed for the south coast, taking advantage of the higher rainfall in this area. They may not pose a threat to the mountain forest KBAs, but would threaten the fragmented lowland forest and freshwater ecosystems.

8.2.2.2 Expansion and Intensification of Smallholder Agriculture and Livestock

A very high percentage of Timor-Leste's population is rural, and this is unlikely to change within this generation. The population growth rate is high, and pressure on resources is likely to increase with time. Customary mechanisms and rules on resource management are generally strong throughout Timor-Leste (see Chapter 5 for a discussion of this), but the extent to which they survive the pressure of increasing population and aspirations for development is not clear. Successful harmonization of customary norms and formal rules may be the best chance for ensuring the long-term survival of natural vegetation.

8.2.2.3 Mining, Oil and Gas

As noted in Chapter 5, Timor-Leste's income is from oil and gas revenues is critical for funding the country's development agenda, but the use of these funds and the development of industry is fiercely debated. The country has set up a petroleum trust fund and plans to invest heavily in the development of oil and gas processing facilities on the south coast. The economic, social and environmental sustainability of these developments is rejected by some local NGOs.

The potential threat to KBAs from oil and gas installations includes the danger of marine pollution, the impacts of acoustic pollution on whale migrations, and the loss of habitat on land when installations and associated roads and infrastructure are built. The displacement of local people and possibly an influx of migrants to the sparsely populated south coast are likely to put additional pressure on the fragmented lowland forests and wetland ecosystem of the area.

8.2.2.4 Urbanization and Tourist Facilities

Urban development along the coast around Dili threatens both terrestrial and freshwater ecosystems, and the fringing reefs are expected to suffer from increased sedimentation. Development is planned for housing and tourist facilities, an airport extension and a new parliament building.

8.2.2.5 Linear Infrastructure Development

The southern oil terminal project described above has associated with it the development of a south coast highway, upgrading communications between settlements on the south coast, and linking the south and north of the island. The quality of environmental precautions in the design of the roads is unknown. An improved road corridor linking the north and south coasts is also likely to increase access to the forests of the central mountains and may increase exploitation for firewood or land.

8.2.3 Pollution, Erosion and Sedimentation

Timor-Leste's important coastal fringing coral reefs are vulnerable to sedimentation and nutrient pollution from runoff from the land. The problem is less acute in the east, where limestone topography means there is less surface flow. It is a particular threat to the marine KBAs on the north coast where steep hills are close to areas of high population and low tree cover.

8.2.4 Invasive Species

McWilliam (2000) documents the spread of the South American invasive herb *Chromolaena odorata* (also called Siam weed) in Nusa Tenggara and Timor-Leste. The species was reported as well established on Sumba and Flores in the 1980s, and thrives in the dry conditions of this part of the Lesser Sundas, apparently dealing with fire more successfully than grasses. The plant spreads along roads and pathways used by cattle and then throughout open habitats, especially grassland. In some West Timor villages, it now covers up to 60 percent of the land, displacing grass, which is the food of cattle, especially during the dry season when fodder is scarce. *Chromolaena* itself is unpalatable and may be toxic to cattle. The impact of this invasive species is particularly significant given the important role that cattle plays in the local economy and culture. *Chromolaena* also out-competes *imperata* grass, a plant that is seen as an indicator of unproductive land by government, but is an important resource for thatch in the traditional houses throughout the Lesser Sundas. The spread of *Chromolaena* in Timor-Leste appears to be particularly strong in the drier climate of the northern lowlands of the country (McWilliam 2000).

8.2.5 Climate Change

Because of its dependence on upland agriculture in a region where rainfall is already marginal for maize production, Timor-Leste is particularly susceptible to changes in rainfall and temperature, and to greater variation and intensity of droughts and rainfall events, leading to increased runoff and erosion. These problems will be exacerbated by damage to the already over-stretched transport and communications infrastructure, and are likely to impact negatively on food security. Chapter 9 discusses these issues in more detail.

8.2.6 Indirect Causes of Threats

8.2.6.1 Poverty and Lack of Alternative Livelihoods

The primary agent of environmental degradation in Timor-Leste (with the exception of urbanization and industrial infrastructure) is poor land-management practices by a growing rural population that lacks access to information, improved crops, markets and alternative income sources. Many customary practices exist that might be part of the remedy for this problem, and many donor programs are attempting to develop models of more sustainable and secure resource use. Decentralization of some decision-making and funding to districts and subdistricts may strengthen the links between local decisions and environmental consequences, but they also may weaken the central government's ability to impose regulatory limits for the public good.

8.2.6.2 Poor Enforcement of Resource Use and Environmental Regulations

There is at present no effective formal system of land-use planning or land allocation outside of the urban centers in Timor-Leste. Improved land-use planning — especially clarification of customary rights and responsibilities for land and resource stewardship — will contribute to ensuring that, where possible, natural resources are used sustainably. The Land Law (see Chapter 6 on Policy) that is currently being debated may help to clarify customary ownership and strengthen rights, but it stops short of recognizing customary ownership.

Laws on environmental impact assessment and mitigation do exist, but in some cases are not effectively implemented. Nevertheless, they provide an entry point for a small group of vocal local CSOs to contest government decisions that they view as anti-people and anti-environment.

8.2.6.3 Weak Institutions for the Management of Protected Areas and Enforcement of Conservation Regulations

As noted above, Timor-Leste has created a system of protected areas on paper, but none of them yet has a management plan, and resources for management are highly inadequate. Only one protected area, the Nino Konis Santana National Park, has any management capacity (GEF 2012, P. Pinto pers. comm. 2014; see also Chapter 10). The park includes a number of settlements, lands and resources that are essential to community livelihoods. The ability of the park to engage with communities constructively, to negotiate win-win arrangements that allow livelihoods to continue, to achieve conservation goals and to generate alternative income sources will be key to the future success of management. The legislative framework for biodiversity conservation and protected-areas management will be strengthened by two decrees currently being debated (see Chapter 6 on Policy), but without additional resources they will not be implemented.

8.3 Results of Analysis of Threats to KBAs in Indonesia and Timor-Leste

This section combines data on KBAs in Indonesia and Timor-Leste unless specifically stated. Data on threats to KBAs comes from two sources:

- Data on threats to 197 KBAs (148 terrestrial and 49 marine) was gathered from stakeholders at the seven stakeholder workshops held in Wallacea. KBAs had between one and 12 threats (mean 3.19, n = 197).
- Data on land-use change and forest loss in and around all KBAs was obtained by comparing Ministry of Forestry land cover maps for 2000 and 2011 (for Indonesia only).

8.3.1 Frequency of Threats to KBAs

Threats were divided into 12 categories. The KBAs assessed experienced between one and six different categories of threat (mean = 2.6, n = 197). In 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 8.1).

Threats to 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 to about half of the KBAs. Among large-scale resource exploitation activities, only mining was at a similar level, reported as a threat for 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 8.1. Prevalence of Threats at KBAs According to Stakeholder Workshops

Threat Category	Prevalence in KBAs (% 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 area 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
n = 197 KBAs (148 terrestrial and 49 marine)			

The average number of threats per KBA varied little between regions — slightly higher in Sulawesi (mean of 2.7 threats per KBA, n = 73) and lower in Maluku (2.3 threats per KBA, n = 55). The frequency of different categories of threat varied between regions (Table 8.2).

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 percent and 40 percent of sites. By contrast, the most frequently reported threat in 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 8.2. Prevalence of Threats at KBAs per Region (Terrestrial and Marine Combined)

	Prevalence in KBAs (% of KBAs assessed where threats in this category were reported)		
Threat	**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

8.3.2 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 was of the threat was not available for all of these.) In 22 cases, the threats were considered to have happened in the past and no longer 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 reported threats were current, and three anticipated future threats — 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.

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). Other local community-based threats — in particular 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 8.3 summarizes the scores.

Table 8.3. Average Threat Impact Scores for Each Category of Threat

Type of Threat	a: timing	b: scope	c: severity	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		0.7	2.5

		0.8		
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 are calculated from the scores attributed to 268 threats reported for 197 KBAs by participants of eight consultative workshops in September 2013.
Scoring for “timing” is 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, on a scale of 0 = insignificant, to 4 = whole KBA or very severe degradation.

8.3.3 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 8.1–8.3 show the threats, aligned along axes of severity and frequency.

Key to the threat categories in Figures 8.1, 8.2, 8.3

Threat Category	Abbreviation in Figure
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

Figure 8.1. Frequency vs. Severity of Threats at 197 KBAs

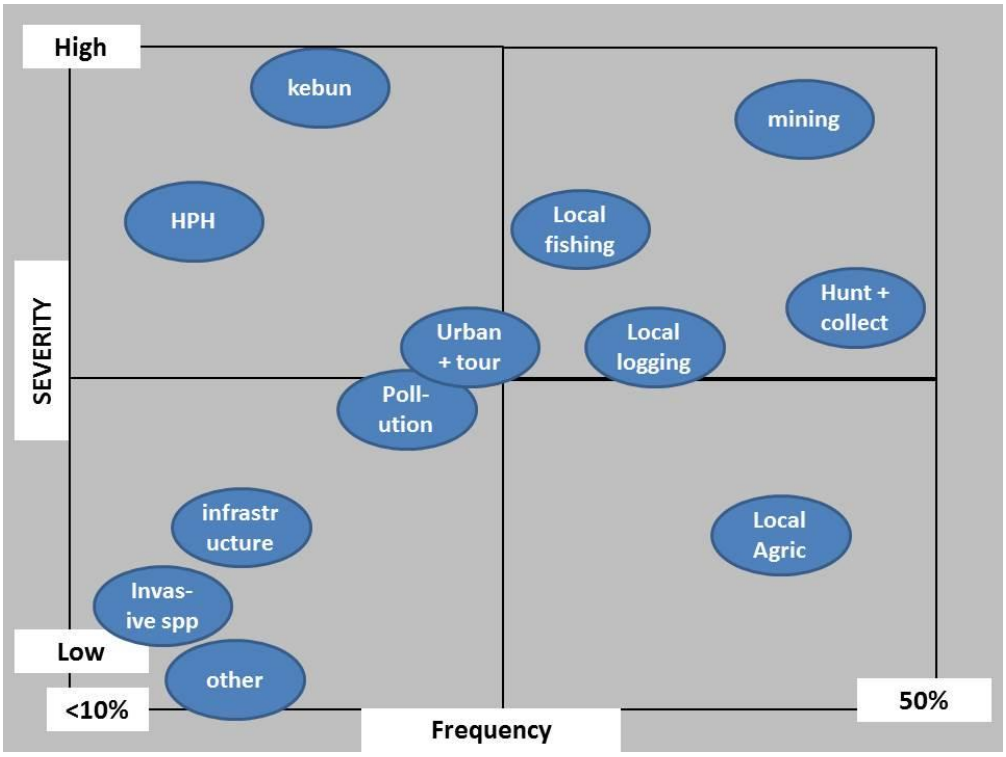


Figure 8.2. Frequency vs. Severity at 148 Terrestrial KBAs

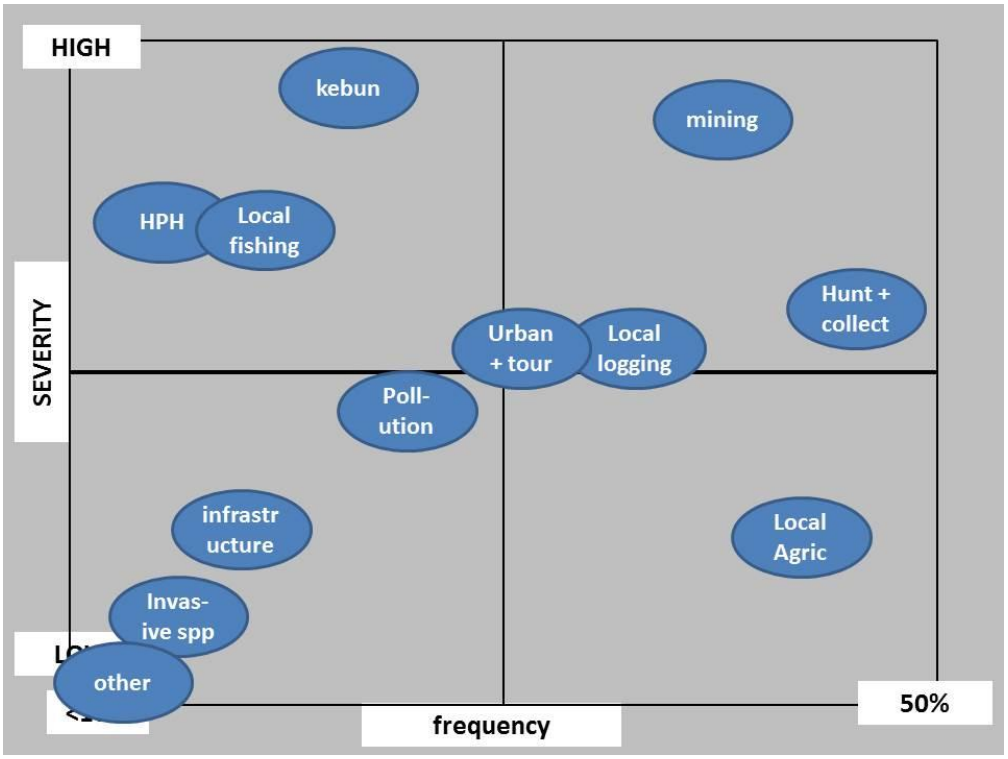
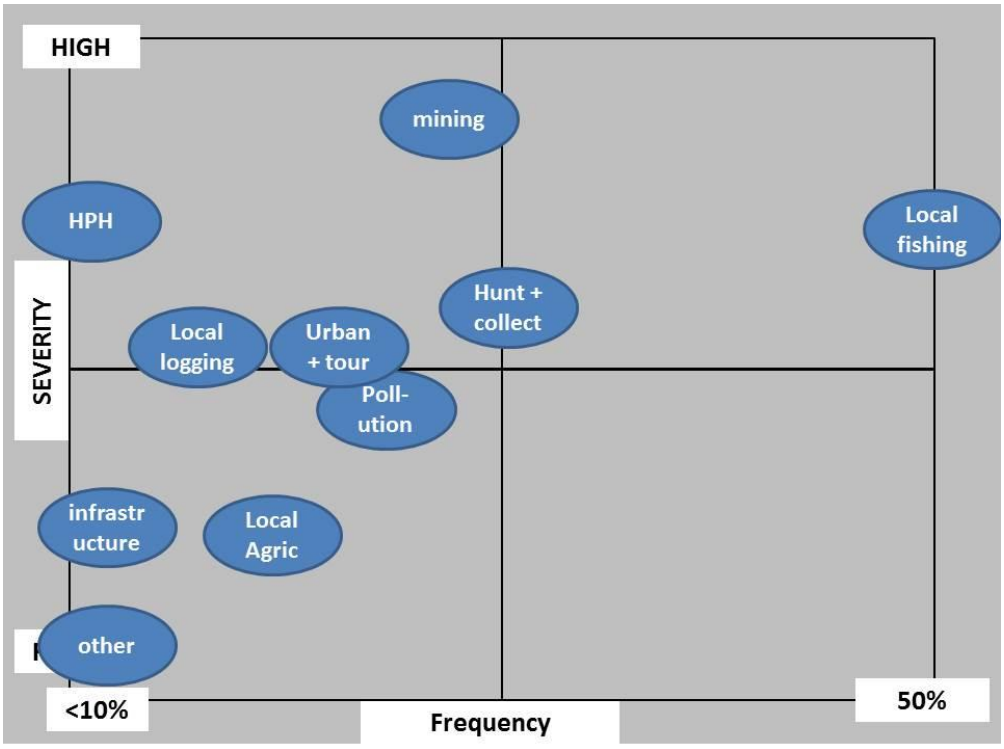


Figure 8.3. Frequency vs Severity of at 49 Marine KBAs



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 central Sulawesi–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.

Data on the type and legality of the mining is incomplete, but that which is available shows 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.

8.3.4 Forest Loss in Indonesian Terrestrial KBAs: Comparison of Land Cover Mapping from 2000 and 2011

Land cover data for 228 of the 251 terrestrial KBAs was obtained from the Ministry of Forestry's land cover maps for 2000 and 2011. Thirteen of these had no forest in 2000 and so were excluded from the analysis, leaving a sample of 215 KBAs. For simplicity, land cover classes were grouped into "forest" and "nonforest."

The analysis uses the identified KBA boundaries, but these boundaries are potentially the cause of bias, as some KBAs use a protected areas boundary, which is fixed independently of any changes of vegetation on the ground; the definition of KBAs outside protected areas often used the margins of forest visible on satellite images as a reference. Areas deforested over the last decade are likely to be excluded from the KBAs outside protected areas, and thus comparison of forest cover between 2000 and 2011 may show little change, when in fact there may have been considerable change in the wider landscape, which may imminently threaten the KBA.

Finally, in considering deforestation figures, it is useful to look at both actual area deforested and percentage deforestation. The former allows comparison of rates of change between KBAs without introducing the bias of the size of the KBA (1,000 hectares of deforestation will be a much higher percentage of a 10,000 hectare KBA than a 1,000,000 hectare KBA), while the use of the percentage of forest loss allows the figure to be seen in the context of the individual KBA.

8.3.5 Deforestation in KBAs

The total area of forest in the 251 KBAs in 2000 was 6.5 million hectares. This decreased by 143,310 hectares to 6.4 million by 2011, a loss of about 14,000 hectares per year or 0.2 percent per year.

The largest losses by area were experienced by Pulau Selayar (South Sulawesi), which lost 19,974 hectares of forest, Pegunungan Tokalekaju (Central Sulawesi), which lost 18,014 hectares, and Puncak Ngengas (West Nusa Tenggara), which lost 13,679 hectares. Twenty-three KBAs lost between 1,000 and 10,000 hectares of forest, 46 between 100 and 1,000, and 143 KBA recorded losses of less than 100 hectares; in 108 cases, there was no loss at all. No KBAs gained forest cover during the decade.

In addition to Pulau Selayar, mentioned above, which lost 99 percent of its forest, three KBAs lost all of their forest during the decade: Lembeh (North Sulawesi), Puncak Botu (Gorontalo, Sulawesi) and Danau Tondano (North Sulawesi). These three sites held very little forest in 2000, and the figures highlight the need to verify the persistence of the species for which they were identified. Two other KBAs suffered deforestation of more than 25 percent of their area during the decade: Tanjung Panjang (Gorontalo, Sulawesi, 77 percent deforestation) and Gunung Sahendaruman (North Sulawesi, 66 percent deforestation). The Gunung Sahendaruman deforestation is worrying because the mountain supports five critically endangered species, one of them recorded only from the mountain, and six other globally threatened species. However, the data requires ground-truthing, and highlights the difficulty of distinguishing forest from mature mixed gardens using imagery alone.

Nine KBAs lost between 10 percent and 25 percent of their forest during the decade. This high rate of forest loss means the site is highly threatened if the processes driving the loss continue to operate. The sites are in Central and North Sulawesi and Gorontalo, with the exception of two in Nusa Tenggara. A further 60 KBAs experienced deforestation of 1 percent to 9 percent, and 140 had deforestation of less than 1 percent over the decade, or recorded none at all. Surprisingly, one of the largest sites, Lore Lindu, recorded zero deforestation during the period. This is clearly not correct and highlights the problem of relying on this data for more than a broad indication of changes in land use.

There were differences in the scale of deforestation between the regions. Deforestation in KBAs in Maluku (n = 65) amounted to 15,262 hectares over 10 years, or 1.0 percent of the 2000 forest cover. Nusa Tenggara (n = 42) lost a slightly higher area — 20,871 hectares — but this constituted a higher percentage, 2.3 percent, of the regions much sparser forest resources. Combining the two provinces disguises a dramatic difference — 4.3 percent deforestation in West Nusa Tenggara and only 0.5 percent in East Nusa Tenggara — which begs confirmation and explanation. Sulawesi (n = 90) accounted for 75 percent of forest loss by area: 107,177 hectares, but this amounted to only 2.6 percent of Sulawesi's much larger forest area. Forest loss was not distributed evenly across Sulawesi. The greatest area deforested was in Central Sulawesi, where a loss of 38,137 hectares over 10 years is equivalent to a 2.3 percent loss. The second highest was South

Sulawesi, where the loss of 24,241 hectares amounted to 10.0 percent of the provinces already depleted forest cover. North Sulawesi and Gorontalo are also a center of deforestation, together losing 22,688 hectares of forest, or 3.2 percent.

8.3.6 Impact of Protected-Area Status on Deforestation

All 251 Terrestrial KBAs were classified as protected (more than 90 percent of the area of the KBA is a legally protected area), partially protected (more than 10 percent to less than 90 percent of the KBA area is inside a protected area) or unprotected (less than 10 percent of the KBA is inside a legally protected area).

The analysis of deforestation using Ministry of Forestry land cover maps from 2000 and 2011 was applied to 215 terrestrial KBAs, and found that protected KBAs had a deforestation rate of 0.09 percent per year (n=18), less than half of the rate for unprotected KBAs, 0.21 percent. Partially protected KBAs (those with more than10 percent but less than 90 percent of their area inside a protected area) showed the highest deforestation rate (0.29 percent per year), suggesting that other factors than protection status are important.

Table 8.5. Deforestation in Protected, Partially Protected and Unprotected KBAs, 2000–2011

	Protected KBAs	Partially Protected KBAs	Unprotected KBAs	All KBAs
Total area forest 2000	540,804	1,485,025	4,535,988	6,561,817
Total area forest 2011	536,079	1,442,146	4,440,282	6,418,507
Loss (hectares)	4,725	42,879	95,706	143,310
Loss per year (% of 2000/10)	0.09	0.29	0.21	0.22
No. KBAs	18	50	147	215
Mean forest cover 2000 (ha)	30,045	29,700	30,857	30,520
Mean loss per KBA (ha/yr)	26	85	65	66

8.4 Link to CEPF Monitoring Framework and Long-Term Goals

Data on threat is relevant to **Indicator 6** of the CEPF Monitoring Framework (change in the threat levels to target sites). Target sites are those that fulfill the following criteria:

- Included in the list of 50 KBAs in the minimum critical network of sites (Chapter 4, Table 4.12).
- Are within one of the priority clusters identified for CEPF funding (Chapter 12).

Drawing on results of the deforestation analysis (see Section 8.6.5, "Forest Loss in Indonesian Terrestrial KBAs") and the identification of threats in stakeholder workshops and expert consultations. Table 8.6 presents a baseline of forest cover change while Table 8.7 presents data on other threats.

Table 8.6. Forest Cover Change 2000–2011 in Priority KBAs for Monitoring

	KBA Name	KBA Province	Area (ha)	Forest 2000 (ha)	Forest 2011 (ha)	Change in Forest Cover(ha)	Annual Change as % of 2000 Forest Cover
IDN134	Bantimurung Bulusaraung	Sulawesi Selatan	47,846	31,345	31,344	1	0.00
IDN096	Danau Mahalona*	Sulawesi Selatan	5,171	2,101	2,077	24	0.11
IDN073	Danau Poso*	Sulawesi Tengah	69,079	28,421	28,405	16	0.01
IDN130	Danau Tempe*, **	Sulawesi Selatan	32,024	n/a	n/a	n/a	n/a
IDN097	Danau Towuti*	Sulawesi Selatan	96,662	30,530	30,507	23	0.01
IDN095	Feruhumpenai–Matano*	SulSel/SulTeng	142,903	109,185	107,721	1464	0.13
IDN012	Gunung Sahendaruman	Sulawesi Utara	4,392	1,396	469	927	6.64
IDN138	Karaeng–Lompobattang	Sulawesi Selatan	32,814	18,825	18,418	406	0.22
IDN003	Karakelang Utara	Sulawesi Utara	32,242	20,040	19,278	762	0.38
IDN280	Komodo–Rinca	East Nusa Tenggara	61,698	17,776	16,886	891	0.50
IDN212	Manusela	Maluku	248,077	222,194	221,366	828	0.04
IDN284	Mbeliling–Tanjung Kerita Mese	East Nusa Tenggara	33,549	16,825	16,825	0	0.00
TLS010	Mundo Perdido**	Timor-Leste	25,899	n/a	n/a	n/a	n/a
TLS001	Nino Konis Santana**	Timor-Leste	67,483	n/a	n/a	n/a	n/a
IDN199	Pulau Buano	Maluku	13,616	4,950	4,950	0	0.00
IDN015	Pulau Siau	Sulawesi Utara	11,662	3,207	2,894	313	0.97
IDN288	Ruteng	East Nusa Tenggara	40,744	32,450	32,351	99	0.03

*: Note that the freshwater lake system deforetsation is important but not an adequate indicator of the status of the KBA, and further indicators should be developed.

**: Data is not currently available for these KBAs and need to be compiled.

Table 8.7. Threats Recorded in Priority KBAs

	KBA Name	hunt-coll	Ind Ag-For	Ind Log	Infra	Inv Spp	Local Ag-Lvsk	Local fish	Min-oil	Poll-sed	Small Log	Urb-tour
IDN134	Bantimurung Bulusaraung	1					1		1			
IDN096	Danau Mahalona						1		1			
IDN073	Danau Poso											1
IDN130	Danau Tempe									1		
IDN097	Danau Towuti					1	1		1	1		
IDN095	Feruhumpenai–Matano		1				1		1			
IDN012	Gunung Sahendaruman											
IDN138	Karaeng–Lompobattang	1	1						1			1
IDN003	Karakelang Utara											
IDN280	Komodo–Rinca											
IDN212	Manusela	1										
IDN284	Mbeliling–Tanjung Kerita Mese								1			
TLS010	Mundo Perdido						1				1	
TLS001	Nino Konis Santana	1									1	
IDN199	Pulau Buano											
IDN015	Pulau Siau				1		1					1
IDN288	Ruteng											1
	Total no. of occurrences	4	2	0	1	1	6	0	6	2	2	4

9. CLIMATE CHANGE ASSESSMENT

At the international level, numerous studies have examined the links between climate change and biodiversity, including the Intergovernmental Panel on Climate Change (IPCC 2002). Among its findings that are relevant for the discussion here are that human activities have caused and will continue to cause a loss in biodiversity; habitats of many species will move poleward or upward from their current locations; the risk of extinction will increase for many species that are already vulnerable; and changes in biodiversity at the ecosystem and landscape scale in response to climate change and other pressures would further affect global and regional climate (IPCC 2002).

These findings have particular resonance for Indonesia, given its high level of biodiversity, especially in Wallacea. Specific areas of Indonesia and Timor-Leste are highly vulnerable to multiple climate-change hazards. A warming climate will bring intense rainfall, and sea-level rise will threaten food security, health, water resources, farming and coastal livelihoods, a wide variety of life forms in forests and the oceans (World Bank 2009). The Asian Development Bank (ADB 2009) projects that by the end of this century, climate change will cost Indonesia between 2.5 percent and 7 percent of its GDP. 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.

This chapter uses a climate-modeling software and data from the meteorology unit of the Bandung Technical University (ITB) to develop climate projections for Wallacea until 2033 and their implications for biodiversity in Wallacea.

9.1 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 23^0C to 28^0C throughout the year, and are highest during the rainy season when water vapor in the atmosphere traps long-wave energy reflected from the Earth.

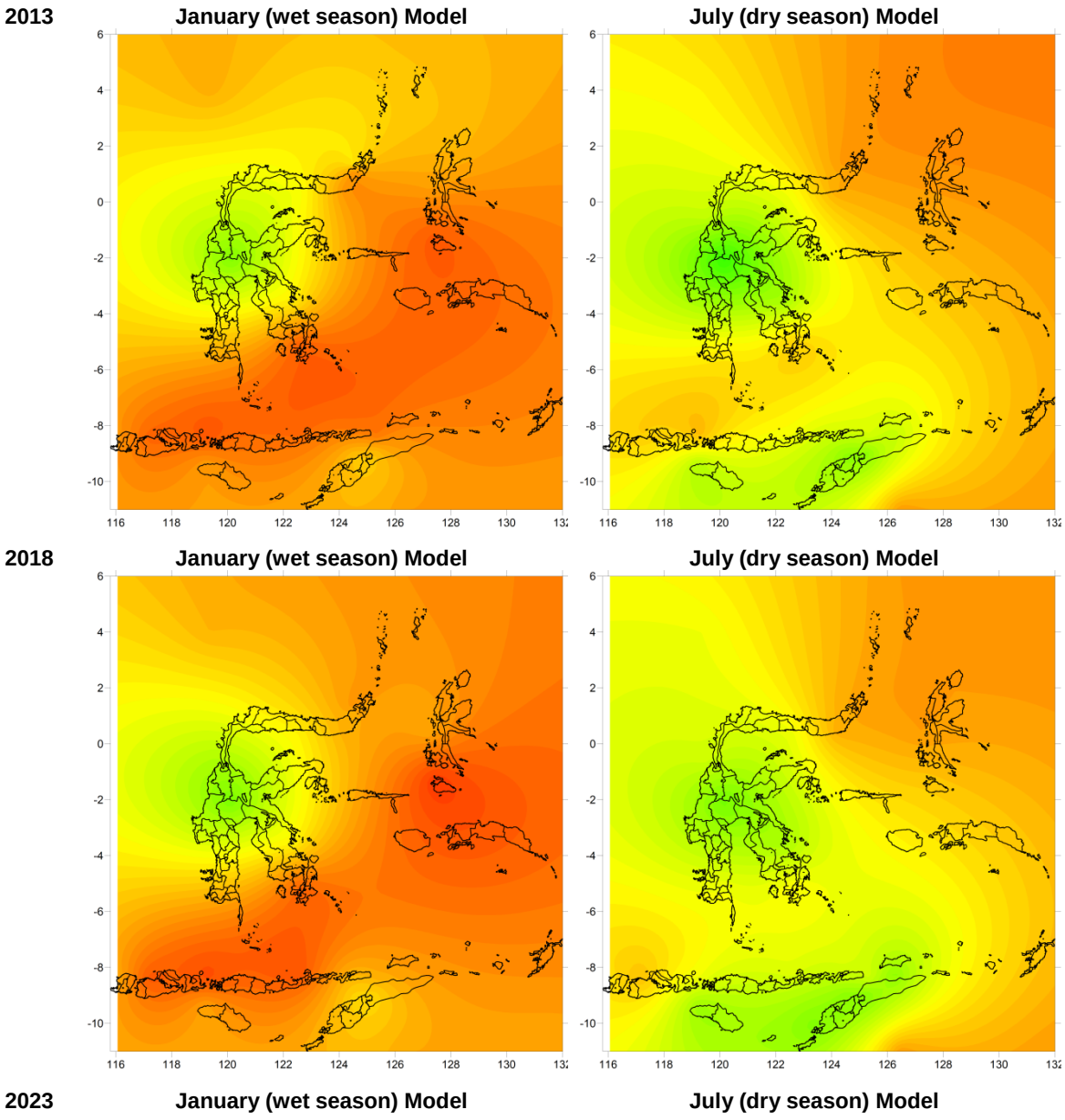
Rainfall in the region averages 1,600 millimeters a year, but also greatly varies, from more than 7,000 millimeters a year in some places in North Sulawesi and North Maluku to about 500 millimeters a year in the area of Palu.

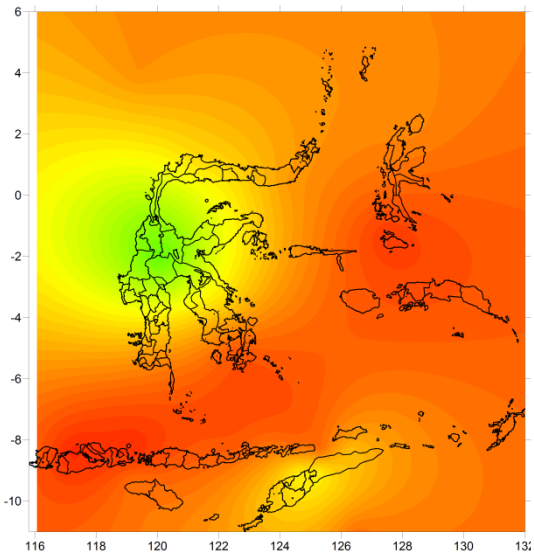
9.1.1 Model of Climate Change

Climate modeling results provide projections of the two main climatic parameters that directly or indirectly impact on the environment and biodiversity, i.e., temperature and

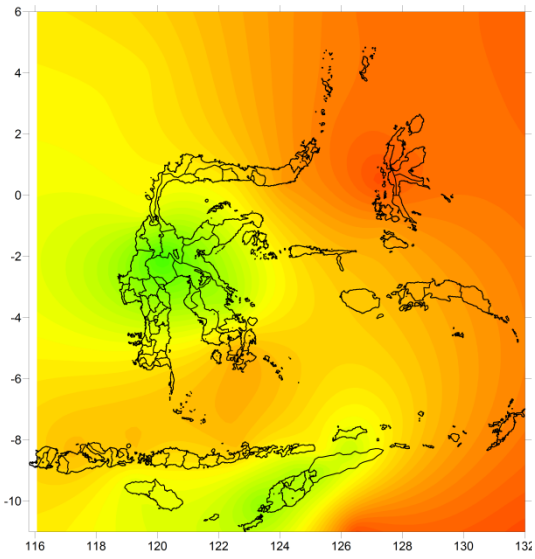
precipitation. Projections of climate (temperature and precipitation) are made in five-year intervals up to 2033 for the two main seasons, the rainy season represented by January, and the dry season represented by July.

Figure 9.1. Temperature Projections for Wallacea

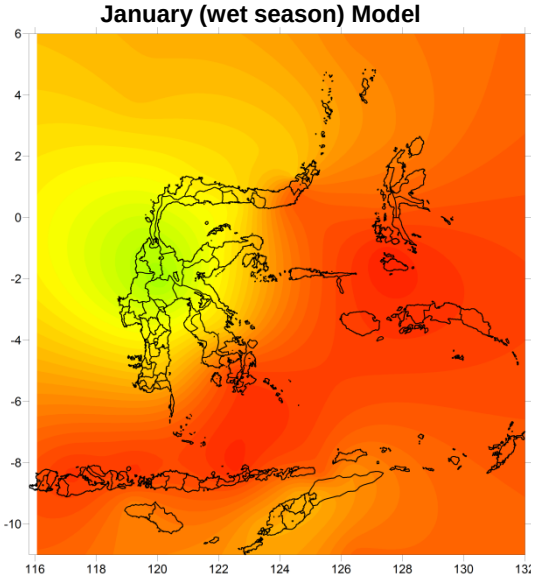




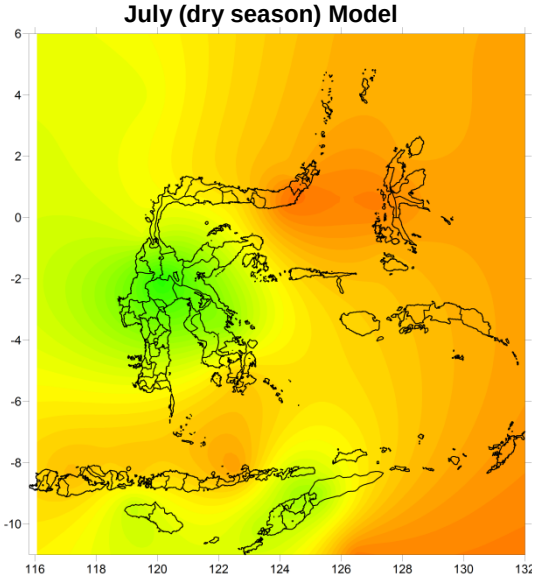
2028 **January (wet season) Model**



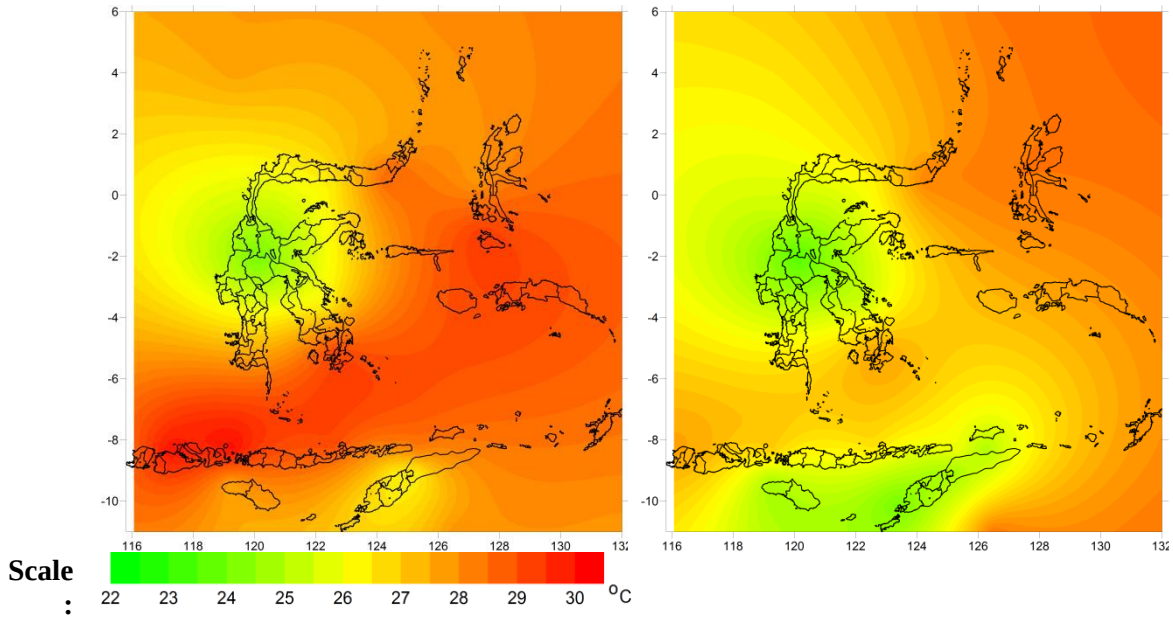
July (dry season) Model



2033 **January (wet season) Model**



July (dry season) Model

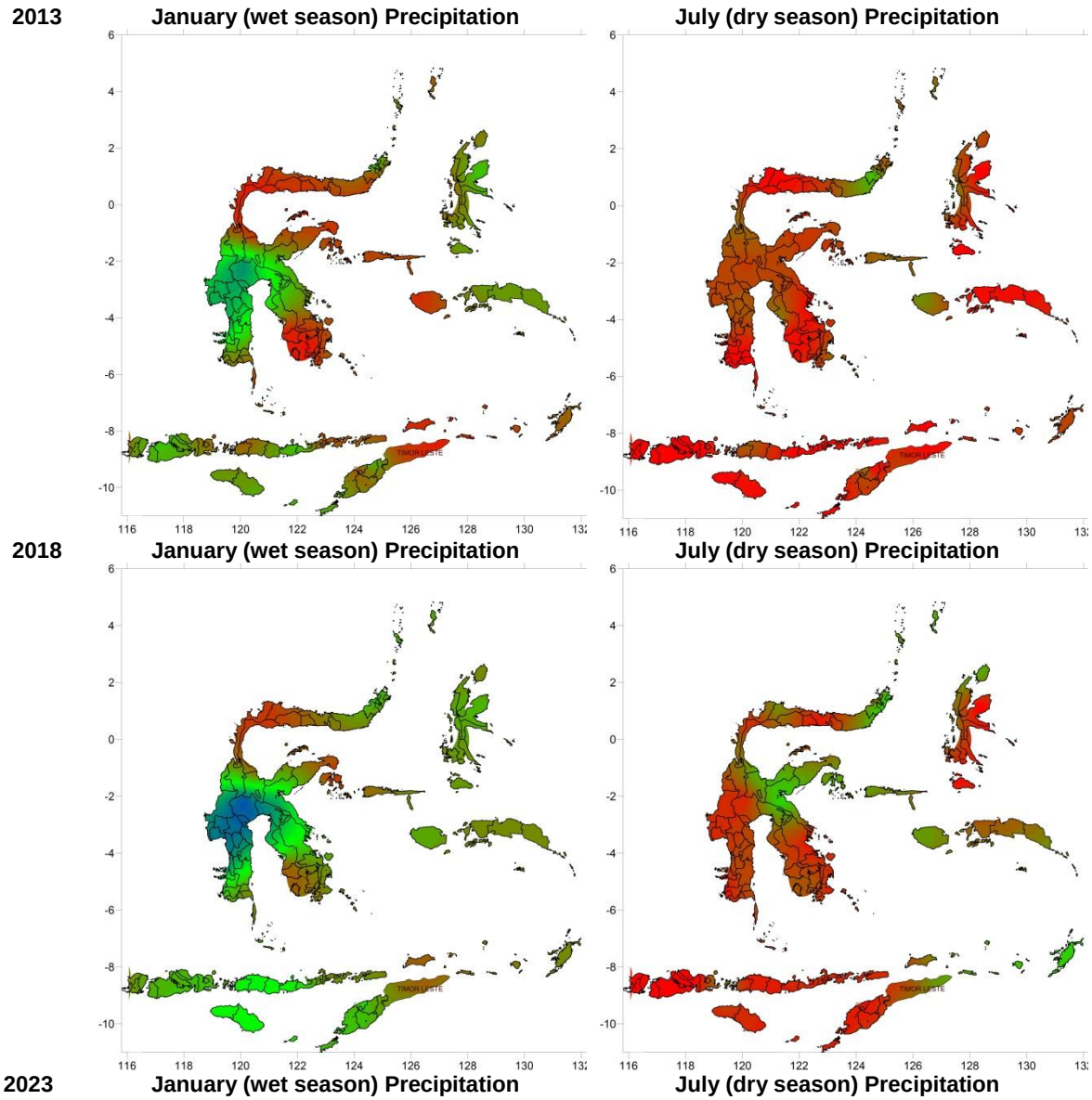


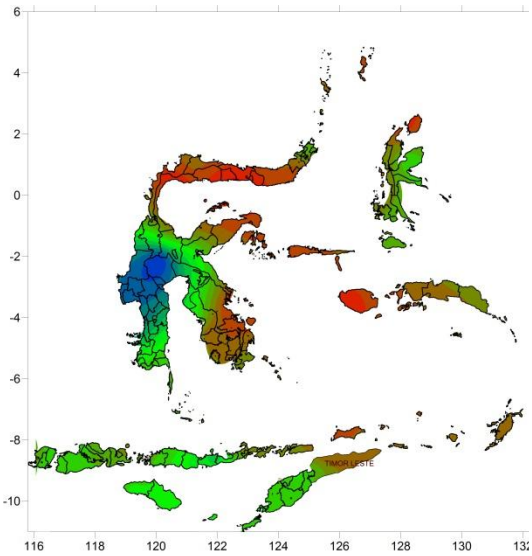
The climate model shows that in the wet season, January, much of Wallacea experiences uniformly high temperatures, with lower temperatures in Central and West Sulawesi and Timor. This pattern remains broadly the same until 2033. In the dry season (July) by contrast, the model shows that presently there 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 a gradual reduction in this area of cooler temperatures, with the hot areas becoming hotter, and eastern Sulawesi and most of the Lesser Sundas experiencing increasingly hot, dry seasons.

9.1.1.1 Rainfall Projections

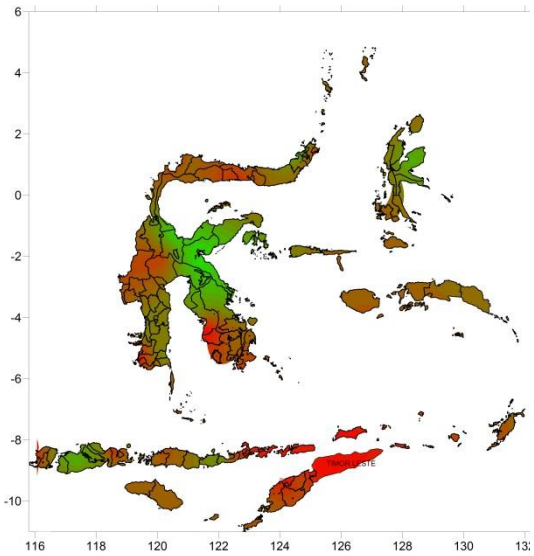
Climate models are used to produce precipitation projections until 2033 for the months of January (rainy season) and July (dry season). At present, in January, southern and Central Sulawesi are the wettest areas, with Halmaera, Seram and the islands of the Lesser Sundas less wet. Northern Sulawesi, Buru, Timor-Leste and the islands of the Banda Arc have the lowest rainfall during this period. The projections from the climate model show intensification of wet season rainfall in the wet areas, primarily Central Sulawesi. It also shows a general increase in rainfall across the hotspot initially, but after 2020 a decrease 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.

Figure 9.2. Rainfall Projections for Wallacea

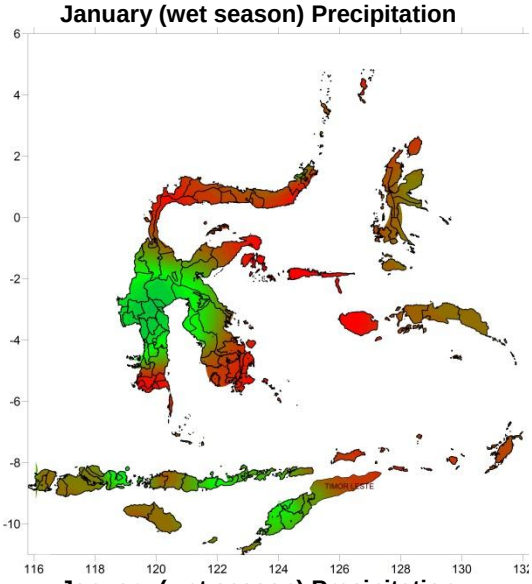




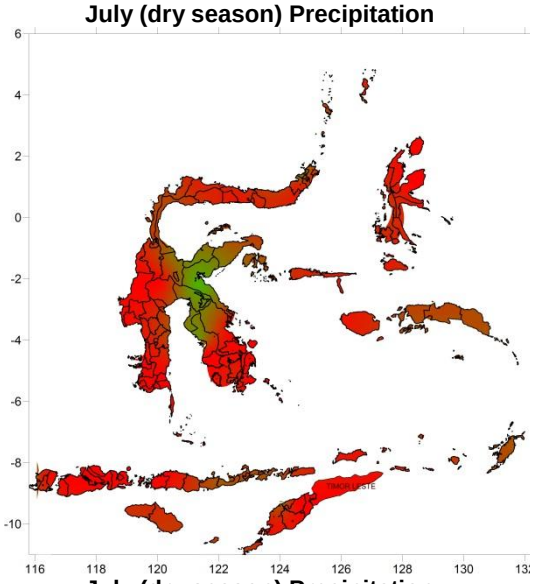
2028 **January (wet season) Precipitation**



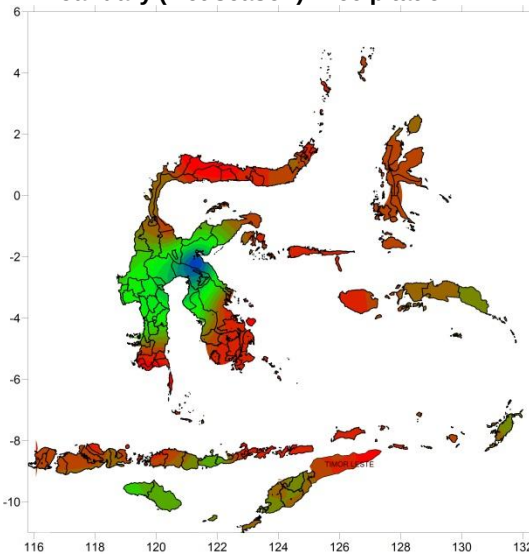
July (dry season) Precipitation

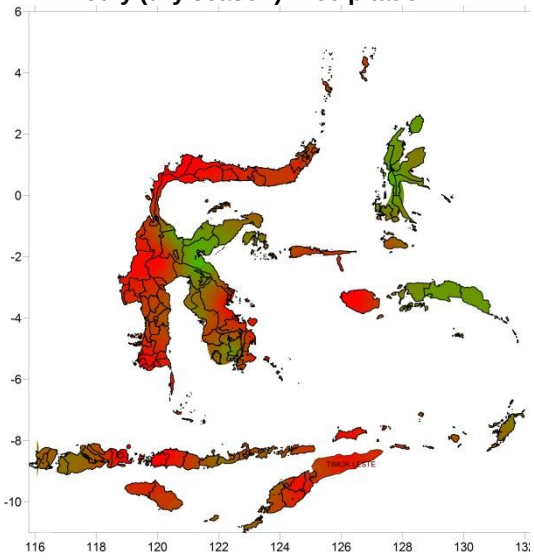


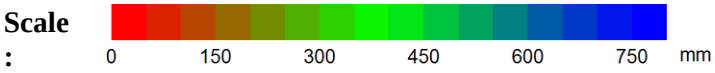
2033 **January (wet season) Precipitation**



July (dry season) Precipitation







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, north Maluku and eastern Sulawesi. The impacts on vegetation and agriculture may be somewhat offset by a predicted increase in rainfall for East Sulawesi and North 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 percent to 80 percent decreases in rainfall by 2070, increased temperature and greater variability unpredictability. They note, 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" (p. 373).

9.2 Impacts of Climate Change on Biodiversity

Global warming has a direct impact on sea surface temperatures. Rising sea surface temperatures interfere with the relationship between the coral polyp and its symbiotic algae, leading to the bleaching and death of the coral. From these projections, Maluku and Nusa Tenggara are the area's most likely to suffer bleaching. This is likely to cause disruption of fisheries and fish habitat.

In terrestrial environments, drier, hotter conditions also increase the risk of forest and grassland fires. West Nusa Tenggara, East Nusa Tenggara and Maluku will be particularly prone to a greater fire risk. Changes in temperature and rainfall influence the distribution of plants, parasites and diseases, and so affect the suitability of a place as a habitat for a specific species. Some species may have the option of following vegetation zones as they move "upslope," but for many there will be no spatial options. 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 not adequate to allow modeling of these impacts, and so the precautionary approach is required — maintaining habitat patches that are as large as possible, and especially maintaining connectivity between patches.

9.3 Social and Economic Impacts of Climate Change

Increases in temperature, and especially temperature differenes between land and sea, cause stronger winds and larger waves. Local fisherman in Wallacea already experience periods during the northwest monsoon when they cannot go to sea to fish, and it may be that these condition wll become more frequent or less predictable.

Temperature patterns are also associated with the distribution patterns of mosquitoes, which are the vectors of malaria. Malaria transmission will not occur below 16ºC or above 33ºC, and proliferation of Malaria occurs when optimum temperatures of around 28ºC enable larvae and adults to develop. Human populations already show the impacts of this. In Sumba, for example, populations in the 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.

One of the possible impacts of climate change is increased intensity of rainfall. Many areas in Wallacea have friable soils and steep topography, which make them vulnerable to landslides, blocking roads and damaging farmland and property.

Climate change will affect agriculutural 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 mm to 172 mm will increase the spread of the bacterial leaf blight in rice (Merliyuanti, *et al.* 2013). These pests could occur in several regions, including North Central Timor, East Sumba, South 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 an upslope exists as an option — almost certainly bringing farmers into conflict with forest conservation regulation, and further undermining efforts to stabilize fragile water catchments.

9.4 National and Regional Climate Change policies, Institutions and Programs — Indonesia

Indonesia is a major emitter of carbon dioxide, the vast bulk of it coming from land use and forest change. Emission reductions, and specifically REDD+, has been a major political issue since the UNFCCC COP in Bali in 2007, when the country established its National Council on Climate Change. In September 2009, Indonesian President Susilo Bambang Yudhoyono made a speech at the G20 Leaders Summit in Pittsburgh, Pennsylvania, in the United States, where he committed to reduce Indonesia's emissions

by 26 percent, compared to the predicted BAU level by 2020, or by 41 percent with international support. On May 26, 2010, the president's commitment was followed by the signing of a letter of intent (LoI) between the governments of Indonesia and the Kingdom of Norway on cooperation on reducing greenhouse gas emissions from deforestation and forest degradation. The government's first action under the LoI was a moratorium on the issuing of new licenses for concessions on peatlands and in primary forests. The moratorium, which is implemented based on a map showing where the "no go" areas are, was renewed in 2013 for a further two years.

The LoI sets out a three-stage process for the disbursement of $1 billion in assistance to Indonesia, starting with putting in place the mechanisms and institutions for emissions reduction, with the final tranche to be dependent on verified emissions reductions. While progress has been slower than envisaged (stage two started in January 2014), the LoI promoted the establishment of a national REDD+ task force under the influential Presidential Office for Supervision of Development. The task force initiated a highly inclusive process of developing strategy and policy, resulting in the production of Indonesia's REDD+ strategy, and a design for a permanent funding mechanism for REDD+. Importantly, the REDD+ task force and the REDD+ strategy recognized that a lack of certainty over forest and land tenure, and weak control over licensing of land use, were fundamental impediments to the creation of an effective national REDD scheme. The REDD+ agenda has, therefore, broadened to address basic and long-standing issues of forest governance in Indonesia, including the customary rights and lack of adequate safeguards and transparency in issuing of licenses for development. In parallel, and according to some observers, in competition with the REDD+ task force, the Ministry of Forestry has issued a series of regulations on approval of REDD+ pilot projects and the licensing of REDD+. The National Development Agency (*Bappenas*) has also published its own road map for climate change response, and prepared a national plan for greenhouse emissions reductions. Provinces were also required to establish a REDD+ task force and develop regional emissions reductions plans.

Activities at the provincial level have focused on nine high carbon provinces, of which Central Sulawesi is the only one in Wallacea (the others are in Sumatra, Kalimantan and Papua). These provinces have established their own REDD+ task forces, developed provincial REDD+ strategies, and participated in capacity-building and planning sessions.

Despite this activity, actual changes on the ground to reduce emissions have been few, with the initiative for change being led, not by government, but by a small number of private sector entrepreneurs, some involved for purely commercial reasons and others combining a desire to contribute to forest conservation with a business approach. Most of these projects have attempted to secure rights over forests within the national forest estate by applying for "ecosystem restoration" concessions. There are also a number of bilateral and multilateral REDD+ preparedness/pilot projects (Table 9.1) that use traditional aid budgets and approaches to test elements of a "REDD+ approach."

The REDD process at national and subnational levels is largely driven by international funding.[67] The same applies to REDD pilots that are found in several provinces and which are prepared and implemented through bilateral or multilateral cooperation agreements, by NGOs or the private sector. In an effort to coordinate this funding and establish a permanent source of investment for REDD, the Indonesian REDD+ task force, together with partners, has developed the Indonesia REDD Fund (FREDDI). FREDDI has been designed and will be established when the national REDD agency is created. It is designed to be a "funder of funders," providing a number of flexible windows for project proponents to access funding.

As of early 2014, the REDD+ policy situation in Indonesia is dynamic. The creation of a full REDD+ agency (Badan Pengelolaan REDD+ or BPREDD) in August 2013 as a permanent replacement for the temporary task force signaled the start of the second phase of the LoI and allowed release of further funding from Norway. Those funds will be spent, it is thought, at least partly on activities to change land use on the ground, and a funding mechanism to allow funds to be channeled to project proponents is being developed. Still, the REDD+ agency remains a body outside of the formal government structures, created by a presidential regulation (Peraturan Presiden 62/2013). The future existence and influence of the agency is highly dependent on the policies of the next Indonesian president, who will be elected in mid-2014.

Table 9.1. REDD+ and Climate Change-related Projects in Wallacea

Project Name	Developers/ Implementers	Location (KBA status)	Aims
Korea-Indonesia joint project for adaptation and mitigation of climate change in forestry–REDD+ Project (KIPCCF)	Korean Bilateral Aid (KOICA), Ministry of Forestry Research Agency (FORDA); provincial government of West NT; district government of Central Lombok	Central Lombok, West Nusa Tenggara (not known to be in a KBA)	Contribute to emissions reduction and community development over an 8,000 ha site
Mitigation of climate change through promotion of community-based economic growth	KYEEMA Foundation, funded by AusAID, working with local CSOs Yayasan Peduli Sanlima (SANLIMA) and Yayasan Timor Membangun (YTM)	Mutis-Timau Forest Complex, Timor, East Nusa Tenggara (KBA)	Community-based forest management concessions to resolve tenure issues, enable communities to access carbon funding
Mamuju habitat	KeeptheHabitat, Inhutani I	Mamuju District, West Sulawesi Province (Probably in a KBA)	13,270 hectares, managing 24 million tons of carbon, protect the remaining 13,270 ha of virgin rain forest located in Mamuju District, West Sulawesi, and to engage the community and local business to rehabilitate logged-over and degraded forest areas.

[67] CIFOR (2013) *Realizing REDD.*

Nantu Forest Conservation	Gorontalo University, YANI–Yayasan Adudu Nantu Internasional, ADM Capital Foundation (ADMCF), Starling Resources	Nantu Forest, Gorontalo [KBA]	Protection of the Nantu forest complex. 62,6331 Hectares
Forest land use and climate change in North Sulawesi (FLUCC) in the Poigar Forest	Office National des Forets–International (ONF-I) (France), French NGO Green Synergies, Province of North Sulawesi	North Sulawesi, Bolaang Mongondow and South Minahasa Districts (probably a KBA–project location not known exactly)	41,000 hectares, avoided emissions potential of 5.1 MtCO2e build capacity on payment for environmental services scheme including carbon valuation within forest land-use plans.
Carbon valuation and biodiversity conservation in Gunung Klabat and Gunung Wiau Forests	North Sulawesi, North Minahasa District and Bitung City	Gunung Klabat and Gunung Wiau [KBA]	13,000 ha, potential avoided emissions 4.9MtCO2e per year
Gorontalo Landscape Development and Forest Restoration Program	Burung Indonesia, funded by KfW/BMU (Germany)	Popayato-Paguat forest, Pohuwato and Boalemo Districts, Gorontalo (KBA)	Forest restoration and conservation, secure corridors to connect 256,000 hectares of forest
Indonesia–Germany Forest and Climate Program (FORCLIME III)	Ministry of Forestry, with support of BMU/KfW (Germany)	Lora Lindu National Park and the Miu Watershed (KBA)	Protected Area management and integrated watershed management in the buffer zone

Source: http://forestclimatecenter.org/. Accessed Feb. 28. 2014.
http://www.thejakartapost.com/news/2014/02/13/burung-indonesia-begins-ecosystem-restoration-program-gorontalo.html. Accessed Feb. 28, 2014.

9.4.1 REDD+ in Central Sulawesi

Central Sulawesi was selected as pilot province by the UN-REDD agency in 2010. A governor's decree issued in 2011 established a multistakeholder REDD working group for the province and identified five areas for implementation. Norway is reported to have provided $2.95 million for the first year of the program in 2010-2011.[68] The UN-REDD program closed in October 2012. Achievements of the program in Central Sulawesi include the establishment of a methodology for setting reference emission levels, development of a REDD implementation plan for Central Sulawesi, and trialing of free prior informed-consent mechanisms.[69]

9.4.2 Biodiversity and REDD+

The debate on REDD+ in Indonesia has paid little attention to the issue of biodiversity conservation, which is only mentioned as a co-benefit of REDD+ and a concern of the donor agencies. There is, however, increasing interest in developing models of REDD+

[68] http://www.forestpeoples.org/sites/fpp/files/publication/2011/10/central-sulawesi-briefing-4.pdf Accessed Feb. 28, 2014.
[69] http://www.un-redd.org/Key_results_achievements_Indonesia/tabid/106623/Default.aspx. Accessed Feb. 28, 2014.

relevant to protected areas. WWF-Indonesia is working on this in a national park in Kalimantan, and the planned KfW Forclime III project in and around Lore Lindu should go some way to demonstrating how conservation management and emissions reductions can be integrated.

9.5 National and Regional Climate Change Policies, Institutions and Programs — Timor-Leste

In contrast to Indonesia, the debate on climate change in Timor-Leste has not focused on securing funding from REDD+ schemes (the potential for REDD+ in Timor-Leste is, presumably, very limited), but on the risk of increasing food and water insecurity as a result of the predicted increases in temperature and rainfall unpredictability. Timor-Leste has prepared a national climate adaptation plan, but otherwise has not yet created institutions or mechanisms to address climate change specifically.

10. ASSESSMENT OF CURRENT CONSERVATION INVESTMENT

In Indonesia, government provides around $30 million per year for conservation in Wallacea to cover the management costs of 15 national parks and the operations of seven offices of the Natural Resourcs Conservation Agency (KSDA). Donor support is perhaps a third of this figure, most of it from foundations supporting marine conservation. Much larger sums are spent on community development and welfare projects, many of which address enviromental issues as a development problem. There is little support of any kind for 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.

10.1 Indonesia

10.1.1 Investment by Source

10.1.1.1 Ministry of Forestry Financing for Protected Areas and Wildlife Conservation

The largest direct investment in conservation by government is by the Forest Protection and Nature Conservation Directorate (PHKA) of the Ministry of Forestry. In 2013 PHKA spent a total of $30.4 million (IDR 304 billion) for the management of 15 national parks and the seven provincial level natural resource conservation units (Balai KSDA) in Wallacea. Ecosystem management staff, extension staff and forest police are employed within these units. Table 10.1 provides a breakdown per site and subregion.

Table 10.1. 2013 Expenditure and Staff Allocations for National Parks (NP) and Natural Resource Conservation Units (KSDA) in Wallacea

National Park/Regional Unit	Area	Expenditure, 2013 ($)*	Staff Allocation, 2013**
West Nusa Tenggara KSDA	124,317	1,688,257	56
Gunung Rinjani NP Unit	37,225	1,130,654	54
East Nusa Tenggara KSDA	121,226	2,323,090	57
Kelimutu NP Unit	5,424	913,709	24
Komodo NP Unit	179,276	1,881,661	41
Laiwangi–Wangameti NP Unit	37,809	886,112	26
Manupeu–Tanadaru NP Unit	46,898	811,728	28
TOTAL Nusa	**552,175**		**286**

National Park/Regional Unit	Area	Expenditure, 2013 ($)*	Staff Allocation, 2013**
Tenggara		**9,635,210**	
North Sulawesi KSDA	159,835	1,597,403	30
Bogani Wartabone NP Unit	274,022	1,335,482	64
Bunaken NP Unit	n/a	1,090,607	32
Lore Lindu NP Unit	205,083	1,513,176	54
Central Sulawesi KSDA	374,931	1,419,030	46
Togean Islands NP Unit	n/a	791,095	27
Southeast Sulawesi KSDA	184,008	1,573,687	49
Rawa Aopa NP Unit	111,396	1,412,403	39
Wakatobi NP Unit	n/a	1,098,396	40
South Sulawesi KSDA	225,340	2,684,454	126
Bantimurung NP Unit	44,601	1,166,845	44
Taka Bone Rate NP Unit	n/a	1,158,719	40
TOTAL Sulawesi	**1,579,216**	**16,841,297**	**591**
Maluku KSDA	203,726	1,898,135	46
Manusela NP Unit	163,174	1,038,887	37
Aketajawe–Lalobata NP Unit	324,815	1,008,895	30
TOTAL Maluku	**691,715**	**3,945,917**	**113**
TOTAL Wallacea	**2,823,106**	**30,422,424**	**990**

*Converted from the rupiah figure at 10,000 IDR: $1.
**Includes ecosystem managers (Pengendali Ekosistem Hutan), extension staff (Penyuluh Kehutanan) and Forest Police (Polisi Kehutanan).

Source: Written data provided by the Program and Evaluation Section of Forest Protection and Nature Conservation Directorate, Ministry of Forestry, Feb. 18, 2014.

The funding for the 11 terrestrial national parks in Wallacea (excluding four marine national parks—Bunaken, Take Bone Rata, Togean and Wakatobi) amounts to $13.1 million or $9.16 per hectare. For the non-national park protected areas, the funding averages almost the same, $10 per hectare, assuming that all the funds allocated to the KSDA units are for management of protected areas, which is not the case. In terms of staff, national parks have one staff member for 3,242 hectares, and non-national park protected areas have one staff member per 3,213 hectares of the KSDA units. The national parks, however, are generally large, consolidated units with a low boundary-area ratio and a dedicated office based close to the site, while non-national park protected areas are smaller, fragmented, and often remote from the KSDA office in the town. It is,

therefore, reasonable to conclude that national parks are more likely to have effective management. The allocation of budget per hectare is well over the $2.97 per hectare recommended as optimal funding for all national parks in Indonesia (Ministry of Environment 2006), but the staff allocation is well below the recommended 1 to 1,000 hectares (ibid).

In the past, bilateral and multilateral donor projects have provided additional management funding for protected areas (e.g., USAID for Bunaken, ADB for Lore Lindu, GEF for Aketajawe-Lalobata, Karakelang Wildlife Reserve), but as of November 2013, only one project was being implemented: a Japanese government support to PHKA, which includes a national park on Sumba. Two projects are expected to start in North Sulawesi in 2014 or 2015: a full-size GEF project in four sites, and a component of the Germany-Indonesia Forest and Climate Change Program (FORCLIME), in and around Lore Lindu National Park. Further details are in the "Bilateral" and "Multilateral" donor sections, below.

10.1.1.2 Central Government Special Funds for the Environment (DAK-LH) and Forestry (DAK-Kehutanan)

Special Allocation Funds (Dana Alokasi Khusus, 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 2012 the total allocation was just over $2.6 billion (IDR 26 trillion[70]). Of this amount, 1.8 percent went to the Ministry of Environment to be disbursed to provincial and district environment agencies, and 1.9 percent to the Ministry of Forestry for their forestry counterparts in the regions. In contrast, the Ministry of Education received 38.4 percent, and 15.4 percent went to the Ministry of Public Works.

The Environment DAK (DAK-LH) allocation is intended to fund activities that are part of the district's responsibilities according to Law 32/2004 on the Environment, and in support of national objectives. In 2012, funding was targeted toward strengthening the capacity of district level government agencies that are active in environmental management to achieve minimum service standards, monitoring the activities of industries (mining, oil, gas and agriculture) and taking part in the construction of parks in urban settings. The 2012 maximum annual payment of DAK-LH was approximately $200,000 (IDR 2 billion) per local government. Participating regions were expected to contribute an additional 10 percent as a sign of their commitment to the program.[71] In 2014, the Ministry of Environment plans a total of $54.8 million (IDR 548 billion) for all district governments through the DAK-LH.

[70] Figures for DAK allocation from Ministerial Regulation 209/PMK.07/2011 available at http://emonitoring.pu.go.id/download/app_emondak/TA%202012/PMK%20209_07_2011%20ttg%20Alokasi%20DAK%202012.PDF, downloaded April 7, 2014

[71] http://www.menlh.go.id/dana-alokasi-khusus-bidang-lingkungan-hidup-tahun-anggaran-2012/

DAK from the Forestry Ministry is allocated for water, soil and forest conservation and rehabilitation, implemented through provincial and district forestry agencies, and through the regional offices of the Water Catchment Management Coordination Agency (BP-DAS). In 2013, $39 million was allocated for a variety of activities with a target of 2.8 million hectares of land, the largest allocations being $14 million for the greening and rehabilitation of almost 2.2 million hectares; however, field staff report that they face delays in release of funds and limitations in implementation capacity, including in some areas, difficulties in finding enough land to rehabilitate. As a result, in 2013, only about a fifth of the available funding was used — $7.3 million expended for the rehabilitation of 645,735 hectares of land.[72]

10.1.1.3 Bilateral Funding

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. According to OECD — DAC, Indonesia received $415 million in foreign aid in 2011, one-third of the aid received in 2010 and 2009, and equivalent to only 0.1 percent of gross national income (compared to 9 percent for Timor-Leste). Indonesia's main bilateral donors were Japan, which provided more than $1.3 billion in aid, then Australia, the United States, Germany and France.

Government of Japan provided $1.69 billion in development aid to Indonesia in 2012[73], most in the form of loans. Some 75 percent of this aid goes into transport and energy projects, with between 5 percent and 10 percent of loans, grants and technical assistance typically allocated to forestry and environment programs. The Japan International Cooperation Agency (JICA) has a grassroots "human security" small grants program that provides 10 to 20 grants of approximately $70,000 annually for community development and livelihoods programs across Indonesia. Up to 25 projects in the education, health, communications and infrastructure sectors have been implemented in Wallacea over the last 10 years. Collaboration with PHKA in the past included capacity building for Collaborative Management by National Parks, and currently includes the "Capacity Building for Restoration of Ecosystems in Conservation Areas project" (2010–2015), in which one of the five national parks chosen is Manupeu-Tanadaru, Sumba. The project is focused on planting trees in grassland and encouraging natural succession.

Australia has in the past been a major development aid donor to Indonesia, and has a long history of work in poor regions of Nusa Tenggara. Current projects focus on education, water supplies and health throughout this region. In 2014, the Australian government announced cuts in the aid program globally, but at the same time refocused priorities on regional neighbors, with the result that the cut in aid to Indonesia is much

[72] Data on Forestry DAK from the Ministry of Forestry website, http://birocan.dephut.go.id/ppdak/
[73] JICA website. Accessed April 8, 2014.
http://www.jica.go.jp/english/publications/reports/annual/2013/c8h0vm00008m8edo-att/s02.pdf

less than in other countries.[74] Planned aid for 2013–2014 is now $498.2 million (AU$ 532.4)[75], $25 million less than the figure announced in May 2013.[76]

AudAIDs Community Development and Civil Society Strengthening Scheme (ACCESS) Phase II, was funded from 2008 to April 2014 and received $7.1 million in 2011–2012. The program train community facilitators in target communities and then provides support for local livelihoods initiatives.

USAID's Indonesia Marine Resource Program funds two major initiatives that include work in the Lesser Sunda–Banda seascapes of Wallacea. The Indonesia Marine and Climate Support program (IMACS) is a four-year (2010–2014) $20 million program aligned with the Marine Affairs Ministry's 2010–2014 strategic plan that focuses on sustainable fisheries, climate change impacts and policy development. The program included a component that awarded 42 small grants totaling $170,000.

The Marine Protected Areas Governance (MPAG) program is a US$ 8.1 million, 3 year program (2012 – 2015) assisting Indonesia to deliver on its commitment to declare and manage 20 million hectares of marine protected areas by 2020. Within Wallacea, the program focuses on the Lesser Sundas marine ecoregion (Savu Sea Marine NP, and Gili Matra, Lombok) and the Banda Sea marine ecoregion (Wakatobi, Sulawesi Tenggara, and Southeast Maluku). In addition, USAID's five country, $32 million Coral Triangle Support Partnership (CTSP) program, which ended in 2013, contributed to marine conservation in Indonesia and Timor-Leste.

In terrestrial ecosystems, USAID funds the "Agribusiness Marketing and Support Activity" (AMARTA II) program, which in Wallacea, supports cocoa farmers in Central and South Sulawesi. The $20 million program will run for five years, until 2016, and is implemented by ACDI/VOCA. It aims to support small farmers to improve productivity and quality and to link them with marketing opportunities. The program is implemented in partnership with the World Cocoa Foundation, with seven of its member companies in Indonesia, including Cargill, Mars and Hershey.

The **Millennium Challenge Corp.**, a U.S.-funded development program focused on climate change issues, has identified two districts in Sulawesi among its four focal districts in Indonesia. Funding for activities in these areas, which will include interventions related to renewable energy, spatial planning and community-based natural resource management, is expected to commence in 2014.

The **U.S. National Institute of Health** and the **U.S. Department of Agriculture's Agriculture and Food Research Initiative** have supported a long-term research collaboration between U.S. and Indonesian scientists under the International Cooperative Biodiversity Groups program in Mekongga, Southeast Sulawesi. The program includes biodiversity survey, screen microbes for medicinal and fuel potential, awareness and

[74] http://devpolicy.org/australias-overseas-aid-program-a-post-surgical-stocktake-20140203/
[75] http://aid.dfat.gov.au/Publications/Documents/program-allocations.pdf. Accessed April 8, 2014.
[76] http://aid.dfat.gov.au/countries/eastasia/indonesia/Pages/home.aspx. Accessed Feb. 21, 2014.

education, and advocacy for improved protection of the area. Mekongga is one of the largest forest KBAs and has been recommended for protected area (possibly national park) status on the basis of this work.

German bilateral aid and debt swaps have, to date, not been implemented in Wallacea; however, in 2014, the Indonesia–Germany Forests and Climate program (FORCLIME III) funded by the German Federal Ministry for the Environment (BMU) through KfW, will support PHKA and BP-DAS to implement a protected area management and watershed rehabilitation program in Sulawesi. The program, in the Palu/Miu watershed and Lore Lindu National Park, will support conservation, integrated watershed management, and community livelihoods in the buffer zone. A feasibility study for the program is expected to be conducted in 2014.

Although the **European Union** has reduced its traditional focus on the forestry sector, the EU is a significant funder of natural resource-related programs, linking them to poverty alleviation, rural development and governance. The key objectives of the 2007–2013 strategy are poverty reduction through promotion of access to education, an improved investment climate, and improved law enforcement and justice. The strategy had an allocation of $679 million (Euro 494 million) for five years. Wallacea will be included in a major EU–ADB education program that will work in 110 districts across Indonesia, and in the "SWITCH" program for sustainable production and consumption in Asia.

Once the present round of bilateral projects are completed, the EU bilateral program will be phased out, but thematic work funded directly from Brussels will continue. The 2014–2020 framework for aid includes themes of Climate Change and Biodiversity. Outside its bilateral program, the EU makes grants to civil society organizations, some for programs implemented in Indonesia.

Current EU funded projects relevant to the CEPF program in Wallacea are:

- ALLREDDI (ended in 2013)—accounting for carbon emissions from land use, adopted Gorontalo as one of five pilot provinces.

- Coastal resilience to climate change impacts (2011–2014)—in Indonesia, the project works in four districts in South Sulawesi Province. Implemented by CARE, for $2.3 million (1.7 million Euro) in total, of which an estimated $1.17 million (0.85 million Euro) is spent in Wallacea.

- Nusa Tenggara Barat water resource management program (NTB–WRMP)—improving the governance and management, $13.74 million (Euro 10 million). The time scale is not known.

- Timor Aid—$0.55 million (Euro 0.4 million) to for work on institutional capacity building and peace building between East and West Timor (2012–2015).

- Collaborative land-use planning and community rights—working with communities in the Manusela National Park (which is a KBA), Seram and Kalimantan. Implemented by CIRAD/CIFOR, 2010–2014 with a total of $2.34 million (Euro 1.7 million) for both sites.

- Work on nutmeg trade chain, shortly to be expanded to the cocoa trade chain, under the "Trade Support Program II."

- Funding for local nongovernmental organization working on ecotourism in Komodo/West Flores.

In addition, the European Union is supporting the implementation of Indonesia's Timber Legality Standard (SVLK) system, which is linked to the IndonesiaEU Voluntary Partnership Agreement on timber imports to the European Union. Projects include building the capacity of CSOs to monitor the implementation of the standard. The initiative is important for Wallacea, given the significant areas of natural forest logging concessions that still operate in the region and the expected future expansion of industrial timber plantations.

The second phase of the **British** government-funded Multi-stakeholder Forestry Program (MFP II) is supporting implementation of the SVLK with grants to civil society organizations and capacity building for industry and the agencies involved in implementation of the scheme. The program ran from 2008 through 2013. The UK's environment-related aid in Indonesia is now managed through the Jakarta based UK Climate Change Unit.

AFD is unique among bilateral donors in explicitly mentioned biodiversity preservation along with climate change and health as its three core objectives in Indonesia. In practice, the agencies work has focused on three major climate change related loans totaling US $800 million to Indonesia, and energy-efficiency promotion. Specific activities in Wallacea are not known.

The Canadian bilateral aid agency **CIDA** has been a major aid donor in Sulawesi for many years, in several sectors. Recent and ongoing projects include:

- $9.6 million, five-year Sulawesi Agroforestry project, implemented by the International Agroforestry Centre, which is working in Sulawesi Selatan and Tenggara, and Gorontalo.

- $7.3 million, five-year South Sulawesi coastal livelihoods and mangrove rehabilitation project, implemented by Oxfam Canada.

- $19 million, seven-year, environmental governance and sustainable livelihoods project focused on Gorontalo and Sulawesi Tenggara, 2008–2015.

- CIDA also contributed $16 million to the green community empowerment (PNPM) program for the 2006–2013 period for three provinces in Sulawesi.

10.1.1.4 Multilateral Funding

World Bank is currently rolling out the third phase of the Coral Reef Management Project (COREMAP-CTI) project. Financed through a $47 million loan, a $10 million grant from Global Environment Facility, and additional commitments from the Government of Indonesia, this five year (2014–2019) project will focus on improving the livelihoods of coastal communities in seven districts, five of which are in Wallacea (South Sulawesi and East Flores), and seven marine protected areas, with four in Wallacea (South Sulawesi, Padaido, and the Banda and Savu Seas). The program will have a small grants facility.

World Bank also supported the Government of Indonesia's innovative green PNPM village development program. This main National Program for Community Empowerment (PNPM) program awards small grants to communities to address local development needs, and Green PNPM added competitive grants to village groups for environmental-related activities, and provided mentoring and technical support for their activities. In Wallacea, it was implemented in South Sulawesi (three districts), West Sulawesi (one district), Southeast Sulawesi (three districts) and North Sulawesi (five districts). The program ended in 2013 and will be incorporated (with other sectoral PNPM schemes) into a "PNPM rural," a five-year program with a total cost of $4.5 billion that will provide grants in 5,300 subdistricts across Indonesia in 2014, including all provinces in Wallacea.

The World Bank is funding AMAN, the Indigenous Peoples Alliance, to implement a project on Improving Governance for Sustainable Indigenous Community Livelihoods in Forested Areas ($3 million, 2012–2015). The project works in nine Indonesian provinces, one of them, Central Sulawesi, is in Wallacea. It also funds projects in the energy, transport, extractive industries and community development sectors, many of them partly or entirely focused on provinces and districts in Wallacea.

Indonesia has an allocation of $87 million for the period 2010–2014 under the **Global Environment Facility** STAR system,[77] the sixth largest of any country. The allocation consists of $54 million for biodiversity, $29 million for climate change, and $4 million for land degradation. However, during this round of GEF funding, there has been relatively limited investment in biodiversity conservation in Wallacea. Two medium-sized programs (less than $1 million) have recently closed. One was focused on the forests of Lambusango in southeast Sulawesi, and the other on the Aketajawe–Lalobata National Park in Halmahera. A full-sized GEF project on Komodo has also recently closed.

A full-size GEF project, Enhancing the Protected Area System for Sulawesi (E-PASS, $6.265 million), is in the process of approval and will support conservation of Lore Lindu and Bogani Nani National Parks, and the Nature Reserves at Tangkoko and Nantu in North Sulawesi.

[77] http://www.thegef.org/gef/STAR/country_allocations. Accessed Dec. 12, 2013.

A $5 million GEF project on strategic planning and action to strengthen climate resilience of rural communities (SPARC) in NTT Province — commenced in 2012, implemented by UNDP. The project aims to integrate climate resilience into development planning coordination, a budgeting program and extension services in NTT.

As noted above, in the marine sector, one Indonesia specific grant to the World Bank Coral Reef Rehabilitation and Management Program — Coral Triangle Initiative (Coremap — CTI III, $8 million, 2014–2019) is under way. GEF has also provided considerable support to the CTI through regional programs.

The GEF small grants program has operated in Indonesia since 1997, managed by the Jakarta-based NGO Yayasan Bina Usaha Lingkungan (YBUL). As of mid-2012, the program had disbursed $6.6 million to 356 grantees since its inception. Recent grants in the Wallacea region include:

- Semau (2013) — baseline assessment of marine resources, $25,000.
- Lembata (2013) — food security and home gardens, $35,000.
- Wakatobi — coastal rehabilitation (2013), and climate change adaptation (2012).
- Lompobattang — planning agricultural interventions, $2,500 (2013) and $34,000 (to 2015).
- South Tanimbar (2013), village-level natural resource management planning, $3,500.
- Sumba, Manupeu Tanadaru (2012–2013), productive land management, $20,000.
- Ambon (2012–2013) — traditional fruits, $3,600.

The **Asian Development Bank** provides loans and technical assistance to the GOI in support of infrastructure, education, health and economic development. It has made only three loans in the NR sector in Wallacea in the last 10 years, for aquaculture, participatory irrigation, and farmer income improvement, totaling $150 million. However, ADB was a funder of the previous phase of the Coral Reef Rehabilitation and Management (COREMAP) project. The largest current loan for rural community infrastructure development is channeled through the PNPM Mandiri community action funding mechanism.

UNREDD had a program in Central Sulawesi from 2010–2012, funded by a $2.95 million commitment from Norway. The program formed a provincial Reducing Emissions from Deforestation and Forest Degradation (REDD) working group and carried out a series of studies and supported planning for the implementation of REDD/low carbon development.

10.1.1.5 Foundations and Funds

The John D. and Catherine T. MacArthur, David and Lucille Packard, Margret A. Cargill and Walton Family foundations have coordinated their grant-making for marine conservation in the Sunda-Banda Seascapes.

The **Margaret A. Cargill Foundation** is providing $9 million in grants over three years, 2012–2014, for the creation of local marine-protected areas, fisheries management and capacity building. Funding of $3 million is provided for the World Wide Fund for Nature's (WWF) work on marine-protected areas in East Flores and Alor-Solor, while a series of smaller grants to The Nature Conservancy, Conservation International, the Coral Triangle Centre, and the Wildlife Conservation Society support other activities in the Sunda-Banda seascape. A second phase of grant-making with a similar timeframe and funding scale is expected to start in 2015 (J. Cole pers. comm. 2014).

The **David and Lucille Packard Foundation** has funded marine conservation through its Western Pacific Subprogram since 1999. The revised strategy for the subprogram (2014–2020, launched in 2013) focuses on reducing the impact of overfishing, through marine-protected areas, governance of near-shore fisheries, and capacity building. Target areas in Indonesia are the Birds Head Seascape of Papua and the Sunda-Banda Seascape of Wallacea. Each year, $5 million to $6 million will be provided, but country-specific country allocations are not yet known.

The John D. and Catherine T. MacArthur Foundation funds coastal marine conservation as one the five priorities under its Conservation and Sustainable Development Program, and will commence a three-year, 2 million US$ round of grant-making in the Sunda-Banda and Bird's Head (Papua) Seascapes, Indonesia, in 2014 (C Holtz pers. comm. 2014). Specific project locations are therefore not yet known.

The **Walton Family Foundation** is part of the consortium of grant-making foundations that supports marine conservation in eastern Indonesia, but focuses on the Bird's Head Seascape, outside the eastern boundary of Wallacea, as one of four global priority regions for its marine conservation grant-making.

The Waitt Foundation is funding the initial five years (2014–2019) of a long-term global "Fish Forever" initiative, implemented by RARE (a U.S.-based Environmental Defense Fund) and University of CaliforniaSanta Barbara. Indonesia is one of RARE's focal countries, with pride awareness-training programs running in Indonesian. RARE has campaign managers in four locations in Sulawesi Tenggara and two in Lombok. Past campaigns have been in North Sulawesi and NTT.

10.1.1.6 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 and similar programs. Laws and regulations require state-owned companies, companies that impact on natural resources, and the mining and gas industry specifically, to plan, implement and report on social and environmental programs. In Wallacea there are large CSR programs by Bank Negara Indonesia and Bank Rakyat Indonesia focused on supporting community-level business development, and CSR programs funded by major extractive industries around their operating locations. Another example is Cargill, which has trained 1,000 farmers to reach independent sustainable certification for either UTZ or

Rainforest Alliance certification. There are also examples of community development activities funded by local companies, such as PT Karamba in Warloka Village, Komodo Subdistrict, East Nusa Tenggara, which has developed community grouper fish production.

10.1.2 Investment by Sector/Theme

10.1.2.1 Overview

Information on 25 current funding programs was gathered to support a simple gap-analysis of funding in Indonesian Wallacea (Table 10.2). The 25 programs address issues relevant to CEPF (rural community empowerment, sustainable natural resource management, protected areas, natural resource governance). All are large, multiyear programs with total values of more than $1 million and, in some cases, tens of millions of dollars. However, because several of the programs are multicountry or multiregion, and the information available made it impossible to estimate the amount allocated to Wallacea, the value of the program is not considered in this analysis. Small grants programs (e.g., GEF small grants, Samdhana Institute, Kehati) were excluded from this analysis.

The 25 programs are funded by 17 donor organizations, of which eight are bilateral donors (13 programs), two are multilateral (five programs), five are foundations (five programs), and two are business (two programs) (Table 10.2).

Table 10.2, Donor-Funded Programs in Wallacea Analyzed for the Gap Analysis

Funding Organization	Type of Funder	Project Name or Implementer	Ecosystem	Theme*
Margaret A Cargill Foundation	Foundation		Marine	SNRM
USAID	Bilateral	IMACS	Marine	SNRM
USAID	Bilateral	MPAG	Marine	SNRM
Waitt Foundation	Foundation		Marine	SNRM
David and Lucille Packard Foundation	Foundation		Marine	SNRM
Macarthur Foundation	Foundation		Marine	SNRM
Walton Family Foundation	Foundation		Marine	SNRM
World bank	Multilateral	COREMAP III	Marine	Ctty dev
GEF	Multilateral	Coremap — CTI	Marine	SNRM
CIDA	Bilateral	Oxfam Canada	Marine	SNRM
World Bank	Multilateral	PNPM	Mixed	Ctty dev
CIDA	Bilateral	Green PNPM	Mixed	Ctty dev
CIDA	Bilateral		Mixed	SNRM
Bank Negara Indonesia (BNI)	Private sector	WWF	Terrestrial	SNRM
EU	Bilateral	various	Terrestrial	Ctty dev
JICA	Bilateral	various	Terrestrial	SNRM
KFW	Bilateral	Forclime 3	Terrestrial	SNRM

Funding Organization	Type of Funder	Project Name or Implementer	Ecosystem	Theme*
AusAID	Bilateral		Terrestrial	Ctty dev
MCC	Bilateral		Terrestrial	SNRM
GEF	Multilateral	EPASS	Terrestrial	PA
GEF	Multilateral	SPARC	Terrestrial	Ctty dev
KFW	Bilateral	Burung Indonesia	Terrestrial	SNRM
KOICA	Bilateral		Terrestrial	SNRM
CIDA	Bilateral	ICRAF	Terrestrial	SNRM
British American Tobacco	Private sector	FFI	Terrestrial	SNRM
*SNRM: sustainable Natural Resource Management; PA: Protected Area Management; Ctty Dev: Community Development				

The programs cover both marine and terrestrial ecosystems, with 10 focused on activities in marine and coastal (e.g., mangrove) environments, 12 on terrestrial and freshwater environments, and three having no specific focus.

Thematically, however, the terrestrial programs show a strong emphasis on sustainable natural resource management (nine programs) and community livelihoods (six programs) and little attention to biodiversity conservation and protected areas (one program). The marine programs appear to integrate these aspects, providing support to creation and extension of large national marine PAs as well as local ones, at the same time as supporting sustainable marine natural resource management.

Geographically, the terrestrial programs are concentrated in the Sulawesi mainland and Nusa Tenggara. In Sulawesi, they are in the north, south and southeast but absent from central areas (e.g., around the biologically important freshwater KBAs in Central Sulawesi) and the eastern arm of the island. A number of programs are in West and East Nusa Tenggara, while Maluku has only one program, in Seram, and the province of North Maluku has none. Marine programs are concentrated in the Banda and Lesser Sunda seascapes, specifically southern Sulawesi, the Lesser Sundas and the Banda Seascape.

Table 10.3. Summary of Geographic and Thematic Coverage of 25 Conservation-Relevant Funding Programs in Wallacea

Subregion	Province	Terrestrial	Marine	Mixed	Total Programs
Sulawesi	North Sulawesi/Gorontalo	2	0	3	**5**
	Central Sulawesi	3	0	0	**3**
	West Sulawesi	0	0	1	**1**
	South Sulawesi	2	2	2	**6**
	Southeast Sulawesi	1	3	3	**7**
Nusa Tenggara	Nusa Tenggara Barat	4	2	0	**6**
	Nusa Tenggara Timor	3	2	0	**5**
	Sunda Seascape	n/a	5	n/a	**5**
Maluku	Maluku	1	0	0	**1**
	North Maluku	0	0	0	**0**

Subregion	Province	Terrestrial	Marine	Mixed	Total Programs
	Banda Seascape	n/a	8	n/a	**8**

10.1.2.2 Recipients of Funding: Indonesia

The major grant programs described in the section above are implemented by international NGOs, multinational organizations, or international consultancy companies. All these implementing agencies work with a range of community groups and local NGO partners on the ground. As noted in the bilateral and multilateral donor sections above, small-grant facilities that can be accessed directly by CSOs in Wallacea are available from JICA (for community development and livelihoods), AusAID, the Multistakeholder Forest Program (for activities related to legality of forest management), and the GEF small-grants program, The USAID IMACS marine program has a small-grants program that is winding down, and it is reported that the COREMAP III-CTI project will also have a small-grants facility.

10.1.2.3 Strategic Funding Initiatives

Indonesia has a number of ongoing debt-swap mechanisms that are funding activities in the environmental sector (TFCA from the U.S.German debt-swap mechanism). None of them impacts on Wallacea.

10.1.3 Gap Analysis: Indonesia

The discussion above demonstrates that **Donor Funding for Conservation and Protected Area Management** in Wallacea is currently very limited, although the two projects planned in Sulawesi will contribute to this area. A similar conclusion was reached in a study on the state of protected area funding in Indonesia (State Ministry of Environment 2006), which found that international support for protected area management was decreasing, particularly with respect to funding channeled through the national budget, and that the decline in international assistance was not being compensated for with an increase in funding from other sources. The study estimated that in 2006 there was a shortfall of $81.94 million between available funding ($53.37 million) and optimal funding for the entire Indonesia PA system ($135.31 million).

In terms of **geographic focus**, the analysis of 25 programs, above, suggests that:

- Virtually all marine program funding is concentrated through a coordinating approach by several foundations on the Lesser Sundas and Banda seascapes. The World Bank's COREMAP III program will also focus on this area. Several million dollars are therefore going to be available to marine conservation and coastal community livelihoods activities in these two regions for the next few years. **Areas identified as of very high priority for marine conservation but which lack any large-scale program funding** are the islands of North Sulawesi,

Halmahera and surrounding islands in North Maluku, Togean and Banggai islands in Sulawesi.

- Funding for terrestrial programs is concentrated in the northern arm of mainland Sulawesi (North Sulawesi and Gorontalo), the northern part of Central and West Sulawesi, and the two southern "legs" of Sulawesi. There is no funding for terrestrial programs in high-priority areas including the areas of Lake Poso and the Malili Lakes in Central Sulawesi; the islands of North Sulawesi, Halmahera and surrounding islands in North Maluku. In addition, the number of programs in Maluku and East Nusa Tenggara is very limited.

10.2 Timor-Leste

10.2.1 Investment by Source

10.2.1.1 National Government

The UN administration UNTAET designated 11 terrestrial and four marine "wild places" in Timor-Leste. These were adopted by the national government, which combined three of them into the Nino Konis Santana National Park. A protected areas decree, which in February 2014 was at the final stage of discussion by the Council of Ministers, would establish a total of 50 terrestrial protected areas, including the 11 declared by UNTAET (see notes on the process and proposed management in Chapter 4, Section 4.2.2, Protection Status of KBAs). Among the 50 existing and proposed protected areas, only one — Nino Konis Santana National Park — has a marine component. However, further marine areas have been identified and will be proposed as protected areas in a separate decree from the Fisheries Department of the Agriculture Ministry. The total area of currently designated terrestrial protected areas in Timor-Leste is approximately 200,000 hectares, or 15 percent of the land area. The data in the annex on the draft of the protected areas law suggests that the eventual total of 50 terrestrial protected areas may be 500,000 hectares, but this figure is tentative, as the boundaries of the areas will be finalized as part of establishing participatory management of the areas. An additional 120,000 hectares are covered by marine-protected areas. Information on planned funding for the creation and management of these protected areas was not available at the time of writing.

No figures for government funding for protected areas in Timor-Leste were available, but Wildlife Agency staff reported that the agency's budget has been cut each year, and that the current budget is sufficient to cover salaries but allows for only very small operational and management costs. The agency has seven staff at the national park, three in Tilomar in the south-west of the country, and one staff at Citrana in Oecussi. The National Park staff have been able to bring additional resources into the area by facilitating the creation of community groups and assisting them to access funding from other government sources, including the Agriculture Department. Through this mechanism, they have implemented small-scale agricultural programs, including preparing land and providing seeds and sandalwood seedlings.

10.2.1.2 Local Government

Local government has not provided funding for protected areas or conservation, with the exception of the funding to groups in the national park noted above; however, Timor-Leste is going through a period of decentralization of funding to the village (*suco*) level, and local governments may become more important in future natural resource decisions.

10.2.1.3 Bilateral Funding

According to OECD–DAC, Timor-Leste received $284 million in foreign aid in 2011, 86 percent of it from bilateral donors. This figure constituted about 9 percent of gross national income. Major donors were Australia, the United States, Portugal, Japan and the European Union, and 75 percent of the aid was focused on education, health and other social sectors. Bilateral donor programs focus on strengthening democratic and governance institutions, economic development, health, education, agriculture and food security. These programs interact with the priorities of CEPF in that environmental sustainability, water, fisheries and forests are seen as an important basis for sustainable rural development.

All the programs of the EU in Timor-Leste have focused on the areas outlined above. The EU has funded a series of rural livelihoods and food security programs, all of them focused on community based natural resource management:

- $0.7 million, 2010–2014, implemented by Centro Informação e Documentação Amilcar Cabral (CIDAC).
- $1.5 million, 2009–2013, implemented by World Vision, focused on Baucau District.
- $1.4 million, 2009–2013, implemented by Mercy Corps.
- $1.7 million, 2010–2013, implemented by CARE International UK.
- $1.5 million, 2007–2011, implemented by Austrian Red Cross, focused on water and sanitation.
- $1.8 million, 2010–2012, implemented by HIVOS Netherlands.

In addition, the European Union has funded three phases of a rural development program for Timor-Leste (Phase II, 2006–2011, $11.6 million, implemented by GIZ; phase III, $13.7 million).

AFD: French development aid in the region is managed from the AFD office in Jakarta. The French embassy has supported cultural and capacity building activities in Timor-Leste, but it does not have ongoing program of development or conservation in the country.

Government of Japan: Japan provided $18 million in grants and $8 million in technical assistance to Timor-Leste in 2011. The main program in the natural resources field is the community-based sustainable resource management project (2010–2015). The project works in the capital, Dili, and in the Laclo and Comoro river basins, promoted local-level

land-use planning, capacity building, and watershed rehabilitation. Other projects have focused on the development of agricultural commodities, infrastructure and development.

USAID's Coral Triangle Initiative Support Program ($42 million for six countries, 2008–2013) has funded community-based marine conservation activities at several sites in the north coast of Timor-Leste, implemented by Conservation International. USAID has also funded the National Oceanographic and Atmospheric Administration to undertake surveys, identify marine conservation priorities, and build capacity among Timorese conservationists. Other programs in the country focus on governance and government institutions, health, and economic growth. USAID partners with NZ AID, with Conoco-Philips on its agricultural programs, and with AusAID on its health programs. Further funds are passed through the Millennium Challenge Corp. to support immunization programs.

AusAID's support to Timor-Leste is guided by a Strategic Planning Agreement for Development, signed in 2011, which prioritizes sustainable economic growth and food security, education, health and water, and the provision of government services. AusAID is Timor-Leste's largest bilateral aid donor, providing $119 million in 2012–2013, almost half of all aid to the country. Aid funding is focused on small farmers and agricultural improvements, water supply, health provision, and education. Support will also be focused on rural roads rehabilitation in the coming years. No specific support is provided for the natural resource or conservation sectors.

AusAID will contribute to a major program of disbursement of development funds to village (suco) authorities, to be rolled out in 2013–2014.

Portugal provided $27 million in aid to Timor-Leste in 2011, down from a maximum of $75 million in 2002.

10.2.1.4 Multilateral Funding

The only multilateral program with direct terrestrial conservation links in Timor-Leste is **UNESCO**, with funding from the **Spanish Bilateral Aid Agency**. It plans to support management planning in the Nino Konis Santana National Park as part of a regional program on the management of biosphere reserves. The Timor-Leste National Commission for UNESCO promotes the model of biosphere reserve, including the Small Islands Developing States (SIDS) platform and Local and Indigenous Knowledge System programs.

The six-country **Coral Triangle Initiative** is served by a secretariat based in Indonesia. In Timor-Leste, it works through a national coordinating committee chaired by the director-general of the Ministry of Agriculture with a national focal point in the Fisheries Department of the Agriculture Ministry. The five global outputs of CTI are consolidated into three in Timor-Leste, each coordinated by a working group: Seascapes and fisheries is led by the Fisheries Department, marine and species conservation by the National

Parks and Wildlife Department, and climate change outputs is led by the Environment Department of the Ministry of Commerce, Industry and Environment.

The **Asian Development Bank** funded the **Coral Triangle Pacific Program** (formally, "Strengthening Coastal and Marine Resources Management in the Coral Triangle of the Pacific, Phase III"), a four-year, $18.5 million program running until December 2014 that focuses on three coral triangle countries — Papua New Guinea, Timor-Leste and the Solomon Islands, as well as Fiji and Vanuatu. It aims to promote increased capacity and practical application of sustainable coastal fisheries management. In Timor-Leste the program is implemented through the National Directorate of Fisheries and Aquaculture, Ministry of Agriculture and Fisheries, and "will introduce integrated coastal resources management and ecosystem-based coastal fisheries management around the islands of Atauro Island (a marine KBA) and Batugede."[78]

The **World Bank** program in Timor-Leste focuses on road infrastructure, education and health sectors. No programs are of direct relevance to the goals of the Critical Ecosystem Partnership Fund, but in the context of rural roads development the World Bank is supporting participatory land-use planning and sustainable management along priority road corridors.

The United Nations Development supported the formulation and implementation of the National Biodivesity Strategy and Action Plan (see GEF below) and the National Strategic Plan, and manages the Global Environmen Facility's small-grants fund in Timor-Leste.

Global Environment Facility: Timor-Leste's indicative allowance under the GEF-5 replenishment (2010–2014) is $4.4 million: $1.5 million for biodiversity, $2 million for climate change, and $0.9 million for land degradation. Five projects have been funded in this round: three on climate change (focused on bioenergy and adaptation of rural infrastructure), one on biodiversity ($277,200, development of the national biodiversity strategy and action plan, reports to the Convention on Biological Diversity, and establishment of a national clearing house mechanism) and one multifocal (national capacity self-assessment). In addition, Timor-Leste was part of 12 regional or global projects. Of these, seven were marine focused — through the Coral Triangle Initiative or otherwise, and the remaining five were concerned with NBSAP revision and pan-Pacific networking.

10.2.1.5 Foundations and Funds

The U.S. foundations coordinating their funding of marine conservation in the Banda and Lesser Sundas seascapes are, as of early 2014, not funding activities in Timor-Leste.

[78] http://www.ctknetwork.org/programs-projects/adb-coral-triangle-pacific-program/ and http://www.ctknetwork.org/wp-content/themes/Matrix/pdf/CTI-Pacific-Program-Brief.pdf. Accessed Feb. 21, 2014.

10.2.1.6 Private Sector

At present, the only big industry involvement in Timor-Leste is the development of the oil and gas fields in the Timor Trench, between Timor-Leste and Australia. One field, Bayu-Undan, is operated by Conoco-Philips. Significant untapped oil reserves exist in the Greater Sunrise field, which is being developed by Conoco-Philips, Shell, Osaka Gas and Woodside Energy Ltd. However, the project itself is highly contentious and future development of the processing facilities in Timor-Leste is uncertain. The potential for constructive CSR engagement seems limited at present, but Conoco-Philips is reported to be looking for opportunities to make small grants (R. Pinto pers. comm. 2014).

10.2.2 Gap Analysis: Timor-Leste

A described above, donor funding in Timor-Leste is focused on the critical human welfare needs in the country. The limited biodiversity conservation funding that is available has been focussed on marine resource management, with a small amount of funding provided for the management planning of the Nino Konis Santana National Park through UNESCO.

Government funding for conservation is very limited. Timor-Leste is in the process of creating a network of protected areas that covers the most important remaining natural habitats and biodiversity in the region; however, the institutions and resources to manage these have not yet been put in place. The National Gap Analysis on which this network is based identifies the development of management plans and finalization of the legal status of these areas as the highest priority for government action.

10.3 Link to the CEPF Monitoring Framework and Long-Term Goals

Data on funding for conservation in Wallacea in this chapter is relevant to Goal 3 of the long-term goals, and specifically the following criteria:

Criteria 1 (public sector funding): Table 10.1 gives a breakdown of the funding from the Indonesian Ministry of Forestry to National Parks and Natural Resource Conservation Agencies in Wallacea. The section on Special Funds for the Environment and Forestry records other central government disbursements for activities by local governments. In short, perhaps $35 million or more are available each year for conservation management and associated activities. In Timor-Leste, figures for funding are not available, but they are reported to be sufficient only for salaries of the limited national park staff. No other protected area gets any budget allocation.

Criteria 2 (civil society funding): Assessing whether nongovernment organizations have secure funding for five years or beyond is somewhat subjective, but in the marine sector the current investment from the consortium of U.S. Foundations for Lesser Sundas and Banda (see section above on Foundations and Funds) appears to guarantee significant

funding for the next few years. In contrast, there is virtually no large scale funding for terrestrial activities, the most significant being the **Kreditanstalt für Wiederaufbau** grant to Burung Indonesia for a restoration concession in Gorontalo, Sulawesi. Terrestrial programs such as those of Wetlands International in Flores, Burung in Sumba and Flores, and the local NGOs ALTO and YANI are funded by combining small grants from several sources.

No dedicated conservation funding is available for Timor-Leste. The only international NGO, CI, has limited funding for marine and terrestrial activities, as does the main national environmental NGO, Haburas.

Criteria 3 (donor funding): This indicator refers to the same information on funding sources as criteria 2. In the marine sector, the Banda Sea and Lesser Sundas have significant funding, but Halmahera, Togean-Banggai and North Sulawesi have little or none. In the terrestrial sector, funding at a site-specific level is or will be available for a number of KBAs in North and Central Sulawesi through the planned GEF-EPAS program, and KfW-GoI Forclime III program. The only conservation funding for Timor-Leste is support from UNESCO for management planning in the national park.

Data on the management status of KBAs is relevant to the **Indicator 4** of the CEPF monitoring framework (change in the number of hectares with strengthened protection and management). Table 10.1 and the paragraph below it show that 11 terrestrial and four marine national parks in Indonesia have dedicated budgets and staff. All these parks also have management plans and are legally established, although an unknown number have completed the formal process of gazetting and demarcating their boundaries. A further 87 nature reserves, wildlife reserves, hunting reserves, forest parks and nature tourism parks covering 1,274,881 hectares have no dedicated budget or management unit, but are managed by the regional Natural Resources Conservation Agency. While gross budget per hectare and hectares per staff are similar, national park resources are dedicated to the management of the park, while those for KSDA units are used for many other tasks. Overall, their management effectiveness of non-national park protected areas is expected to be significantly less. Outside of the protected areas system, there are local budgets for forest protection and rehabilitation, but no effective management. This may change as the Forest Management Unit (Kesatuan Pengelolaan Hutan, KPH) system is rolled out; at present, it is represented in each province by one or two pilot KPHs, and effective management on the ground has not started. Table 10.4 summarizes the changes that can be used as indicators for the management effectiveness of KBAs:

Table 10.4. Baseline for Strengthened Protection and Management of KBAs (CEPF Monitoring Framework Indicator 4)

Type of Protected Areas	Baseline Management Status (November 2013)	Hectares Covered by This Status (November 2013)
National park	Average investment of $9.16 per year and 3,242 hectares per staff across all terrestrial NPs in Indonesian Wallacea	1.14 million (11 NPs) Note: boundary demarcation and gazettement could be a further management quality indicator if data is available

Type of Protected Areas	Baseline Management Status (November 2013)	Hectares Covered by This Status (November 2013)
Non-national park protected area	Average investment of US$ 10 per year (entire non-NP budget) and 3,213 hectares per staff member across all terrestrial non-NP protected areas in Wallacea	1.27 million hectares (87 protected areas)
KBAs outside the protected areas network covered by Forest Management Unit (KPH)	KPHs have been created but have not received budget and are not effective on the ground	Total area of KBA within pilot KPHs not yet known
KBA outside the above categories	Management status will be determined by license holder and activities of local stakeholders — probably management effectiveness can only be baselined and compared on site-by-site basis	Remainder of Terrestrial KBA area not covered by categories above

Indicators 14, 15, 16 and 17 in the CEPF monitoring framework address the availability of sustainable financing for conservation in Wallacea. At present, no dedicated funding mechanism exists, and so the baseline for these indicators is zero. A small-grants fund for community development, the Sulawesi Community Foundation and the Lesser Sundas Maluku Community Foundation provide small grants to civil society in the region, but these are themselves dependent on donor funding and so are not sustainable. Kehati's funding for biodiversity conservation is sustained by the organization's investment fund, but this is not exclusively for Wallacea. No sustained funding mechanisms are known for Timor-Leste.

11. CEPF INVESTMENT NICHE

CEPF is designed to facilitate rapid and flexible funding to civil society to act in areas where globally significant biodiversity is under the greatest threat. Funds should add incremental value to existing initiatives, and should aim to ensure that the outcomes realized through investments are sustained. These criteria provide the basic framework for identifying the niche for CEPF.

The average annual investment for conservation in Wallacea is roughly $60 million. This may seem like a significant amount for a small area, but it is best understood as unevenly distributed. Half of the funding is Government of Indonesia internal revenue directed at its national protected area system, while, for example, the amount of funding for conservation in Timor-Leste is practically zero. There is no near-term anticipation of funding being more broadly distributed toward geographic or thematic need. Consequently, there is a large and growing shortfall between the baseline level of conservation investment, and the level required to address threats facing all globally significant biodiversity (i.e. species, site and corridor outcomes) in the hotspot. With the level of resources typically available, the incremental investment by CEPF will only be partly able to meet this shortfall. Thus, there is a need to allocate this investment wisely, toward the highest priorities for civil society-led conservation action.

The purpose of the investment niche is to define where CEPF investment can make the greatest and most sustained contribution to the conservation of globally important biodiversity within the Wallacea Hotspot, within the context of other investments made by government, donors and civil society. To this end, the CEPF niche avoids duplicating other investments, while realizing opportunities for synergy, where possible. The niche is informed by the conservation outcomes defined in Chapter 4, the capacities and needs of civil society organizations reviewed in Chapter 7, the threats to biodiversity assessed in Chapter 9, the patterns and trends in conservation investment by other actors set out in Chapter 10, and the other thematic analyses presented in the profile. The precise scope of the niche was established during the stakeholder consultation workshops, at which draft results from desk studies were presented and verified, and participants were invited to propose priorities for CEPF investment.

The CEPF investment niche is defined in three dimensions. Taxonomic priorities for investment are defined as a set of "priority species," by selecting priorities from among the list of species outcomes. Geographic priorities for investment are defined as a set of "priority sites" by selecting priorities from among the list of site outcomes. Thematic priorities for investment are defined as a set of investment priorities grouped under broad strategic directions by identifying fields of work that: contribute to the conservation of priority species and sites; fill gaps in existing conservation investment; address high priority threats; focus where civil society can make the most effective contribution to conservation; and, where appropriate, deliver human well-being benefits.

The ecosystem profile presents a common vision for action, formulated through an inclusive, participatory process that engaged more than 350 representatives of civil society, donor, and government organizations in the Wallacea Hotspot. The profile articulates an investment strategy that focuses on those taxonomic, geographic and thematic priorities where additional resources can be used most effectively in support of civil society initiatives that complement and better target investments by national governments and other donors. At the same time, the profile focuses attention on activities that can contribute to protection of the rights and assets of the rural poor while addressing biodiversity conservation. The basic premise underlying the investment niche is that conservation investment should be targeted where it can have the maximum impact on the highest conservation priorities, while providing opportunities to strengthen and engage civil society, and support the livelihoods of poor communities. In this way, the investment niche complements funding provided by other organizations while playing to CEPF's unique strengths and contributing to the fund's global objectives.

Three key characteristics underpin the CEPF niche. First, this is a region undergoing rapid economic growth. Whether speaking about the entire country of Timor-Leste or the several Indonesian provinces that comprise the hotspot, the national governments and the people of the region consider such change to be unequivocally positive. Wallacea, referred to locally as Eastern Indonesia or Nusa Tenggara—literally, the "islands in between" —was long forgotten during the surges of growth from the 1970s through the early 2000s. Not having the population or urban muscle of Java, Bali, or parts of Sumatra, and not having the vast natural resources of Sumatra, Kalimantan, or Papua, while instead suffering as a place of little rainfall and little political attention, the region made a turn in the last 10 years. The Government of Indonesia, in particular, sees the need for positive economic growth across the archipelago, if only as a hedge against the cycles of boom and bust in the more resource-rich parts of the country. To be relevant, CEPF must make grants that, while promoting biodiversity conservation, support the growth agendas of the two countries.

Second, there is a limited cadre of civil society organizations engaged purely in conservation work in the region, as opposed to groups organized around community development, health, education, livelihoods, credit, or religious goals. Nevertheless, during stakeholder consultations, participants clearly stated that conservation actions need to be understood, owned and implemented by local communities themselves if they are to be sustained and effective. However, these conditions are not always met by communities in the hotspot, and they may not have the necessary capacity to implement conservation grants as typically conceived or the legal status to receive CEPF funding directly. International and national NGOs and universities may be able to play an intermediate role, and CEPF will foster partnerships that draw on the relative strengths of civil society at different levels.

Third, there is a clear distinction in key biodiversity areas where customary institutions and management practices prevail versus areas where social change has led to the decline of those institutions. Where customary practices still prevail, they may form an effective basis for conservation action, but they often need to be bolstered with formal legal

regulation to anticipate external pressure and future social change. Areas threatened by large-scale or legally licensed operations may be best protected through private sector engagement or legal protection. However, in areas where customary resource management is still effective, creation of formal protected areas may actually undermine the authority of local leaders, and fail to deliver conservation goals.

With these considerations in mind, **the CEPF niche is to support a diversity of civil society organizations with varying levels of capacity to achieve conservation outcomes and environmental sustainability within the increasingly important national agendas of economic growth.** CEPF recognizes that local communities and their organizations are the ultimate custodians of the biodiversity of the Wallacea Hotspot, but that levels of capacity vary widely across the region. Thus, an explicit focus on capacity building for local and national civil society, through partnerships, networks and mentoring, is central to the sustainability strategy of the CEPF investment program in the Wallacea Hotspot. With support from national and international NGOs, universities and private companies, an enabling regulatory and institutional context established by national, provincial and local government, and a significant focus on increasing capacity, local civil society will be able to have significant impact. The complementary capacities of different sections of civil society will be leveraged in support of local communities by catalyzing partnerships. Through these partnerships, communities and civil society organizations at different levels will jointly explore the conservation status of priority species and sites, develop a common understanding of the values of and threats facing them, drawing on traditional ecological knowledge as well as peer-reviewed science, and develop and implement conservation actions that are led by and relevant to local communities. To respond to threats originating outside of the community, such as mining or illegal fishing, civil society will be supported to integrate biodiversity conservation into local land-use and development planning. Drawing on lessons learned from past conservation programs, conservation interventions for priority species and sites will be developed at paces appropriate to each part of Wallacea, to allow sufficient time for trust and understanding to be built among partners, for capacity and knowledge to be transferred, and for long-term funding to be identified and secured.

12. CEPF INVESTMENT STRATEGY AND PROGRAM FOCUS

12.1 Species Priorities — Indonesia

Of 560 globally threatened species in Wallacea, 229 are considered to be the subject of direct collection or killing for consumption and trade; however, this exploitation is thought to be a serious threat only to a subset of these species. CEPF grant-making will prioritize those globally threatened species that require specific action, beyond site protection, to ensure their conservation. These outcomes are listed in Tables 12.1 and 12.2.

Table 12.1. Globally Threatened Terrestrial Species in Wallacea Prioritized for Species Focused Conservation Action

Species Name	Species group	IUCN status	CITES appendix	Protection status in Indonesia	Trapping for trade	Trapping for consumption	Pet/Hobbyist collection	Proposed Conservation Actions
Babyrousa togeanensis	Mammals	EN	App I	Y	Y	Y	N	Awareness and education at local level
Cacatua alba	Bird	VU	App II	N	Y	N	Y	Policy advocacy for legal protection; awareness at local level
Cacatua moluccensis	Bird	VU	App I	Y	Y	N	Y	Law enforcement against smuggling; population and monitoring surveys
Cacatua sulphurea	Bird	CR	App I	Y	Y	N	Y	Law enforcement against smuggling; population and monitoring surveys
Chelodina mccordi	Reptiles	CR	App II	N	N	Y	Y	Advocacy for legal protection; local awareness; enforcement of protection; population survey
Cuora amboinensis	Reptiles	VU	App II	N	Y	N	Y	Advocacy for legal protection
Eos histrio	Bird	EN	App I	Y	Y	N	Y	Law enforcement against trapping and trade, monitoring of trade
Eulipoa wallacei	Bird	VU	none	Y	N	Y	N	Management of nesting grounds to ensure sustainable exploitation; population and habitat monitoring;
Indotestudo forstenii	Reptiles	EN	App II	N	Y	N	Y	Advocacy for legal protection; awareness at local level
Leucocephalon yuwonoi	Reptiles	CR	App II	N	Y	N	Y	Advocacy for legal protection; awareness at local level
Lorius garrulus	Bird	VU	App II	N	Y	N	Y	Advocacy for legal protection; investigation and enforcement
Macaca nigra	Mammals	CR	App II	Y	N	Y	N	Law enforcement; awareness and education at local level
Macrocephalus maleo	Bird	EN	App I	Y	N	Y	N	Protection of nesting grounds from egg collecting; population and habitat monitoring

Species Name	Species group	IUCN status	CITES appendix	Protection status in Indonesia	Trapping for trade	Trapping for consumption	Pet/Hobbyist collection	Proposed Conservation Actions
Nepenthes danseri	Plant	VU	App II	Y	Y	N	Y	Investigation and action against collecting and trading
Nepenthes eymae	Plant	VU	App II	Y	Y	N	Y	Investigation and action against collecting and trading
Nepenthes glabrata	Plant	VU	App II	Y	Y	N	Y	Investigation and action against collecting and trading
Nepenthes hamata	Plant	VU	App II	Y	Y	N	Y	Investigation and action against collecting and trading
Nepenthes tomoriana	Plant	VU	App II	Y	Y	N	Y	Investigation and action against collecting and trading
Ornithoptera aesacus	Lepidoptera		App II	N	Y	N	Y	Investigation and action against collecting and trading
Ornithoptera croesus	Lepidoptera	EN	App II	N	Y	N	Y	Investigation and action against collecting and trading
Troides dohertyi	Lepidoptera	VU	App II	N	Y	N	Y	Investigation and action against collecting and trading
Troides prattorum	Lepidoptera	VU	App II	N	Y	N	Y	Investigation and action against collecting and trading

Table 12.2. Globally Threatened Marine Species in Wallacea Prioritized for Species Focused on Conservation Action

Species Name	Species group	IUCN status	CITES appendix	Protection status in Indonesia	Trapping for trade	Trapping for consumption	Pet/Hobbyist collection	Proposed Conservation Actions
Eretmochelys imbricate	Reptiles	CR	App I	Y	Y	Y	Y	Action against hunting of adults, egg collection and trade
Pristis pristis	Marine fish	CR	App II	Y	Y	Y	Y	Evaluation of impact of by-catch and possible conservation actions
Pristis zijsron	Marine fish	CR	App I	Y	Y	Y	Y	Evaluation of impact of by-catch and possible conservation actions
Anoxypristis cuspidate	Marine fish	EN	App I	Y	N	Y	N	Evaluation of impact of by-catch and possible conservation actions

Species Name	Species group	IUCN status	CITES appendix	Protection status in Indonesia	Trapping for trade	Trapping for consumption	Pet/Hobbyist collection	Proposed Conservation Actions
Balaenoptera musculus	Marine mammals	EN	App I	Y	N	Y	N	Investigation of extent and severity of threat from local hunting, and threat from disturbance by submarine mineral exploration and exploitation, and shipping
Balaenoptera physalus	Marine mammals	EN	App I	Y	N	Y	N	Investigation of extent and severity of threat from local hunting, and threat from disturbance by submarine mineral exploration and exploitation, and shipping
Caretta caretta	Reptiles	EN	App I	Y	N	Y	Y	Action against hunting of adults, egg collection and trade
Cheilinus undulatus	Marine fish	EN	App II	N	Y	Y	Y	Improve monitoring, enforcement and quota setting
Chelonia mydas	Reptiles	EN	App I	Y	Y	Y	Y	Action against hunting of adults, egg collection and trade
Pristis clavata	Marine fish	EN	App I	Y	Y	Y	Y	Evaluation of impact of by-catch and possible conservation actions
Carcharhinus longimanus	Marine fish	VU	App II	N	Y	Y	N	Evaluation of impact of finning, by-catch and possible conservation actions
Dermochelys coriacea	Reptiles	VU	App I	Y	Y	Y	Y	Action against hunting of adults, egg collection and trade
Dugong dugon	Marine mammals	VU	App I	Y	N	N	N	Review of legal protection and awareness to reduce hunting, by-catch and boat collisions
Lepidochelys olivacea	Reptiles	VU	App I	Y	Y	Y	Y	Action against hunting of adults, egg collection and trade
Manta alfredi	Marine fish	VU	App II	Y	Y	Y	N	Awareness and enforcement of new regulation protecting Manta spp in IND
Manta birostris	Marine fish	VU	App II	Y	Y	Y	N	Awareness and enforcement of new regulation protecting Manta spp in IND
Bolbometopon muricatum	Marine Fish	VU	None	N	Y	Y	N	Improve monitoring, enforcement and quota setting
Physeter macrocephalus	Marine mammals	VU	App I	Y	Y	Y	N	Investigation of extent and severity of threat from local hunting, and threat from disturbance by submarine mineral exploration and exploitation, and shipping
Rhincodon typus	Marine fish	VU	App II	N	Y	Y	N	Strengthening regulations and increase awareness to reduce local hunting, disturbance from boat collisions and tourism
Tridacna derasa	Marine moluscs	VU	App II	Y	Y	Y	Y	Investigation of collection and trade, regulation and awareness if appropriate

Species Name	Species group	IUCN status	CITES appendix	Protection status in Indonesia	Trapping for trade	Trapping for consumption	Pet/Hobbyist collection	Proposed Conservation Actions
Tridacna gigas	Marine moluscs	VU	App II	Y	Y	Y	Y	Investigation of collection and trade, regulation and awareness if appropriate
Coral spp (176 spp)	Coral	EN (9) VU (167)	App II	N	Y	N	Y	Improved monitoring of harvesting based on CITES export quotas, especially for EN species. Input to quota setting and monitoring of domestic trade
Holothuria spp, Actonipyga spp, Stichopus herrmanii, Thelenota ananas	Sea cucumber 10 Spp	EN (5) VU (5)	none	Y	Y	Y	N	Monitoring of collection and export trade, awareness and enforcement

12.2 Terrestrial Site Priorities — Indonesia

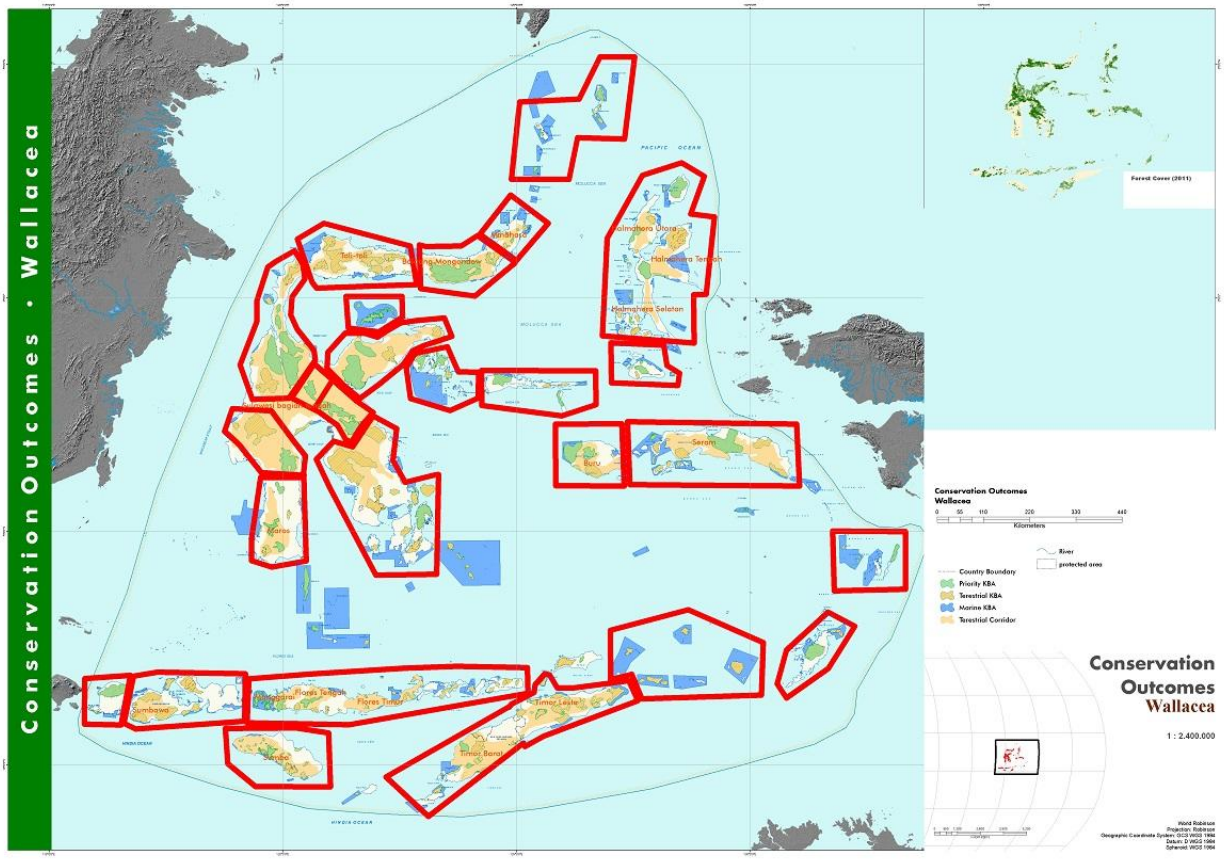
Chapter 4 (Conservation Outcomes) described 251 terrestrial KBAs, 23 of them in Timor-Leste. The two approaches to prioritizing KBAs presented in Chapter 4 — ranking them based on vulnerability and irreplaceability, and identification of a minimum critical set of sites that would need to be conserved to ensure that each globally threatened species is represented in at least one KBA — both result in a list of priority KBAs that are widely spread across Wallacea.

This presents a challenge. Making grants for conservation action at KBAs across the region risks spreading limited resources too thinly and reducing the chance of a significant impact at any sites. Experience from other grant-making schemes has shown the advantages of having grants clustered in focal areas, rather than scattered widely. Doing so reduces the transaction costs of administering the grants program and makes it possible to provide support and capacity building to grantees efficiently. It also creates opportunities for collaboration between grantees and for sharing knowledge and learning.

Concentrating all CEPF grant-making in one area would mean that the program could address only the conservation of a small fraction of the conservation outcomes identified, because priority species and sites are distributed across Wallacea. It is necessary to compromise, therefore, choosing a set of priority areas that cover a high proportion of

priority species and KBAs, while offering opportunities for efficient grant-making and capacity building. To do this, KBAs were grouped into 26 “clusters,” and then the clusters were prioritized based on the definition of the CEPF niche defined in Chapter 11 — biological importance, threat, local stakeholder commitment, external stakeholder commitment, or funding need (Figure 12.1).

Figure 12.1. Map of Terrestrial KBA Grouped into 26 Bio-geographic Clusters for Prioritization



Each cluster comprises all the terrestrial KBAs in a specific area, with boundaries between clusters defined by island groups or biogeographic fault lines. The 26 clusters covered 245 of the 251 terrestrial KBAs. Six remote island KBAs (Banda, Tana Jampea, Kalatoa, Selayar, Manuk and Gunung Api) do not fall into any cluster. The costs and difficulty of accessing these KBAs and the lack of any known stakeholder commitment on most of them means that, even though they are important for conservation, they are not a priority for CEPF funding and are excluded from further analysis.

The 26 clusters were then prioritized for CEPF funding using criteria detailed in Table 12.3.

Table 12.3. Criteria for the Evaluation of KBA Clusters to Determine Geographic Priorities for CEPF Grant-making

Criteria	Assessment	Scoring
Biodiversity value	Biodiversity value calculated by: • Number of globally threatened species in the cluster found at only one KBA x 2 *plus* • Number of globally threatened species found ONLY in the cluster but at more than one KBA x 1	Low = 0–5 = score 1 Medium = 6–10 = score 2 High = 11–15 = score 3 Very High = 16–20 = score 4 Extreme = >20 = score 5
Threat	• Large scale industrial extraction or conversion activities • Significant commercial mineral reserves • Lowland/flat topography • Close to large population center • Unsustainable exploitation of biodiversity by local population • Conversion of habitat by local population	Low threat = 1 Medium threat = 2 High threat = 3
Local Stakeholder Commitment	• Active CSO programs on conservation • Local community have/want stewardship • Local government policy and actions • Ecosystem services contribute to livelihoods and economy	Low commitment = 1 Medium commitment = 2 High commitment = 3
External stakeholder commitment	• Private sector support to conservation activities • Central Government Support to conservation activities • National/International/Agency conservation program • University research program	Low commitment = 1 Medium commitment = 2 High commitment = 3
Need for funding	• Existing donor funded conservation programs • Planned donor funded conservation programs	Low need for funding = 1 Medium need for funding = 2 High need for funding = 3

Information gathered from local stakeholder workshops, expert consultations and literature was used to evaluate each cluster of KBAs against the criteria above. The final scores ranged from 14 to 7 (Table 12.4).

Table 12.4. Results of Prioritization of KBA Clusters for CEPF Funding (Selected Priority Clusters Shaded)

KBA Cluster Number	KBA Cluster Name	Biodiversity Score	Threat Score	Local Stakeholder Commitment Score	External Stakeholder Commitment Score	Need for Funding	Total Score
1	**Sangihe-Talaud**	**4**	**2**	**3**	**2**	**3**	**4**
2	Minahasa	2	3	2	2	1	10
3	Bolaang	1	2	1	2	1	7
4	Toli-toli	1	2	1	2	1	7

KBA Cluster Number	KBA Cluster Name	Biodiversity Score	Threat Score	Local Stakeholder Commitment Score	External Stakeholder Commitment Score	Need for Funding	Total Score
5	Lindu	2	1	1	2	1	7
6	**Poso**	**4**	**3**	**1**	**1**	**3**	**12**
7	Togean	1	1	1	2	3	8
8	Sulawesi Timur	1	2	1	1	3	8
9	Peleng-banggai	1	1	1	1	3	7
10	**Sulawesi Selatan**	**4**	**2**	**2**	**2**	**3**	**13**
11	Latimojong-Mambuliling	1	2	2	1	3	9
12	**Malili**	**5**	**3**	**1**	**2**	**3**	**14**
13	Sulawesi Tenggara	1	2	2	3	2	10
14	**Halmahera**	**3**	**2**	**2**	**2**	**3**	**12**
15	Obi	1	1	2	1	3	8
16	Sula	1	1	2	1	3	8
17	Buru	1	2	2	1	3	9
18	**Seram**	**3**	**2**	**1**	**1**	**3**	**10**
19	Kai	1	2	1	1	3	8
20	Tanimbar	1	2	1	1	3	8
21	Letti	1	2	1	1	3	8
22	Lombok	1	2	3	3	1	10
23	Sumbawa	1	3	1	1	3	9
24	**Flores**	**3**	**2**	**1**	**2**	**2**	**10**
25	Sumba	2	1	3	2	2	10
26	Timor*	1	2	2	2	2	9

*The Timor cluster includes data from KBAs in Timor-Leste in the biodiversity score because Timor Island forms a single biogeographic unit. However, the score would still be 1 if Indonesian Timor and Timor-Leste are treated as separate clusters.

Overall, a top-five set of KBA clusters emerges with scores of 12 to 14: Sangihe-Talaud, Lake Poso, Malili Lakes, South Sulawesi, and Halmahera. All have biodiversity values of 3 or more, and a high need for funding. An additional six clusters scored 10 overall, but only two of them have a biodiversity score of 3 or more: Seram and Flores. The other four clusters that scored 10 (Minahasa, Sulawesi Tenggara, Lombok, Sumba) were excluded because they have only low or medium scores for endemic and threatened biodiversity, and in two cases because they were judged to have a low need for funding (Minahasa, Lombok). Figure 12.2 illustrates the prioritized clusters, and Table 12.5 lists the KBAs in the clusters selected as priorities for CEPF funding. Note that these sites are

not all of equal importance, and CEPF should consider the biodiversity value, identifying priority KBAs within each cluster when making grant decisions.

Figure 12.2: Eight Clusters of Terrestrial KBAs Prioritized for CEPF Funding

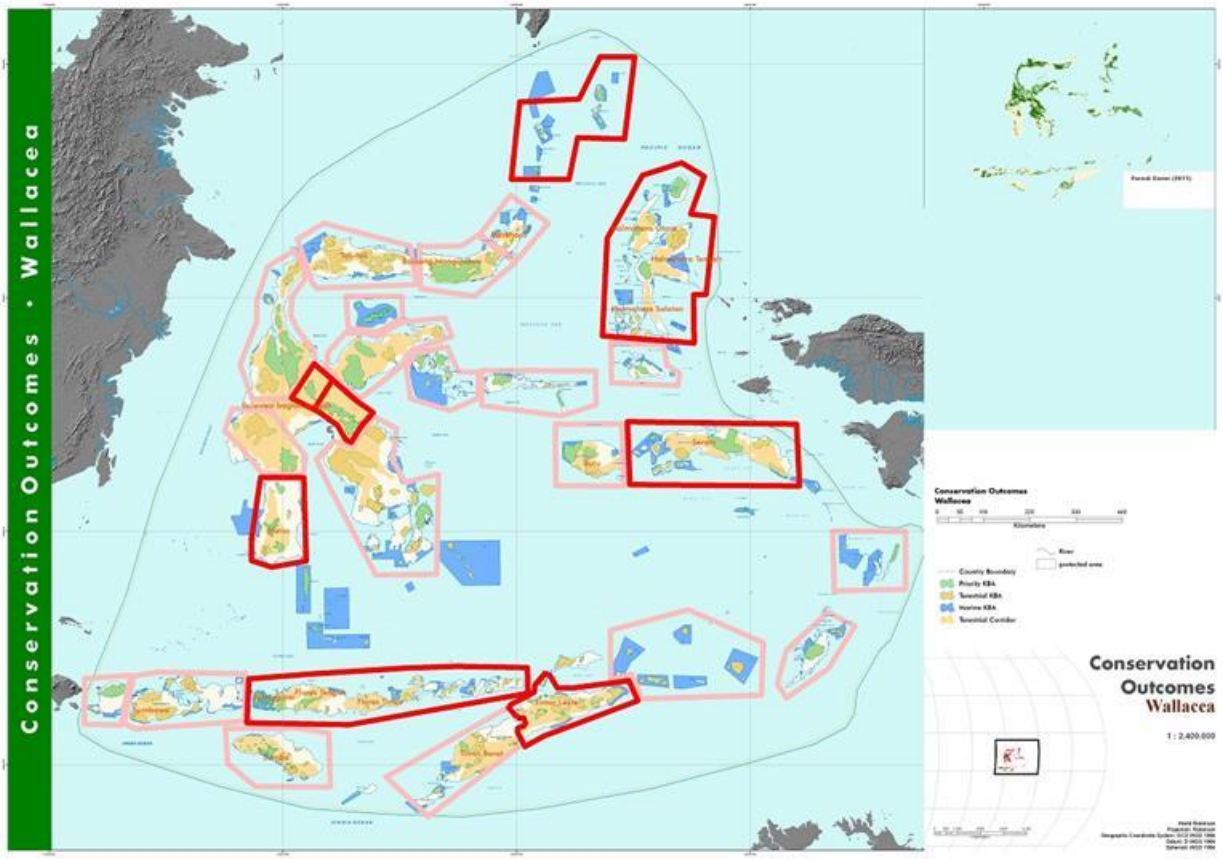


Table 12.5. Priority Terrestrial KBAs for CEPF Funding in Indonesia

KBA Code	KBA Name	Area (ha)	Bioregion	Protection Status	KBA Cluster
IDN003	Karakelang Utara	32,242	Sulawesi	PP	Sangihe–Talaud
IDN004	Karakelang Selatan	6,559	Sulawesi	PP	Sangihe–Talaud
IDN005	Pulau Salibabu	9,082	Sulawesi	No	Sangihe–Talaud
IDN007	Pulau Kabaruan	9,444	Sulawesi	No	Sangihe–Talaud
IDN010	Gunung Awu	3,043	Sulawesi	No	Sangihe–Talaud
IDN011	Tahuna	2,248	Sulawesi	No	Sangihe–Talaud
IDN012	Gunung Sahendaruman		Sulawesi	No	Sangihe–

KBA Code	KBA Name	Area (ha)	Bioregion	Protection Status	KBA Cluster
		4,392			Talaud
IDN015	Pulau Siau	11,662	Sulawesi	No	Sangihe–Talaud
IDN073	Danau Poso	69,079	Sulawesi	PP	Poso
IDN095	FeruhumpenaiMatano	142,903	Sulawesi	PP	Malili
IDN096	Danau Mahalona	5,171	Sulawesi	PP	Malili
IDN097	Danau Towuti	96,662	Sulawesi	PP	Malili
IDN130	Danau Tempe	32,024	Sulawesi	No	Sulawesi Selatan
IDN131	Pallime	5,434	Sulawesi	No	Sulawesi Selatan
IDN133	Cani Sirenreng	14,435	Sulawesi	PP	Sulawesi Selatan
IDN134	Bantimurung Bulusaraung	47,846	Sulawesi	Yes	Sulawesi Selatan
IDN135	Bulurokeng	7,147	Sulawesi	No	Sulawesi Selatan
IDN137	Komara	30,049	Sulawesi	PP	Sulawesi Selatan
IDN138	Karaeng — Lompobattang	32,814	Sulawesi	PP	Sulawesi Selatan
IDN145	Morotai	239,680	Maluku	No	Halmahera
IDN147	Pulau Rao	11,193	Maluku	No	Halmahera
IDN149	Galela	3,361	Maluku	No	Halmahera
IDN150	Gunung Dukono	54,763	Maluku	No	Halmahera
IDN153	Halmahera Timur	369,723	Maluku	PP	Halmahera
IDN154	Hutan Bakau Dodaga	2,472	Maluku	No	Halmahera
IDN156	Kao	4,911	Maluku	No	Halmahera
IDN158	Gamkonora	86,718	Maluku	No	Halmahera
IDN160	Tanah Putih	10,731	Maluku	No*	Halmahera
IDN161	Rawa Sagu Ake Jailolo	1,384	Maluku	No	Halmahera
IDN163	Ternate	9,080	Maluku	No	Halmahera
IDN164	Tidore	6,882	Maluku	No	Halmahera
IDN165	Aketajawe	168,083	Maluku	Yes	Halmahera
IDN167	DoteKobe	27,894	Maluku	No	Halmahera

KBA Code	KBA Name	Area (ha)	Bioregion	Protection Status	KBA Cluster
IDN170	Pulau Kayoa	13,605	Maluku	No	Halmahera
IDN171	Kasiruta	21,783	Maluku	No	Halmahera
IDN172	Yaba	20,158	Maluku	No	Halmahera
IDN173	Gorogoro	25,964	Maluku	No	Halmahera
IDN174	Saketa	16,940	Maluku	No	Halmahera
IDN177	Tutupa	16,568	Maluku	No	Halmahera
IDN178	Gunung Sibela	54,990	Maluku	PP	Halmahera
IDN179	Mandioli	12,078	Maluku	No	Halmahera
IDN199	Pulau Buano	13,616	Maluku	No	Seram
IDN200	Gunung Sahuwai	25,816	Maluku	PP	Seram
IDN201	Luhu	4,923	Maluku	Yes	Seram
IDN202	Tullen Batae	5,040	Maluku	No	Seram
IDN203	Pulau Kassa	44	Maluku	No	Seram
IDN204	Pegunungan Paunusa	59,525	Maluku	No	Seram
IDN205	Gunung Salahutu	10,135	Maluku	No	Seram
IDN207	Leitimur	16,671	Maluku	No	Seram
IDN210	Haruku	7,937	Maluku	No	Seram
IDN211	Saparua	1,859	Maluku	No	Seram
IDN212	Manusela	248,077	Maluku	PP	Seram
IDN213	Waebula	63,514	Maluku	No	Seram
IDN214	Tanah Besar	49,137	Maluku	No	Seram
IDN280	Komodo — Rinca	61,698	Lesser Sunda	Yes	Flores
IDN282	Wae Wuul	4,552	Lesser Sunda	PP	Flores
IDN283	Nggorang Bowosie	13,990	Lesser Sunda	No	Flores
IDN284	Mbeliling -Tanjung Kerita Mese	33,549	Lesser Sunda	No	Flores
IDN285	Sesok	6,569	Lesser Sunda	No	Flores
IDN286	Nangalili	428	Lesser Sunda	No	Flores

KBA Code	KBA Name	Area (ha)	Bioregion	Protection Status	KBA Cluster
IDN287	Todo Repok	16,541	Lesser Sunda	No	Flores
IDN288	Ruteng	40,744	Lesser Sunda	PP	Flores
IDN289	Gapong	14,960	Lesser Sunda	No	Flores
IDN290	Pota	717	Lesser Sunda	No	Flores
IDN291	Nangarawa	10,885	Lesser Sunda	No	Flores
IDN292	Gunung Inerie	11,661	Lesser Sunda	PP	Flores
IDN293	Aegela	4,054	Lesser Sunda	No	Flores
IDN294	Wolo Tado	9,340	Lesser Sunda	PP	Flores
IDN296	Pulau Ontoloe	377	Lesser Sunda	Yes	Flores
IDN297	Mausambi	3,552	Lesser Sunda	PP	Flores
IDN298	Kelimutu	6,320	Lesser Sunda	PP	Flores
IDN300	Tanjung Watu Mana	433	Lesser Sunda	No	Flores
IDN303	Pulau Besar	5,327	Lesser Sunda	Yes	Flores
IDN304	Egon Ilimedo	27,716	Lesser Sunda	No	Flores
IDN305	Ili Wengot	4,097	Lesser Sunda	No	Flores
IDN306	Gunung Lewotobi	9,832	Lesser Sunda	No	Flores
IDN308	Larantuka	2,420	Lesser Sunda	No	Flores
IDN309	Tanjung Watupayung	7,351	Lesser Sunda	No	Flores
IDN312	Lamalera	5,891	Lesser Sunda	No	Flores
IDN313	Lembata	30,821	Lesser Sunda	No	Flores
IDN315	Pantar	14,255	Lesser Sunda	No	Flores
IDN317	Gunung Muna	9,598	Lesser Sunda	No	Flores
IDN319	Mainang	7,294	Lesser Sunda	No	Flores
IDN321	Tuti Adagae	24,348	Lesser Sunda	PP	Flores
IDN322	Kunggwera	8,803	Lesser Sunda	No	Flores

This list of 85 KBAs in priority clusters includes 10 of the 19 highest priority KBAs (See Chapter 4) and 20 of the 50 KBAs identified as part of the minimum critical network. Of

105 globally threatened species believed to occur in only one KBA, 69 are included in this set of sites, including 22 of the 32 terrestrial critically endangered species, and 57 of 82 endangered species.

Table 12.6. Priority Marine KBAs for CEPF Funding in Indonesia

KBA Code	KBA Name	Area (ha)	Bioregion	Protection	Marine Corridor	KBA Status
IDN001	Kepulauan Nanusa	33,439	Sulawesi	No	Sulawesi Utara	Confirmed
IDN002	Perairan Karakelang Utara	32,434	Sulawesi	No	Sulawesi Utara	Confirmed
IDN006	Perairan Talaud Selatan	47,250	Sulawesi	No	Sulawesi Utara	Confirmed
IDN008	Kawaluso	342,413	Sulawesi	No	Sulawesi Utara	Confirmed
IDN009	Perairan Sangihe	132,752	Sulawesi	No	Sulawesi Utara	Confirmed
IDN013	Mahangetang	33,683	Sulawesi	No	Sulawesi Utara	Confirmed
IDN014	Perairan Siau	77,152	Sulawesi	No	Sulawesi Utara	Confirmed
IDN016	Perairan Tagulandang	21,793	Sulawesi	No	Sulawesi Utara	Confirmed
IDN017	Perairan Biaro	16,946	Sulawesi	No	Sulawesi Utara	Confirmed
IDN018	Perairan Likupang	55,690	Sulawesi	No	Sulawesi Utara	Confirmed
IDN020	Molaswori	55,559	Sulawesi	Yes	Sulawesi Utara	Confirmed
IDN023	Selat Lembeh	17,589	Sulawesi	No	Sulawesi Utara	Confirmed
IDN026	Tulaun Lalumpe	1,392	Sulawesi	No	Sulawesi Utara	Confirmed
IDN032	Perairan Arakan Wawontulap	15,134	Sulawesi	PP	Sulawesi Utara	Confirmed
IDN033	Amurang	24,347	Sulawesi	Yes	Sulawesi Utara	Confirmed
IDN077	Perairan Kepulauan Togean	341,275	Sulawesi	Yes	Togean–Banggai	Confirmed
IDN079	Perairan Pagimana	1,071	Sulawesi	No	Togean–Banggai	Confirmed
IDN081	Perairan Peleng — Banggai	509,722	Sulawesi	PP	Togean–Banggai	Confirmed
IDN087	Perairan Balantak	6,218	Sulawesi	No	Togean–Banggai	Candidate
IDN146	Pulau-pulau Pesisir Morotai	62,790	Maluku	No	Perairan Halmahera	Confirmed
IDN148	Loloda	14,635	Maluku	No	Perairan Halmahera	Confirmed
IDN151	Pulau-pulau pesisir Tobelo	20,059	Maluku	No	Perairan Halmahera	Confirmed
IDN152	Jara-jara	6,910	Maluku	No	Perairan Halmahera	Confirmed
IDN155	Teluk Wasile	20,997	Maluku	No	Perairan Halmahera	Candidate

KBA Code	KBA Name	Area (ha)	Bioregion	Protection	Marine Corridor	KBA Status
IDN157	Teluk Buli	152,228	Maluku	No	Perairan Halmahera	Confirmed
IDN159	Tanjung Bobo	1,174	Maluku	No	Perairan Halmahera	Confirmed
IDN162	Ternate–Hiri	6,216	Maluku	No	Perairan Halmahera	Confirmed
IDN166	Weda Telope	8,880	Maluku	No	Perairan Halmahera	Confirmed
IDN168	Perairan Dote–Kobe	14,938	Maluku	No	Perairan Halmahera	Candidate
IDN169	Kayoa	126,294	Maluku	No	Perairan Halmahera	Confirmed
IDN175	Kepulauan Widi	41,017	Maluku	No	Perairan Halmahera	Confirmed
IDN176	Libobo	686	Maluku	No	Perairan Halmahera	Candidate
IDN180	Perairan Mandioli	17,636	Maluku	No	Perairan Halmahera	Candidate
IDN190	Jorongga	65,154	Maluku	No	Perairan Halmahera	Candidate
IDN307	Pantai Selatan Lebau	1,770	Lesser Sunda	No	Solor–Alor	Confirmed
IDN310	Flores Timur	2,974	Lesser Sunda	No*	Solor–Alor	Candidate
IDN311	Perairan Lembata	37,527	Lesser Sunda	No	Solor–Alor	Confirmed
IDN314	Selat Pantar	55,071	Lesser Sunda	PP	Solor–Alor	Confirmed
IDN316	Pantar Utara	3,282	Lesser Sunda	PP	Solor–Alor	Candidate
IDN318	Perairan Gunung Muna	3,525	Lesser Sunda	PP	Solor–Alor	Confirmed
IDN320	Perairan Alor Utara	5,417	Lesser Sunda	PP	Solor–Alor	Candidate

12.3 Marine Site Priorities — Indonesia

As noted in Chapter 4, data on marine species did not allow for prioritization using the presence of globally threatened species. Instead, marine corridors form the basis for prioritization of marine conservation outcomes (see Section 12.4). Priority marine KBAs are those that fall within the priority marine corridors (Table 12.6).

Table 12.6. Priority Marine KBAs for CEPF Funding in Indonesia

KBA Code	KBA Name	Area (ha)	Bioregion	Protection	Marine Corridor	KBA Status
IDN001	Kepulauan Nanusa	33,439	Sulawesi	No	Sulawesi Utara	Confirmed

KBA Code	KBA Name	Area (ha)	Bioregion	Protection	Marine Corridor	KBA Status
IDN002	Perairan Karakelang Utara	32,434	Sulawesi	No	Sulawesi Utara	Confirmed
IDN006	Perairan Talaud Selatan	47,250	Sulawesi	No	Sulawesi Utara	Confirmed
IDN008	Kawaluso	342,413	Sulawesi	No	Sulawesi Utara	Confirmed
IDN009	Perairan Sangihe	132,752	Sulawesi	No	Sulawesi Utara	Confirmed
IDN013	Mahangetang	33,683	Sulawesi	No	Sulawesi Utara	Confirmed
IDN014	Perairan Siau	77,152	Sulawesi	No	Sulawesi Utara	Confirmed
IDN016	Perairan Tagulandang	21,793	Sulawesi	No	Sulawesi Utara	Confirmed
IDN017	Perairan Biaro	16,946	Sulawesi	No	Sulawesi Utara	Confirmed
IDN018	Perairan Likupang	55,690	Sulawesi	No	Sulawesi Utara	Confirmed
IDN020	Molaswori	55,559	Sulawesi	Yes	Sulawesi Utara	Confirmed
IDN023	Selat Lembeh	17,589	Sulawesi	No	Sulawesi Utara	Confirmed
IDN026	Tulaun Lalumpe	1,392	Sulawesi	No	Sulawesi Utara	Confirmed
IDN032	Perairan Arakan Wawontulap	15,134	Sulawesi	PP	Sulawesi Utara	Confirmed
IDN033	Amurang	24,347	Sulawesi	Yes	Sulawesi Utara	Confirmed
IDN077	Perairan Kepulauan Togean	341,275	Sulawesi	Yes	Togean–Banggai	Confirmed
IDN079	Perairan Pagimana	1,071	Sulawesi	No	Togean–Banggai	Confirmed
IDN081	Perairan Peleng–Banggai	509,722	Sulawesi	PP	Togean–Banggai	Confirmed
IDN087	Perairan Balantak	6,218	Sulawesi	No	Togean–Banggai	Candidate
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IDN152	Jara-jara	6,910	Maluku	No	Perairan Halmahera	Confirmed
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IDN157	Teluk Buli	152,228	Maluku	No	Perairan Halmahera	Confirmed
IDN159	Tanjung Bobo	1,174	Maluku	No	Perairan Halmahera	Confirmed
IDN162	Ternate–Hiri	6,216	Maluku	No	Perairan Halmahera	Confirmed
IDN166	Weda Telope	8,880	Maluku	No	Perairan Halmahera	Confirmed
IDN168	Perairan Dote-Kobe		Maluku	No	Perairan Halmahera	Candidate

KBA Code	KBA Name	Area (ha)	Bioregion	Protection	Marine Corridor	KBA Status
		14,938				
IDN169	Kayoa	126,294	Maluku	No	Perairan Halmahera	Confirmed
IDN175	Kepulauan Widi	41,017	Maluku	No	Perairan Halmahera	Confirmed
IDN176	Libobo	686	Maluku	No	Perairan Halmahera	Candidate
IDN180	Perairan Mandioli	17,636	Maluku	No	Perairan Halmahera	Candidate
IDN190	Jorongga	65,154	Maluku	No	Perairan Halmahera	Candidate
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IDN310	Flores Timur	2,974	Lesser Sunda	No*	Solor–Alor	Candidate
IDN311	Perairan Lembata	37,527	Lesser Sunda	No	Solor–Alor	Confirmed
IDN314	Selat Pantar	55,071	Lesser Sunda	PP	Solor–Alor	Confirmed
IDN316	Pantar Utara	3,282	Lesser Sunda	PP	Solor–Alor	Candidate
IDN318	Perairan Gunung Muna	3,525	Lesser Sunda	PP	Solor–Alor	Confirmed
IDN320	Perairan Alor Utara	5,417	Lesser Sunda	PP	Solor–Alor	Candidate

12.4 Terrestrial Corridor Priorities — Indonesia

As described in Chapter 4, terrestrial corridors are defined for landscape species and for their role in securing ecosystem services and connectivity between KBAs. Ten corridors were identified for 26 landscape species, covering most of the larger islands in Wallacea. Conservation action at the level of corridors, as opposed to sites, 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. It is proposed, therefore, that the priority terrestrial corridors are those which overlap with the priority KBAs identified in section 12.1 above (Table 12.7)

Table 12.7. Priority Terrestrial Corridors for CEPF Funding

Corridor	Province /country	Area (Ha)	# CR species	# EN species	# VU species	Rank
Halmahera	North Maluku	691,328	0	0	3	4
Seram-Buru	Maluku	1,427,848	0	1	4	2
Flores Forests	East Nusa Tenggara	685,928	2	1	2	3
Flores Coast	East Nusa Tenggara	179,880	0	0	1	7
Central Sulawesi	West Sulawesi, Central Sulawesi, South Sulawesi,	6,243,989	0	3	6	1

Corridor	Province /country	Area (Ha)	# CR species	# EN species	# VU species	Rank
	Southeast Sulawesi					
Southern Sulawesi	South Sulawesi	879,949	0	2	6	

12.5 Marine Corridor Priorities — Indonesia

As discussed in chapter four, data on species distribution was not adequate to use as a basis for prioritizing marine KBAs. It was also noted that many marine species cannot be effectively protected by conservation of KBAs alone, and that corridors are a vital component of a marine conservation strategy. Identification of corridors also overcomes the problem that paucity of data means that the location of many marine KBAs is tentative, and defining larger areas as corridors around them gives a greater chance of capturing the conservation value.

Chapter 4 identified 16 marine corridors. Given that data on biological value and threat is too incomplete and general to allow effective prioritization between corridors, selection of marine corridor priorities for CEPF funding is focused on practical considerations of where funding has the best chance of making a difference. Informants agreed that given the high cost of doing marine conservation, CEPF should seek to fund marine work only where the funds can be used efficiently. As a result, marine corridors were prioritized based on:

- Biological importance, as judged by expert opinion.
- Proximity to a terrestrial KBA cluster which has been selected as a priority for funding (see above).
- High funding need.

The marine corridors were scored against these criteria (Table 12.8).

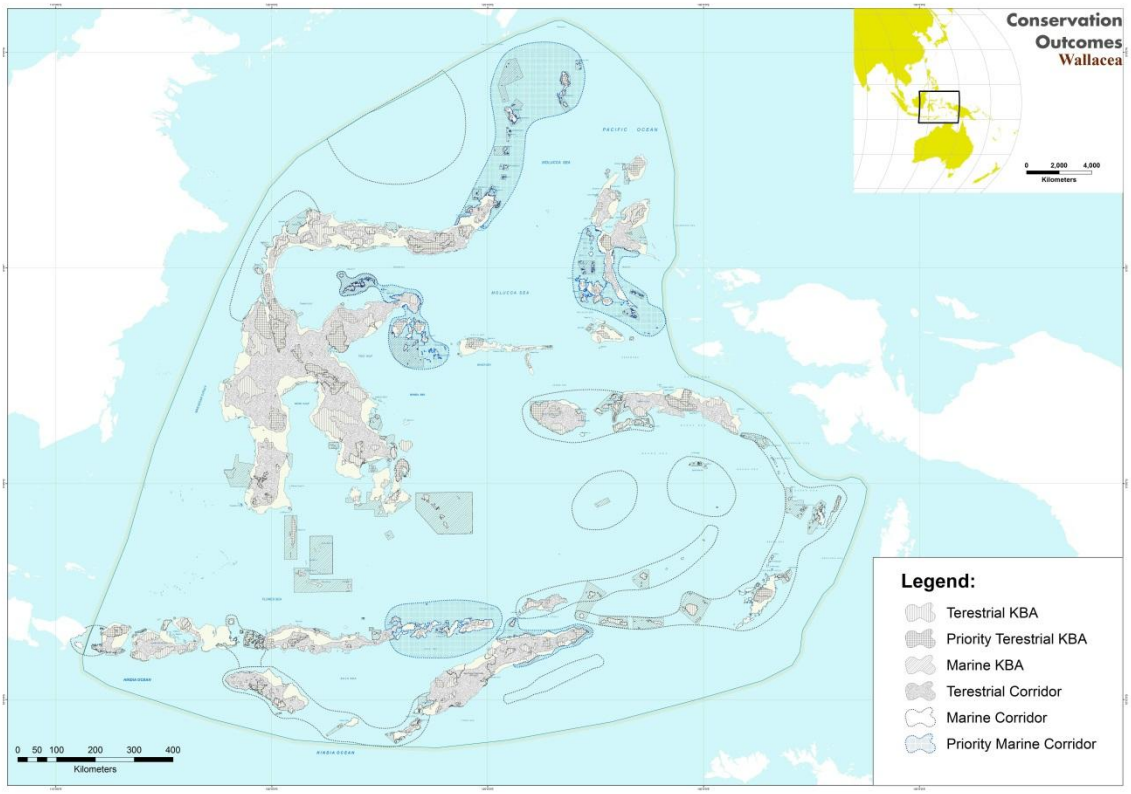
Table 12.8. Prioritization of Marine Corridors for CEPF Funding in Indonesia (Priority corridors for funding are shaded)

Marine Corridor	Biological importance	Proximity to Terrestrial KBA Cluster Selected for Gunding	Funding Need
Barat Sulawesi Tengah	Medium	No	High
Bentang Laut Banda	High	No	Low
Bentang Laut Buru	Medium	Yes (Seram)	High
Bentang Laut Lucipara	High	No	Low
Busur Banda Dalam	Medium	No	Low
Busur Banda Luar	Medium	No	Low
Halmahera	Extremely high	Yes (Halmahera)	High
Komodo–Selat Sumba	Medium	Yes (Flores)	Low
Laut Sawu	High	No	Low

Laut Sulawesi	Medium	No	High
Palung Timor	Medium	No	High
Selat Lombok	Medium	No	Low
Solor–Alor	Extremely high	Yes (Flores)	Low
Sulawesi Utara	High	Yes (Sangihe-Talaud)	High
Togean–Banggai	Extremely high	No	High

Two marine corridors fulfilled all three criteria: Halmahera and North Sulawesi. The SolorAlor marine corridor is of extremely high importance for biodiversity and adjacent to a priority KBA cluster; however, significant funding is available for marine conservation in this region through the Packard (Western Pacific Program), MacArthur, and the Margaret A. Cargill foundations as well as the World Bank's COREMAP III program (see Conservation Investments section). CEPF grant-making on this corridor is contingent on identification of opportunities for added value. One marine corridor, Togean–Banggai, is an extremely high biodiversity priority and has a high need for funding, but it is not adjacent to a priority KBA cluster. CEPF will make grants for marine and coastal conservation in this area where it can be done without incurring significant transactions costs (Map 12.3).

Figure 12.3: Marine Corridors Prioritized for CEPF Funding



12.6 Species Priorities — Timor-Leste

Of the list of species outcomes that are prioritized because the species require specific conservation action in addition to site protection, three occur in Timor-Leste, and they are priorities for CEPF funding (Table 12.9).

Table 12.9. Priority Terrestrial Species Outcomes for CEPF Support in Timor-Leste

Species Name	Species Group	IUCN Status	CITES Appendix	Protection Status in Indonesia	Trapping for Trade	Trapping for Consumption	Pet/Hobbyist Collection	Proposed Conservation Actions
Cacatua sulphurea	Bird	CR	App I	Y	Y	N	Y	Law enforcement against smuggling; population and monitoring surveys
Chelodina mccordi	Reptiles	CR	App II	N	N	Y	Y	Advocacy for legal protection; local awareness; enforcement of protection; population survey
Cuora amboinensis	Reptiles	VU	App II	N	Y	N	Y	Advocacy for legal protection

In addition, all marine species identified as priorities for CEPF funding support (see Table 12.2) have been or could occur in Timor-Leste. The list of CEPF priority marine species is, therefore, the same for both countries.

12.7 Terrestrial Site Priorities — Timor-Leste

Timor-Leste has 23 terrestrial KBAs and forms part of a single KBA cluster, Timor (see section 12.1). The small area of the country makes it possible to rank KBAs individually using the approach outlined in Langhammer *et al.* (2007) and described in Chapter 4. Assessment of species vulnerability is heavily influenced by the records of the critically endangered yellow-crested cockatoo (*Cacatua sulphurea*) at 16 KBAs. Threat assessment is based on information from stakeholder consultations and expert interviews. The quality of the information is highly variable, but overall there is a pattern of higher threat at those KBAs at risk because of urbanization close to Dili (Areia Branca no Dolok Oan and Tasitolu) and those in the lowlands of the south coast (Sungai Klere) and north coast (Maubara) where expansion of agriculture and settlement is a threat. The KBAs in the forests that remain on the central mountains are generally under medium or low threat, from local hunting and firewood collection.

Three KBAs emerge as highest priority from this analysis (score of 2 with high irreplaceability, extreme species vulnerability, and medium threat). When they are ranked according to the number of globally threatened species, they hold that the first priority is Nino Konis Santana National Park, the second is Tilomar, and the third is Citrana in the Oecussi enclave. The important montane forest KBA, Mundo Perdido, also scores high on biological criteria, but is classified as a fourth priority because the level of threat is considered low.

Data on stakeholder commitment was not specific enough to include in the analysis. Government commitment can be inferred from the information on protection status, with eight KBAs covered by proposed protected areas in the revised Conservation Act currently being considered by the Timor-Leste government. Funding need is universally high across KBAs in Timor-Leste and so was not used as a criterion for priority setting. Only Nino Konis Santana has an allocation of staff and resources, and this is believed to be far from adequate for the management of this important protected area.

Table 12.11 summarizes the prioritization of KBAs in Timor-Leste, and Table 12.12 gives further details of the priority KBAs.

Table 12.11. Prioritization Scoring of KBAs in Timor-Leste

KBA Name	Species Irreplaceability	Species Vulnerability	Threat	Overall Score	Number of Globally Threatened Species	Final Ranking
Nino Konis Santana	High	Extreme	Medium	2	8	1
Tilomar	High	Extreme	Medium	2	4	2
Citrana	High	Extreme	Medium	2	2	3
Mundo Perdido	High	Extreme	Low	3	5	4
Maubara	Medium	Extreme	High	3	3	5
Monte Mak Fahik–Sarim	Medium	Extreme	Low	3	3	5
Be Malae	Medium	Extreme	Medium	3	2	6
Irabere–Iliomar	Medium	Extreme	Medium	3	2	6
Monte Aitana–Bibileo	Medium	Extreme	Low	3	2	6
Monte Diatuto	Medium	Extreme	Low	3	2	6
Monte Matebian	Medium	Extreme	Medium	3	2	6
Monte Tatamailau	High	High	Medium	3	2	6
Areia Branca no Dolok Oan	Medium	Extreme	High	3	1	7
Fatumasin	Medium	Extreme	Medium	3	1	7
Legumau	Medium	Extreme	Medium	3	1	7
Leimia Kraik	Medium	Extreme	Medium	3	1	7
Sungai Klere	Medium	Extreme	High	3	1	7
Atauro Island	High	High	Low	4	1	8
Tasitolu	Medium	Medium	High	5	3	9
Laleia	Medium	Medium	Medium	5	2	10

KBA Name	Species Irreplaceability	Species Vulnerability	Threat	Overall Score	Number of Globally Threatened Species	Final Ranking
Monte Builo	Low	Medium	Low	5	1	11
Nari	Low	Medium	Medium	5	1	11
Subaun	Medium	Medium	Medium	5	1	11

Table 12.12. Priority Terrestrial KBAs for CEPF Funding in Timor-Leste

KBA code	KBA name	Area (Ha)	Protection	District
TLS001	Nino Konis Santana	67,482	Yes	Lautem
TLS010	Mundo Perdido	25,898	Yes	Baucau and Viqueque
TLS033	Tilomar	5,348	Yes	Covalima
TLS035	Citrana	10,924	No*	Oecussi

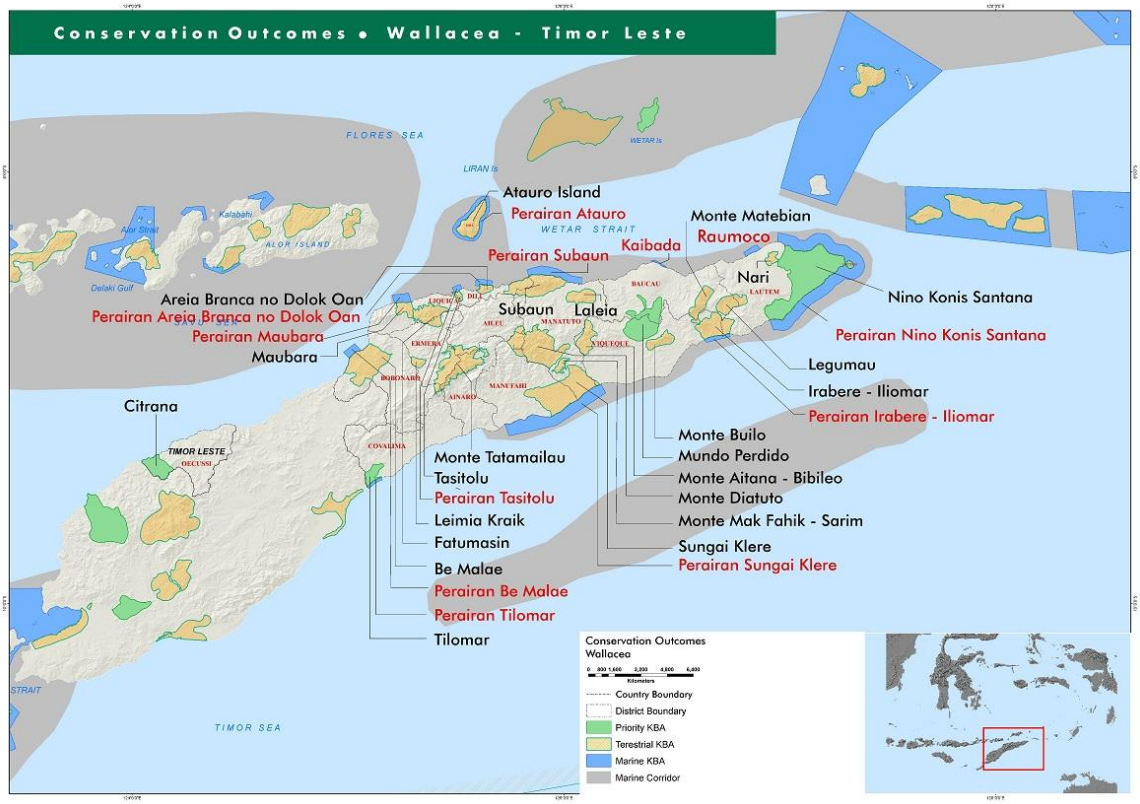
12.8 Marine Site Priorities — Timor-Leste

As for Indonesia, marine KBAs are prioritized based on marine corridors. All the marine KBAs in Timor-Leste are included in the Timor-Leste marine corridors therefore qualify as priorities for CEPF funding.

Table 12.13. Priority Marine KBAs for CEPF Funding in Timor-Leste

KBA Code	KBA Name	Area (Ha)	Protection	District	KBA Status
TLS002	Perairan Nino Konis Santana	60,256	Yes	Lautem	Confirmed
TLS004	Raumoco	2,036	No	Lautem	Confirmed
TLS008	Perairan Irabere–Iliomar	2,489	No	Viqueque and Lautem	Candidate
TLS011	Kaibada	571	No	Baucau	Confirmed
TLS012	Perairan Subaun	10,654	No	Dili and Manatuto	Confirmed
TLS019	Perairan Sungai Klere	31,643	No	Manufahi and Manatuto	Candidate
TLS023	Perairan Areia Branca no Dolok Oan	2,384	No	Dili	Confirmed
TLS025	Perairan Atauro	10,542	No	Dili	Confirmed
TLS026	Perairan Tasitolu	1,208	No	Dili	Confirmed
TLS030	Perairan Maubara	3,624	No	Liquica	Candidate
TLS031	Perairan Be Malae	2,945	No	Bobonara	Candidate
TLS034	Perairan Tilomar	1,200	No	Covalima	Candidate

Figure 12.4. Site Outcomes in Timor-Leste (Terrestrial KBA prioritized for CEPF funding in darker green)



12.9 Terrestrial Corridor Priorities — Timor-Leste

Timor-Leste contains part of one terrestrial corridor, the TimorWetar corridor, which is identified for five species that depend on landscape connectivity beyond KBAs for their conservation: the yellow-crested cockatoo (*Cacatua sulphurea)*, Timor imperial pigeon (*Ducula cineracea*), Timor green pigeon (*Treron psittaceus*), Timor deer, Rusa timorensis and Temminck's flying-fox (*Pteropus temminckii*). The Timor-Leste population of the cockatoo, the deer and the two pigeons is likely to be of particular significance, and CEPF should consider proposals for corridor-level conservation actions in Timor-Leste that address the conservation of these species.

12.10 Marine Corridor Priorities — Timor-Leste

Timor-Leste's marine KBAs are grouped into a single corridor, Timor-Leste marine, which encompasses the entire coastline and the waters around Atauro Island. This corridor is contiguous with the Solor–Alor corridor in Indonesia and forms an important route for cetacean migration between the Banda Sea and the Savu Sea. It also contains

seamounts that are likely to be feeding and breeding grounds for economically important fish populations. Corridor level activities that support marine conservation in this area are a priority for CEPF. A second corridor, the Timor Trench, is an important migratory route for cetaceans. It is not a priority for CEPF because threats are not clearly defined (see the threats chapter), and interventions are likely to be high cost and unsuitable for the CEPF grants mechanism.

12.11 CEPF Strategic Directions and Investment Priorities

Sections 12.1–12.8 have identified a series of priority conservation outcomes for species, sites and corridors to be addressed with the support of CEPF. This section defines how CEPF will address the challenges of conservation to achieve these outcomes. Some strategic directions and investment priorities are specifically directed at species, sites or corridors. Which direction or priority is relevant for a particular priority species, KBA or corridor depends on specific local ecological, social and economic circumstances. In developing proposals, potential grantees must show that they have an adequate understanding of these local circumstances and which of the strategic directions and investment priorities are relevant to their situation. Strategic directions are summarized in Table 12.12 and described in greater detail below.

Table 12.12. Strategic Directions and Investment Priorities for CEPF in Wallacea, 2014–2019

CEPF Strategic Directions	CEPF Investment Priorities
1. Actions to address specific 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
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

CEPF Strategic Directions	CEPF Investment Priorities
3. Support sustainable natural resource management by communities at 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
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
5. Engage the private sector as an active participant 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
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

CEPF Strategic Directions	CEPF Investment Priorities
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

Strategic Direction 1: Actions to address specific threats to high-priority species

Overexploitation can devastate the populations of species even when their habitat is adequately protected. It causes local extinctions, reduces the density of the population and so affects its viability and makes the species more vulnerable to other natural or anthropogenic disturbances. Chapter 4 identified 560 globally threatened species, of which at least 229 are considered to be threatened by direct exploitation, including 176 corals, but also 10 sea cucumbers, 10 fish, nine reptiles, six birds, five mammals and others.

Some species may be able to withstand limited exploitation, and this may be an effective conservation strategy where exploitation rights can be defined, managed and policed. Domestication and breeding *ex-situ* may also provide a solution, though this always raises the problem of how to ensure that breeding facilities are not being used to "launder" individuals taken from the wild. Where a species or product is important for local livelihoods and economies, it may be possible to find alternatives or to incentivize changes of behavior. For many species, however, legal protection and enforcement of bans on exploitation are required. Policing such regulations may be complex and often depends on the cooperation of local stakeholders. For species that are nationally and internationally traded, monitoring trade through shipment ports may be more productive than attempting to monitor trapping in the field.

One of the obstacles when defining species and site conservation outcomes is the paucity of complete, up-to-date information on biodiversity. Chapter 4 noted that there are 143 species in Wallacea classified as data deficient, of which 34 were assessed to be priorities for data gathering. In addition, an unknown number of species are presumed threatened with extinction but have never been assessed for Red List status. This undoubtedly includes some species that are yet to be described. There are many opportunities for local stakeholders with simple training to collect useful information, and students and scientists

in local universities could contribute to advancing knowledge of the distribution and taxonomy of species in Wallacea. Support is required to build local capacity, carry out surveys, and ensure that new information is disseminated widely and effectively. All such data collection is meant to be "action-oriented" per the investment priorities described here.

Investment Priority 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.

Species conservation efforts are hampered by lack of clarity on the taxonomy of species, lack of information on the distribution of species, and lack of data on threats and populations on which to base Red List assessments. This is of particular import for species threatened by illegal wildlife trade or habitat destruction, where it is difficult to propose management interventions without knowing basic facts about population size, distribution, or breeding. CEPF will support, to a small and efficient degree, data collection efforts that lead directly to action. Useful data can be collected by people in the area — staff of protected areas, interested residents and students — if they are equipped with basic skills on identification and survey planning. For species threatened by direct exploitation and trade, simple but well-designed surveys in markets and shipment points using local informants and enumerators can be efficient and relatively inexpensive. For some widely known and easily recognized species, collection of records from amateur observers or hunters and trappers can also yield valuable data. Continued monitoring is vital to assess the impact of any action taken.

Indonesian laws protect 79 of Wallacea's 560 globally threatened species, but with only a few exceptions, the policies, programs and resources to implement these laws have not been developed. In Timor-Leste, definition of protected species is included in the Biodiversity Law now under discussion. Decentralized government (already operating in Indonesia and, increasingly, in Timor-Leste) means that national regulations often do not translate into effective local implementation without promulgation of local regulations.

CEPF will be open to supporting work to ensure that field data and analysis on the status of species is available and used to stimulate and inform discussions with researchers, conservationists, policy makers, and people who exploit the species. Such discussions are expected to contribute to reaching agreement on the status of the species, the impact of exploitation, and priorities for action, and ultimately to improved laws and policies. Emphasizing the economic and cultural significance of species is often key to securing the support of local lawmakers. At a national level, CEPF will support policy efforts that address the protection of Red List and priority species. The NBSAP process provides another important forum for proposing species that require specific policy and regulatory change to ensure their conservation.

Investment Priority 1.2: Change behavior of trappers, traders or buyers through appropriate enforcement, education, incentives and alternatives.

CEPF will support approaches that understand the different motivations of different stakeholders exploiting rare and exotic plants and wildlife. For example, local trappers may be most susceptible to local awareness campaigns and the provision of alternative livelihood training. Traders and middlemen, on the other hand, may be more susceptible to enforcement combined with licensing, quotas and monitoring. Ultimately, however, for very high value items, such as certain birds, there must be sincere interdiction efforts by government agencies combined with a lessening of demand. CEPF will be open to supporting such efforts, but given their cost and complexity, would expect to leverage or complement the work of others already working in the field.

Strategic Direction 2: Improve management of sites (KBAs) with and without official protection status

Approximately a third of the area of terrestrial and marine KBAs are legally protected (see Chapter 4), including many of the largest and most important remaining areas of natural habitat in Wallacea. Protected areas are thus a critical part of the overall effort for the conservation of KBAs, and are likely to become more so as pressure from land-use change increasingly affects other areas. Ideally protected areas simultaneously accommodate and respect customary local rights and resource use, although this is often not the case and some protected areas are the subject of conflicts over rights to use land. CEPF will support efforts to improve the conservation status of protected areas that involve engagement between mangers of protected areas (where they exist) and other stakeholders, especially local resource users but also the wider local population and private sector players.

In Indonesia, half of all terrestrial KBAs are outside protected areas but within the national forest estate, which gives a degree of legal protection and control over what may and may not happen to them. While the primary goal of the management of these areas is not biodiversity conservation, it may be watershed protection, or sustainable forestry, both of which are potentially compatible with biodiversity conservation. CEPF will support actions that maintain the conservation values of these KBAs by working with regulations, incentives and technical support to encourage stakeholders managing the forest — communities, district forest agencies, or business license holders — to be sympathetic to the conservation values of the areas they are responsible for. The opportunity does not exist in Timor-Leste where, as noted in Chapter 6, there is no legally constituted "forest estate" outside of the protected areas that are now being created.

Investment Priority 2.1: Facilitate effective collaboration between CSO, local and indigenous communities and park management units to improve planning and management of official protected areas.

In most protected areas, legal protection reduces the threats from planned and licensed exploitation and development, but it does little to prevent illegal and unlicensed threats, such as small-scale mining, encroachment and hunting. CEPF will support actions that address these threats, including by securing the support of communities that live around the borders of the park. This may involve negotiating use agreements to allow them to

use the park in a controlled way or alternative sources of livelihoods. This process of identifying, planning and implementing these interventions is typically better handled by an NGO with experience of social facilitation, working in partnership with the park authority. Creating these kinds of partnerships should be a priority for the KBAs, which are protected areas but have significant community involvement in resource management in and around the park, including as Aketajawe-Lolabata National Park in Halmahera, Ruteng in Flores, Manusela in Seram and Nino Konis Santana in Timor-Leste.

Large areas of important KBAs are within protected areas that have no dedicated budget or management team. This applies to all protected areas on Timor-Leste except the national park, and to most in the Indonesian priority corridors. These areas have legal protection but, in the absence of active management and monitoring, the legal status may be meaningless. CEPF will support actions to mobilize local stakeholder support for the site — from communities, local government and private sector — to complement efforts by the Natural Resource Conservation Agency. This is a high-priority approach for all the priority KBA clusters, but especially North Sulawesi Islands, Malili Lakes and Timor-Leste, where much of the greatest conservation value is in protected areas that do not have any dedicated resources or staff.

Investment Priority 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.

KBAs outside protected areas are typically threatened by a combination of licensed exploitation and unlicensed use. Interventions to protect these KBAs are complex because multiple stakeholders and rights may be involved, and because the objective of management is, in most cases, profit rather than protection. Success is likely to be the result of long-term engagement, not a single grant, and so CEPF will support initiatives in which there is a clear stakeholder, community or company, with management control and rights over the area and commitment to conservation. Conservation actions might include formalizing community-based management through a village forest or community forest license (in Indonesia), engagement with business interests developing forest restoration concessions as a basis for carbon emissions reduction projects or engaging with timber companies pursuing international certification standards.

Investment Priority 2.3: Support surveys, research and awareness campaigns to create new protected areas or better manage KBAs without protection status.

Creation of new terrestrial protected areas is only an option where there is an alignment of local community, local government and national government interest and support. These opportunities are not common, but they exist and represent an important opportunity to make permanent changes to the conservation status of a site. CEPF will support this kind of work on the basis of careful assessment of the possibility of success. Opportunities exist in Timor-Leste, where a number of new protected areas have been proposed, Halmahera and in marine areas where establishment of marine protected areas is possible.

Investment Priority 2.4: 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.

CEPF will support identification of critical needs for policy development, and engagement with lawmakers and public to address these needs. This may include support to public consultation, or enabling legal and technical experts from universities and civil society organizations to assist lawmakers in understanding the issues and formulating policy. CEPF will also support actions that engage with influential stakeholders to build a constituency for the change proposed. CEPF will also support dissemination of information on policies. Where training is necessary for enforcement agencies or affected stakeholders, it can help to ensure that the policy has the desired impact. Monitoring can help demonstrate this impact and provide important feedback that lawmakers can use to show that their decisions have benefited communities and conservation.

Approval and adoption by local government is vital not only to ensure sustainability and encourage the chance of replication, but also to ensure that the management regime is actively supported by local decision makers. Recognition may be in provincial or district biodiversity strategies and action plans, emissions reduction strategies, medium-term development plans and budgets, and spatial plans. CEPF will support efforts to encourage adoption of conservation outcomes within these documents, which might include studies to value environmental services from KBAs, good practice examples from other areas, and dissemination of information on national policies and law.

Strategic Direction 3: Support sustainable natural resource management by communities at priority sites and corridors

Pressure from unsustainable local livelihoods is a challenge for KBAs across Wallacea. Models of sustainable, community-based management in a variety of situations are important to convince government and local stakeholders that such approaches are possible. A CEPF grant will not be suitable as the main source of support to a long-term effort to change livelihoods, but can give important support to specific initiatives within the context of a long-term program by a committed civil society actor. Likely activities include identification of links between livelihoods and resources, strengthening of local institutions for management, creating links to markets and economic opportunities that give the sustainable management greater value, and building networks of support for the community-based initiatives.

Investment Priority 3.1: Support community institutions to secure adequate rights over resources and to develop and implement rules on resource use.

Effective community institutions that have adequate knowledge, simple but effective systems for administration and decision-making, and effective leadership are critical to the success of community-based conservation interventions. Depending on the nature of

resource use by the community and the situation at the site, CEPF may support action to clarify rights, establish sustainable harvesting systems, strengthen the links between livelihoods and environmental services, or to link livelihoods improvements outside the site to reduction in pressure within the site. Monitoring and feedback, transparency, and the delivery of a sustained stream of benefits as a result of successful implementation are important to maintain the conservation incentive.

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 many cases, unsustainable exploitation is driven by the opportunity to sell to distant markets. CEPF will support actions that aim to harness market opportunities to support conservation actions, either by making alternative income sources more attractive than unsustainable resource extraction or by giving new values to sustainably produced products.

Investment Priority 3.3: Propose specific legal and policy instruments to address obstacles to effective community-based natural resource management at the local or national level.

Challenges to establishing sustainable community-based resource management schemes include legal and bureaucratic obstacles to securing licenses and to developing and marketing sustainable products. Indonesian government agencies have ruled that specific communities cannot be granted exclusive rights over marine resources, for example, and the granting of licenses for community management of areas in the national forest estate is expanding far more slowly than communities would wish. There are already civil society organizations working on these issues, and CEPF will support efforts to make sure that lessons and experiences from CEPF grants contribute to these efforts, locally and nationally.

Communities are unlikely to succeed in developing and sustaining sustainable conservation management practices without the support of local civil society and government. CEPF will support actions to achieve appropriate formal recognition (e.g., a village regulation or district regulation), which strengthens a local community decision that might otherwise be challenged by interests opposed to new ways of managing resources. Raising the awareness and understanding of CSOs and government agencies helps to ensure that support for the community is forthcoming and enables local agencies to replicate the process elsewhere.

Strategic Direction 4: Strengthen community-based action to protect marine species and sites

Exploitation of near-shore fisheries and marine resources is essential for the livelihoods of many communities in Wallacea, including some of the poorest. These livelihoods are

supported by the extraordinary diversity of the world's most species-rich coral reefs, and the productivity of mangroves and sea-grass beds. Many traditional management systems have evolved to control these resources in Wallacea, but they are often unable to cope effectively with the increasing destructive exploitation in response to market opportunities and technological change. Community-based MPAs have been shown to effectively build on these traditions and to be capable of conserving and rehabilitating marine ecosystem while improving local fisheries. In contrast to the terrestrial domain, creation of additional marine protected areas is an explicit target of the Indonesian government, and an approach supported by the Timor-Leste government.

Investment Priority 4.1: Support the identification and establishment of new local marine protected areas.

Most of the marine priority sites, including all those in the Halmahera marine corridor and many in North Sulawesi, are unprotected. Only the Solor–Alor and Togean–Banggai corridors have a significant proportion of the marine KBAs in protected areas. Creation of community-based marine protected areas is particularly effective where communities have a high level of dependence on local fisheries and effective local systems for decision-making and sanctions; however, facilitation of the creation of community-based MPAs is a long-term commitment, and grant-making from CEPF will emphasize support to grantees who have a commitment to the community and the area beyond the life of the grant.

Investment Priority 4.2: Strengthen local institutions and mechanisms for management and monitoring of marine protected areas.

Challenges faced by managers of community-based MPAs include preventing breaches of regulations by members of their own community and policing the area to protect it from intrusions by outsiders. Other challenges include the more mundane ones of managing funds and resources effectively. CEPF will support actions that strengthen MPA management institutions, provide practical knowledge on subjects such as reef restoration and fisheries management, and enable MPA managers to access other sources of support and funding.

Investment Priority 4.3: Support the engagement of local government to increase the financial sustainability and legal effectiveness of local marine protected areas.

Recent experience in Indonesia and Timor-Leste has shown that community-level agreements to declare and manage MPAs are more effective and sustainable if they are supported by local policies and regulations. CEPF will support actions to raise awareness and advocate for appropriate practical, financial and regulatory support for community-based MPAs, including establishment of no-take zones and bans on the use of destructive catching techniques. In addition, local government recognition of the MPA in the local spatial plan helps protect it against damaging developments such as mining or building of tourism facilities. (MPA is now a mandatory category of marine spatial plans in Indonesia, but this has not been widely implemented.)

Investment Priority 4.4: Facilitate the sharing of lessons and experiences between stakeholders involved in marine conservation initiatives.

In successful MPAs, the positive effect of protection on local fish catches and marine ecosystems can be seen with a few years. There are already some successful models of community-based MPAs in Indonesia and Timor-Leste, and these provide important demonstrations for communities themselves, local government and civil society organizations. CEPF will support documentation and dissemination of lessons from the pioneer MPAs, cross-visits and information sharing to encourage the expansion of this approach.

Strategic Direction 5: Engage the private sector as an active participant in conservation of priority sites and corridors, in production landscapes and throughout the hotspot

Chapter 7 noted that the private sector was the most frequently identified stakeholder in KBAs. They are often also the stakeholder with the greatest resources and capacity and may have a long-term interest in a site or its ecological services. They may also have a significant influence over local government decision-making. In Indonesia, large private sector companies are obliged to have a corporate social responsibility program, but often the absence of adequate capacity and planning means that this funding is not effectively used. There is an opportunity to influence these resources for conservation goals. In Timor-Leste, the CSR sector is nascent, but the country's large oil reserves mean that there is potential for development.

Investment Priority 5.1: Engage with the private sector, business associations and chambers of commerce so that corporate social responsibility funding supports the goals of the ecosystem profile.

CEPF will fund actions that provide information on the conservation outcomes identified through this ecosystem profile to the private sector, as a first step in engaging and testing interest. The Indonesian Business Council for Sustainable Development (IBCSD), Indonesian and Timor-Leste Chambers of Commerce, and industry-specific networks such as the Mining Association and the Oil Palm Producers Association (in Indonesia) are all important venues for communicating this information. Other targets for communications are the companies and university departments that provide consultancy services to the private sector in the form of economic, social and environmental studies and impact assessments.

In Indonesia, large companies are obliged to operate corporate social responsibility schemes, and in Timor-Leste there is already voluntary interest from industry. Most resource-exploitation companies want to spend these funds in the location, or at least the district, where they operate, in order to secure political and social acceptance for their operations. Without undermining this pragmatic business objective, CSR spending could in many cases be planned and implemented more effectively, serving the interests of the

company and local stakeholders while having more sustainable social and environmental impacts. The role of a CEPF grant in this process may be at site level, funding demonstrations of interventions that can be scaled up through CSR funding, or may be at the level of the company or the industry, raising awareness of effective approaches that have been implemented elsewhere.

Investment Priority 5.2: Encourage mining and plantation companies and their funders and buyer, to consider conservation values in management of concessions and rehabilitation of production areas.

In most cases, the conservation of a KBA will not be compatible with the operations of a mining or plantation company within the KBA itself; however, making business operations more environmentally friendly may be important at the level of a corridor or landscape. Examples include setting aside corridors of natural habitats within plantations and mining areas, or careful management of run-off and waste to avoid damage to marine and freshwater environments. Many of these activities are required by law and are pre-requisites for international certification. CEPF will consider funding to provide information to help identify specific conservation values and areas that are most important for this kind of action and to advocate for companies to undertake rehabilitation work.

Investment Priority 5.3: Establish links between local 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.

Market-led campaigns are emerging as a powerful influence on the oil palm and pulp-paper sector in Indonesia, albeit not yet so much in the mining sector, especially where companies are dependent on sensitive overseas markets or financiers. Engaging directly with consumer campaigns outside Indonesia and Timor-Leste is beyond the scope of CEPF funding in Wallacea, but CEPF will fund actions that link local actors who have specific local stories to tell with international organizations engaged in these campaigns. The approach will be relevant wherever the threat to KBAs comes from large, multi-national companies sensitive to brand image and compliance with voluntary and legal standards. Positive stories that highlight good practice and demonstrate what can be done by companies are as important as stories about bad practice and environmental damage.

Investment Priority 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.

In Indonesia, in particular, many companies operate without licenses, outside the limits of their license, or on the basis of licenses that infringe environmental regulations. Such companies are often able to continue to operate only because they are involved in corruption or other malpractice. Although sometimes small in scale, they may be extremely damaging because they do not observe regulations that are intended to reduce

environmental impacts, for example, on sustainable harvesting, management of waste and rehabilitation of exploited sites. Where such operations threaten species, site or conservation values identified, negotiation or legal action may be effective ways to challenge the company. Support of local communities and decision-makers is likely to be key to success, and CEPF will support such actions in priority cases where there is local support (or support can be built) for action. CEPF grants could support data gathering, and linking local stakeholders with legal and technical advisors with relevant experience.

Strategic Direction 6: Enhance civil society capacity for effective conservation action in Wallacea

Chapter 7 noted that civil society organizations consulted during this ccosystem profile process reported that they need strengthened management, fundraising and leadership, and also noted that they often lack the knowledge and experience to tackle some of the most important threats to the conservation values of the region. Furthermore, it was identified that many CSOs working on issues indirectly related to environment — such community empowerment and peace-building — have difficulty articulating the link between their work and environmental issues. Creating sustained improvements in civil society capacity for conservation is an important aim of CEPF, alongside direct conservation impacts. CEPF will support capacity-building and accompaniment to help ensure that local civil society organizations can make effective use of grants, and that their actions have a sustainable impact.

Investment Priority 6.1: Enhance the capacity of civil society to identify, plan and undertake surveys, planning, implementation and monitoring of conservation actions.

A specific problem repeatedly highlighted by CSOs and their donors is the lack of the former's capacity to assess the state of an environment, unsustainable exploitation, and the status of key species and habitats. In the absence of this information, they find it difficult to ensure that their work is focused and effective. CEPF will support training in simple techniques for assessment of key species and environmental variables and planning conservation interventions.

Chapter 7 noted that there are relatively few CSOs working specifically for conservation in Wallacea, but that CSOs with skills such as community empowerment, agriculture and small-business development are likely to be important for the success of conservation activities. CEPF grantees are thus likely to be organizations working on livelihoods, rights or other social issues, which are aware in a general way of the importance of natural resources and ecological services but lack the knowledge to define these links clearly or to address environmental issues in their programs. CEPF will fund capacity-building activities that assist CSOs in understanding the conservation outcomes and enable them to link their work to biodiversity conservation. Priority for this kind of support will be CSOs with a clear commitment to work at a priority site.

Investment Priority 6.2: Catalyze networking and collaboration among community groups, NGOs, the private sector and other elements of civil society.

Several of the investment priorities, especially those on influencing policy and behavior, have highlighted the need to build constituencies for conservation action. Inevitably subsectors within the CSO community (e.g., NGOs, communities, religious organizations and businesses) tend to be better at networking within their own subsector than with others, and many opportunities for alliances and collaborative working may be missed as a result. CEPF will support networking directly and also through providing mechanisms to communicate initiatives, results and problems between, for example, different CSO stakeholders around a KBA. Linking local CSOs to national and international networks will enhance access to sources of information and funding, and thus improve the sustainability of actions.

Investment Priority 6.3: Increase the volume of sustainable funding available to civil society for conservation actions via capacity building and appropriate mechanisms.

Access to funding is a key constraint for many CSOs in Wallacea. Some smaller CSOs become active only when funding is available, and are unable to undertake long-term financial planning. Others "follow the money," adopting new agendas in response to donor priorities and funding. Neither situation supports the development of a knowledgeable, effective CSO community that can take action in support of conservation outcomes. CEPF will support civil society by training them to be better fund-raisers and financial managers.

CEPF will also support locally appropriate, viable, and innovative mechanisms to increase the broader pool of funding available to civil society. Often, donors assume this to include creation of a permanent endowment supporting grants like those given by CEPF, and while creation of such a fund might for Wallacea be a possibility at some point, it is not a target within the five year period of this Profile. Rather, CEPF may support preliminary actions that lead to the later creation of a fund. Equally likely, and more perhaps fruitful, CEPF will promote engagement of existing endowments addressing Indonesian biodiversity nationwide, encouraging those to provide greater focus to work in Wallacea.

Recognizing that this strategic direction is about building CSO capacity, with fundraising and funding pools as a means to that end, CEPF will also support CSO management of conservation enterprises, pay-for-performance links between the private sector and CSOs for conservation activities, the creation of pooled funding via associations and networks, and other innovations that generate more or sustainable funding for civil society. This could also include exploration of mechanisms enabling civil society to access public sector or donor funds.

Strategic Direction 7: 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) located in or close to Wallacea. The RIT will promote and administer the grant-making 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 7.1: Operationalize and coordinate CEPF's grant-making processes and procedures to ensure effective implementation of the investment strategy throughout the hotspot.

Guided by the identification of priority sites and species within this ecosystem profile, the RIT will promote the opportunity for applying for grants by issuing requests for proposals tailored to specific issues and geographies. Through provision of appropriate materials and training, the RIT will ensure that local CSOs are not denied the opportunity to participate because of language difficulties or an inability to articulate project ideas in a formal proposal or difficulties in accessing the Internet. The RIT will also ensure that applicants, grantees and other stakeholders are kept informed of decisions on grants, new opportunities to apply as they arise, and the overall progress of the CEPF program. The RIT will develop, as needed, formal collaborative arrangements with government departments, universities and other organizations that have responsibilities or resources important to the overall implementation of the program. Coordination with other grant-making organizations (most obviously the GEF small-grant program in Indonesia and Timor-Leste) may also create opportunities for joint grant making or capacity building.

Investment Priority 7.2: Build a broad constituency of civil society groups working across institutional and political boundaries toward achieving the shared conservation goals described in the ecosystem profile.

The conservation outcomes identified in the ecosystem profile are aligned with conservation priority setting by governments and NGOs in the region. The RIT will promote the conservation outcomes as an agenda for conservation in Wallacea, including synergies with other initiatives within the region and with national and international stakeholders. The RIT may either serve as the lead entity for conservation in Wallacea, or may identify and promote others to take this role.

Investment Priority 7.3: Engage governments and the private sector to mainstream biodiversity into policies and business practices.

The RIT or other appropriate entities will support civil society to engage with government and the private sector and adopt their results, recommendations, and best practice models. This includes engaging directly with private sector partners and

ensuring their participation in implementation of key strategies. It also includes facilitating the creation or strengthening of conservation-oriented networks.

Action to improve regulation, policies and programs for specific species (Investment Priority 1.2) and sites (Investment Priorities 2.5 and 2.6) and for sustainable community-based natural resource management (Investment Priorities 3.5 and 4.3) has been covered in the preceding strategic directions. In addition to these site-, species- and locality-specific actions, CEPF and the RIT will seek opportunities to promote conservation outcomes as an agenda for conservation in Wallacea at national and international levels. Likely entry points with government include national biodiversity strategy and action plans, country reports and interventions to the CBD, CITES, the Bonn Convention (CMS), and the UNFCCC, sectoral species and site action plans. Engagement with major conservation organizations and international agencies working in the hotspot should aim to mainstream conservation outcomes into their strategies and programs. International groups and agencies managing global datasets on conservation, such as IUCN, WCMC, and the CBD secretariat, also need to be kept informed of changes and improvements in the definition of conservation outcomes. Finally, national and international networks of private sector companies, certification authorities, and industries (e.g., the U.S. Consumer Goods Forum, the RSPO, FSC or the Equator Initiative).

Investment Priority 7.4: Monitor the status of biogeographic and sectoral priorities in relation to the long-term sustainability of conservation in the hotspot.

In parallel with the collection of additional data for specific conservation objectives by grantees (Investment Priorities 1.1, 2.4), the RIT or other appropriate entities will monitor the overall status of KBAs and corridors to assess the impacts of the program provide information for conservation planning. Monitoring of land use change using satellite images is increasingly near-real-time and efficient (e.g.. with the Global Forest Watch II/World Resources Institute system). However, for impact on decision-making, it is also important to use officially recognized data sources, such as the Ministry of Forestry land-use-change mapping and the Geospatial Information Agency data in Indonesia. No standard land-cover mapping is available for Timor-Leste, but the Ministry of Agriculture has detailed recent mapping from a Japanese-funded project that is a reference for government and could form a baseline for monitoring.

Monitoring of this information, plus information on civil society, sustainable financing, the enabling environment, and responsiveness to emerging issues, will help CEPF report on the overall health of the hotspot and the need for continued donor engagement in the region.

Investment Priority 7.5: Implement a system for communication and disseminating information on conservation of biodiversity in the hotspot.

The RIT or other appropriate entities will create a mechanism for the dissemination of monitoring results into government agencies and NGO networks. This should be aligned

with official land-use-change monitoring, such as the MRV system that the newly created Indonesian REDD+ agency will develop.

Despite the lack of data noted above, there is a great deal of interest in Wallacea nationally and internationally, from taxonomists, evolutionary biologists, hobbyists and others. A number of different groups, websites and forums exist to share information within these groups, but most of this data has not yet been compiled and used effectively for conservation planning. This ecosystem profile is a first attempt to do this, and CEPF may establish a mechanism, based in a suitable institution, to collate information and make it available in a form that is accessible and useful for stakeholders involved in conservation in the region.

12.12 Linking Strategic Direction and Priority Geographies for CEPF Support

This section provides further guidance on the relevance of the different strategic directions in the each of the priority cluster identified above.

SangiheTalaud islands and marine corridor (North Sulawesi):

- SD1 (species): the red-and-blue Lory Eos histrio is severely threatened by trade.
- SD2 (sites): no national park. The Karakelang Faunal Reserve has a management unit with limited capacity. The critical threatened species on Mt Sahendaruman are in the watershed protection forest.
- SD3+4 (community-based approaches): highly relevant; high level of awareness and pride in the endemic species can be capitalized on for conservation action.
- SD5 (private sector): no significant players known.
- SD6 (capacity-building): small number of CSOs on the islands; may be of interest to CSOs in North Sulawesi.
- SD7 (RIT): candidate for implementation of the first tranche of funding; cluster could quickly produce and implement conservation actions and is a very high priority.

Lake Poso (Central Sulawesi):

- SD1 (species): trade in endemic fish not known to be an issue.
- SD2 (sites): no protected area, requires a landscape approach addressing issues in the surrounding watersheds.
- SD3+4 (community-based approaches): relevance unknown.
- SD5 (private sector): may be local water companies.
- SD6 (capacity-building): CSO situation is not known; may be some interest from CSOs in Makassar, Palu.
- SD7 (RIT): further scoping required to identify issues and potential grantees more clearly before launching an RFP for this cluster.

Malili Lakes (South and Central Sulawesi Province):

- SD1 (species): trade in endemic shrimps not known to be an issue, but needs confirmation.
- SD2 (sites): Some of the site is a nature tourism area; the rest is unprotected; requires integrated watershed-based approach to conservation.
- SD3+4 (community-based approaches): relevance unknown.
- SD5 (private sector): large nickel mine (PT Vale Indonesia) is potential supporter of conservation.
- SD6 (capacity-building): CSO situation is not known; may be of some interest from CSOs in Makassar, Palu.
- SD7 (RIT): further scoping requires to identify issues and potential grantees more clearly before launching an RFP for this cluster.

Southern Sulawesi (South Sulawesi province):

- SD1 (species): trade in endemic butterflies may be a threat at Bantimurung.
- SD2 (sites): one national park. Potential to upgrade status of remaining mountain forests on basis of their importance for water and recreation.
- SD3+4 (community-based approaches): cacao farmers are well integrated with global markets. Economic approaches to conservation are more likely to be relevant than cultural ones. Tere may be considerable potential for PES schemes.
- SD5 (private sector): high potential for collaboration and sponsorship: large cement quarry beside Bantimurung (Bosowa), coffee and cacao industry, including international companies, regional center of banking.
- SD6 (capacity-building): wide range of CSOs in Makassar, university.
- SD7 (RIT): many potential grantees, but conservation planning at sites and potential for private sector sponsorship might be explored before issuing an RFP for this cluster.

Togean-Banggai Marine Corridor (Central Sulawesi):

- SD1 (species): exploitation of the endemic cardinal fish for the pet trade may still be an issue.
- SD2 (sites): one national park; potential for MPAs in other areas
- SD3+4 (community-based approaches): highly relevant, with local communities highly dependent on marine resources.
- SD5 (Private sector): few companies, although recent gas drilling development based around Luwuk may offer potential for partnerships.
- SD6 (capacity building): limited CSO community.
- SD7 (RIT): further definition of priorities and potential grantees required.

Halmahera and Halmahera Marine Corridor (North Maluku):

- SD1 (species): important; trade in white cockatoo, chattering lory, pitcher plants, birdwing butterflies, eggs of scrubfowl are all issues. One of three major karst areas in Wallacea requires further work on cave species.
- SD2 (sites): One national park (two KBAs), already has a multistakeholder forum; large watershed protection forest on Morotai; important corridors of forest are in mining and logging concessions.
- SD3+4 (community-based approaches): some areas with strong cultural identity, AMAN strong on North Halmahera, but the strength of the link between culture and resource management not clear.
- SD5 (private sector): Eramet-owned Weda Bay Minerals interested in biodiversity offsets; many smaller mining companies, some tourism/diving companies.
- SD6 (capacity-building): some NGOs in Ternate and North Halmahera; further scoping to identify potential grantees in the region.
- SD7 (RIT): further scoping required before launching an RFP.

Seram and the Buru Marine Corridor (Maluku):

- SD1 (species): trade in Moluccan cockatoo is a problem.
- SD2 (sites): one national park, large areas of forest remain outside protected areas.
- SD3+4 (community-based approaches): highly relevant, SASI is reported to play a central role in terrestrial and marine resource management for local communities.
- SD5 (private sector): few players; may be opportunities to collaborate with logging companies on concession management.
- SD6 (capacity-building): active NGO community in Ambon, university, LIPI research station, with active research on Seram.
- SD7 (RIT): this area could probably respond quickly to an RFP.

Flores and the SolorAlor Marine Corridor (East Nusa Tenggara):

- SD1 (species): Exploitation of yellow-crested cockatoo an issue in some areas where the species survives.
- SD2 (sites): three national parks, but also important watershed protection forests. Highly seasonal climate makes water an issue and a good entry point for landscape-based management.
- SD3+4 (community-based approaches): highly relevant, with strong systems of tenure and resource management important; community tourism has already started to be developed as a spin-off from Komodo tourism.
- SD5 (private sector): no large companies, but tourism, water and some agribusiness such as coffee and cacao maybe potential partners given the sensitivity of water and forest issues.

- SD6 (capacity-building): good number of local NGOs, capacity generally low; one university.
- SD7 (RIT): this area could probably respond quickly to an RFP.

Timor-Leste and the TimorLeste Marine Corridor:

- SD1 (species): exploitation especially an issue for snake-necked turtle but also for yellow-crested cockatoo, pigeons and Timor deer.
- SD2 (sites): one national park with limited resources already has community involvement in management planning; new law may soon establish up to 50 protected forests, mainly on mountains; opportunity for integrating community and forest management institutions.
- SD3+4 (community-based approaches): highly relevant, with strong systems of tenure and resource management important.
- SD5 (private sector): few large companies except for those involved in oil exploitation; tourism, water and some agribusiness such as coffee may be potential partners given the sensitivity of water and forest issues.
- SD6 (capacity-building): active community of NGOs in Dili, some in the regions; capacity generally low; three universities.
- SD7 (RIT): this area could probably respond quickly to an RFP.

13. SUSTAINABILITY

Ultimately, CEPF's contribution to more secure biodiversity, enhanced livelihoods and increased CSO capacity in Wallacea will not be judged on the basis of grants disbursed and projects implemented, even though these are essential steps. It will be judged on the basis of its sustained impact on the decisions and actions of stakeholders in the hotspot. Decisions and actions change because of greater knowledge and awareness, access to alternatives and resources, and improved formal and informal rules on how things are done. Sustainability of the impact of CEPF programming in Wallacea will depend, therefore, 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.

The ways in which the seven strategic directions and 34 investment priorities have been designed to address these three points is described briefly here.

13.1 Capacity Building for Sustainability

The need for capacity building was emphasized repeatedly by participants in stakeholder workshops and by the national advisory committees in Indonesia and Timor-Leste. Chapter 7 outlines the results of an initial analysis of capacity gaps and presents some ideas on how they can be addressed. Strategic Direction 6 addresses this issue directly via building for organizational strengthening and knowledge and skills to plan and implement conservation related projects (IP6.). It also addresses strengthening of networking within and between different groups in civil society (IP6.2).

Capacity-building is not only focused on individual organizations; it includes facilitating constructive collaboration between government, private sector and civil society actors. Capacity-building aims to enable each institution to overcome or work around its internal constraints and develop win-win collaborations with other stakeholders. Examples include protected area management authorities and communities collaborating to monitor and protect marine or forest resources, and private companies developing land-use plans in collaboration with local resource users to avoid conflict. SD 2 addresses these issues.

A critical element of capacity that is often excluded from conventional capacity-building programs is security and recognition of use and ownership rights over resources. Whether applied to private sector or communities, secure rights enable a stakeholder to engage with others from a position of certainty. As a result, negotiated agreements on access, benefit sharing or resource use are more likely to be respected by all parties and to be enforceable, in necessary, by law. Conversely, insecure and unclear rights cause conflict

and short-term "grab what you can while you can" approaches to resource management. Chapters 5 and 6 described the fragile nature of community rights in Wallacea, but private sector rights can also be susceptible to political changes and difficult to protect in law. IP3.1 and IP4.1 address these issues.

Increasing the capacity of CSOs in Wallacea to plan and address conservation priorities presupposes that the knowledge needed is available; however, as was noted in Chapter 4, there are significant gaps in basic information on the distribution and populations of species and habitats, as well as on the social and ecological factors that influence them. These hinder the development of conservation programs and monitoring of their effectiveness. Several different investment priorities across the strategic directions address this issue.

13.2 Sustainable Resourcing for Conservation

Mobilizing greater, sustained resources for conservation in Wallacea has several elements, addressed by investment priorities under different strategic directions. There is no dedicated funding mechanism for conservation in Wallacea, and those which operate country-wide in Indonesia (for example, the GEF small-grants fund and the grants programs of the Samdhana Institute and Yayasan Kehati) do not provide enough funding to make more than a local difference. IP6.3 is intended to allow the regional implementation team (RIT) and grantees to explore the opportunities for establishing a dedicated mechanism.

Another facet of resource mobilization for conservation is influencing the funding available from other institutions. Chapter 10 demonstrated that there are significant funds from central government for management of some protected areas, and also that some private sector actors have significant CSR funds available. In addition, local government agencies often have budgets for activities that can be accessed by local groups and aligned with conservation priorities. Influencing the spending of these funds, to more effectively address global conservation priorities in the hotspot requires working with the relevant stakeholders to demonstrate better models for implementation and to help identify and overcome obstacles to more efficient use of funds. SD5 address this issue with private sector actors, IP2.1 with protected area managers and IP4.3 with local governments.

Finally, mobilizing resources for conservation includes redirecting them away from destructive activities. For some stakeholders, this is a capacity issue, and they will shift their resources to more sustainable activities once provided with information and skills needed to enable them to do so. IP1.3 address this for species conservation and IP5.3 for the mining industry. At a local level, the introduction of appropriate changes to agricultural systems can generate additional resources, contribute to livelihoods improvements and reduce pressure on natural resources, although assumptions about the direct link between intensification of agriculture and reduced pressure on natural habitats have often proved simplistic (for example, when improved market prices for coffee lead to the expansion of planting at the expense of forest). Hence, the emphasis in IP3.2 on

developing new or better markets for sustainably produced local products and the reference to services, which could include nonexploitative ones, such as watershed protection, carbon sequestration or tourism.

While positive models and demonstrations can be effective, these tend to be adopted by actors who are already more progressive and open to change. Laggards within industry, government and communities — stakeholders who continue destructive activities against the common interest and often against the law — can be influenced by regulations (see below), but also by pressure from financiers and buyers. Market-led campaigns have achieved important commitments in the oil palm and pulp-paper sectors in Indonesia, and IP5.3 is intended to allow grantees to link local issues in Wallacea with these national and global campaigns. Mining has largely escaped the focus of these campaigns to date, and it would be appropriate to encourage closer scrutiny of the operations and markets of mining companies threatening conservation values in Wallacea.

13.3 Sustaining Change Through Norms and Regulations

Scaling-up and sustaining local successes requires institutionalization through development of rules, norms and mechanisms for decision-making that take into account the sustainable management of resources. Conventional wisdom is that this should happen at the lowest — most local — level possible to allow rules to be tailored to local conditions and to be accountable to the stakeholders most affected by the regulations. This aligns with processes of regulatory and budgetary decentralization underway in Indonesia and Timor-Leste. Nevertheless, the role of national and regional governments in setting direction, standards and limits for local regulations is crucial, and all levels need to be influenced. Outside formal regulation, community resource management decisions in much of Wallacea are influenced by cultural norms and traditions, overseen by local leaders and associated with rituals from which they derive legitimacy. Examples include *sasi* in Maluku and *tara bandu* in Timor-Leste.

Influencing the development of formal and informal rules and decisions is an art that requires good understanding of how decisions are made and who holds power within the relevant institutions. In most cases, it involves the presentation of data and making the case for change, or engaging the stakeholders themselves in an analysis of the problem and possible solutions. IP1.2, IP2.4 and SD6 are intended to support these types of activities. It may also be necessary to provide capacity to formulate regulations, or to arrange sharing of experiences and examples from other areas (IP3.3 and IP4.4).

Finally, changes to rules and regulations need to be communicated and implemented, which leads back to questions of awareness and capacity. Several investment priorities address this issue.

14. CONCLUSION

The great strength of a small-grants program is that it can deliver appropriate levels of funding, rapidly and with a minimum of bureaucracy, to local CSO groups that are rooted in local context and know how to make a difference on the ground. The risk is that these grants are only "drops in a bucket" that create local ripples but do not, in the end, achieve sustained change. The challenge for the RIT is to combine strategic grant-making and capacity-building to take advantage of opportunities to make a difference on the ground, and then use those success stories to influence change on a wider scale.

WALLACEA LOGICAL FRAMEWORK: 2014-2019

Note: GI* refers to the relevant global indicators in the CEPF Global Monitoring Framework

Objective	Indicators	Means of Verification	Important Assumptions
Status of globally threatened biodiversity in Wallacea is more secure as a result of action by civil society organizations	Increase in the RLI over five years for all globally threatened species in the hotspot (GI1)	Baseline RLI 2014, and re-evaluation of the RLI by WCMC in 2019 (target increase to set by RIT)	Status of RL species adequately represents the conservation status of wild biodiversity in the hotspot overall
	Reduction in level of threat to target KBAs (GI6)	Assessment of scale, impact and immediacy of threats to priority KBAs in 2014, 2017, 2019	Background level of threat is stable or increasing, so that a reduction is indicative of program success
	300% increase in the area of production landscapes (non-PA) managed for biodiversity between 2014 and 2019 (GI8)	Area of production landscape under conservation managed determined from: • Reports from CEPF grantees • Reports from certification and licensing bodies • Reports from license holders	Production landscapes were already existing and are not replacing natural habitats with greater biodiversity value (i.e., there is a net gain for biodiversity)
	Change in the number of people (GI9) and communities (GI10) with improved and more secure livelihoods as a result of CEPF grantee actions	Baseline 2014 = 0 Grantee reports and independent evaluation results	Improved and more secure livelihoods result in reduced unsustainable pressure on resources and are not off-set by population increase
	Estimated volume of above-ground CO_{2e} stored in KBAs supported by CEPF grants is stable or increases (GI11)	Remote-sensing based estimates of above-ground carbon stock (e.g., from Baccini *et al*. 2012[79]), or official land-use cover maps combined with carbon stock estimates	Natural vegetation with biodiversity value is not replaced by crops/land use with a higher carbon stock but lower biodiversity value
	Increase in the volume and quality of freshwater supply from KBAs supported by CEPF grants (GI12)	Baseline = 0 Reports from grantees (methodology to be determined)	

[79] Baccini, A., et al. (2012) Estimated carbon dioxide emissions from tropical deforestation improved by carbon density maps. Nature Climate Change. DOI: 10.10.38/NCLIMATE1354. Datasets available at: http://www.whrc.org/mapping/pantropical/carbon_dataset.html

Objective	Indicators	Means of Verification	Important Assumptions
	The intensity and effectiveness of CSO networking and partnerships increases as a result of the CEPF program (GI22)	Results of assessment of coverage of key issues/threats by networks in 2014 and 2019 Results of assessment of networking effectiveness (questionnaire survey on CSO networking and qualitative results of evaluation of networking activities) in 2014 and 2019	Networking is mission and issue-driven, not just a response to funding opportunities
Intermediate Outcomes	**Intermediate Indicators**	**Means of Verification**	**Important Assumptions**
1. Threats to high priority **species** are reduced $400,000	Main threats to at least five terrestrial and three marine species are reduced to a level where they do not endanger the species Six existing species action plans are resourced and implemented by government	Baseline: 0 List of species identified as priorities for CEPF funding (Table 12.2) Grantee reports and project monitoring Official reports on allocation of budget and action plan implentation for six plans (for species, see Table 4.26)	Drivers of threats to specific species can be addressed within the hotspot countries or through partnerships with others (e.g., for international trade chains)

Objective	Indicators	Means of Verification	Important Assumptions
2. Globally important **sites** are managed to conserve global biodiversity values $1,000,000	Rate of habitat loss in at least one terrestrial KBA supported by CEPF grants in each of eight priority clusters is reduced by 50% compared to a business as usual baseline (GI3) For at least one KBA in each of five priority marine corridors coral cover at the end of the project is no less than the cover at the beginning as a result of CEPF support. At least one successful CEPF funded ridge-to-reef project in each of the four marine corridors that are integrated with terrestrial corridors At least one KBA in each of eight priority clusters **outside official protected areas** is conserved through a successful CEPF funded project	Baseline: forest loss 2000–2011 from remote sensing and MoFor land cover mapping Modelled BAU forest loss based on projection of 2000–2011 rate (based on the surrounding landscape deforestation rate for non-PA KBAs) Measured forest loss 2014–2019 Baseline coral cover assessment at project start and end. End of project evaluations and grantee reports	Populations of priority species at target sites are not below the threshold for a viable population

Objective	Indicators	Means of Verification	Important Assumptions
	Overall level of resources (protected area staff, budget, and resources from other stakeholder) dedicated to addressing priority conservation management issues at five CEPF-funded KBAs that are also protected areas increases by at least 10% within a year of the end of the project (GI18) Annual budget allocation by PHKA and KKP (Indonesia) for conservation in Wallacea increases by 1% per year in real terms. Local government at 10 CEPF-funded marine KBAs allocates resources for their conservation Evaluation of the management effectiveness of terrestrial (METT) and marine (EKKP3K) protected areas in Wallacea shows improvements in at least 50% of the indicators	Baseline: see general information on PA budgets and staffing in chapter 10 Site level baseline to be established by projects Annual spending available from PHKA and KKP Grantee reports and monitoring METT reports from PHKA and EKKP3K from KKP	
	Increase of 10% (from 2.7 million to at least 3 million hectares) in the area of **terrestrial** KBAs under formal protection (GI5) Increase of 50 % in the area of Marine KBAs with formal protection as KKP/KKPD within five priority marine corridors	Baseline: see Chapter 4 Indicator: official decision letters and indicative maps of new protected areas	

Objective	Indicators	Means of Verification	Important Assumptions
3. Indigenous and local natural resource-dependent communities are engaged with integrated management of key sites and corridors $750,000	At all CEPF-funded sites indigenous and resource-dependent communities have documented and mapped customary ownership and/or use rights at the site (GI4)	Baseline: grantee baseline defining relevant communities and baseline level and security of access Copies of documents and maps	The conservation status of a site will be better in the long-term when managed with the involvement of indigenous and local communities given appropriate incentives, institutions, technical support and recognition of rights than it would have been if managed to exclude local resource users
	At all CEPF-funded sites the rights of relevant local communities over natural resources are acknowledged and respected by other stakeholders (GI4)	Baseline: grantee description of extent to which rights to be informed/consulted/make decisions over resource management are formalized in law and respected by government and other stakeholders Grantee reports and documentation of changes in recognition of rights	
	Community institutions, capacity, plans and agreements with other stakeholders (as appropriate for the situation) are in place and resourced (GI4) in at least one KBA in each of three priority clusters	Baseline: grantee report on pre-project situation Grantee reports and documentation of plans, institutions and agreements	
4. Indigenous and local communities dependent on marine resources are engaged with integrated management of key sites and corridors $600,000	Same indicators as Outcome 3	Same verification as Outcome 3	Same as for Outcome 3
	Community systems for management of marine resources are recognised and supported by government in at least three CEPF-funded marine KBAs Conservation management of all CEPF-funded marine KBAs includes creation or strengthening of community groups	Baseline: see Chapter 4 Indicator: official decision letters and indicative maps of new protected areas	
5. Private sector actors take action to mitigate negative impacts and to support	5 Private sector actors with resource management/extraction licenses over KBAs adopt mechanisms to safeguard	Baseline: 0 Grantee baseline assessment of	Technically and economically feasible options exist which allow private sector

Objective	Indicators	Means of Verification	Important Assumptions
conservation of globally important sites and species in production landscapes $1,000,000	global biodiversity values at sites targeted by CEPF grants (GI4)	threats and actions required Documentation of company policies Documentation of company budgets and practice to implement safeguards	operations to proceed while causing no net biodiversity loss
	Private sector actors (in or out of the NR sector) provide funding to address priority conservation actions at 10 KBAs targeted by CEPF grants in production landscapes	Baseline: 0 Grantee/RIT analysis of private sector stakeholders interested in supporting conservation Documentation of company commitments and payments	
	At least three models of best practice addressing key issues in production landscapes are documented and disseminated (GI19)	Baseline: 0 Identification of priorities and candidates for best practice models by the RIT Documentation of best practice examples	
6. Civil society in Wallacea has the capacity to identify, implement and sustain actions for maintenance of global conservation values $750,000	Increase in the capacity of 75% CEPF grantees to plan, implement and sustain conservation actions (GI20)	Baseline: grantee self-assessment on grant award including capacity building needs Grantee self-assessment at end of project Documentation and evaluation of specific capacity-building events	Civil society will continue to see biodiversity conservation as a valid goal to contribute to
	Improvement in the collective ability of civil society in Wallacea to plan, implement and sustain conservation actions (GI21) in at least three of the eight priority clusters, compared to baseline established by the RIT	Baseline: see Chapter 7 for general information RIT lead cluster-specific analysis of CSO strengths, complementarity and networking	

Objective	Indicators	Means of Verification	Important Assumptions
		End of program evaluation	
	Leaders of 75% CEPF grantees demonstrate knowledge of global and national issues and decisions which affect their work and plans, and articulate how they will respond , in the initial assessment and end of project assessment (GI23)	Baseline: survey of level of awareness and response to relevant issues (based on a list developed by the RIT but open to additions from CSOs) End of program evaluation	
7. Incorporation of CEPF-identified priorities into key stakeholder policies and programs results in more, better targeted funding for conservation in the hotspot, as aaddressed by the RIT or appropriate entities $1,500,000	Six existing species action plans are updated with reference to CEPF data and project results Data from CEPF is used to determine location of new MPAs by KKP and "essential ecosystem" by PHKA Three major national development policies (e.g., MP3EI, NBSAP) take into account conservation of KBAs and corridors Five examples of provincial or district land-use plans, marine/coastal spatial plan, development plans taking into account conservation of KBAs and corridors Plan for resource mobilisation in NBSAP supports KBA conservation Government's "one map" process (reform of forest tenure in Indonesia) recognises the importance of maintaining forest cover in priority sites	Baseline: information in Chapter 6, enhanced with RIT compilation of local government regulations End of program evaluation of new regulations in target local administrations and nationally	Pro-conservation changes in policy and funding will translate into more and more effective pro-conservation actions on the ground

Objective	Indicators	Means of Verification	Important Assumptions
	Draft decree on protected areas in Timor-Leste is passed, resourced and implemented		
	At least five companies or CSOs take conservation of KBAs into account in their planning process	Baseline: Chapter 10, to be updated by the RIT Determination of target private sector and CSO actors End of program evaluation of private sector and CSO policies and programs	
	Assessment of options and potential sources of funding for a sustainable financing mechanism completed (GI14, GI15, GI16, GI17)	Baseline: no sustainable financing mechanism exists for conservation in Wallacea (see Chapter 10) Documentation of feasibility analysis and planning for creation of a mechanism	
Funding Summary	**Amount**		
Total Budget	$6,000,000		

ABBREVIATIONS USED IN THE TEXT

ADB	Asian Development Bank
AusAID	Australian Agency for International Development
AZE	Alliance for Zero Extinction
Balai Tahura	Forest Park
BTN/TN	National Park
Bappenas	National Development Planning Board
Bappeda	Regional Development Planning Board
Bappekot	City Development Planning Board
(B)KSDA	Natural Resources Conservation Agency
BLH(D)	(Regional) Environment Agency
BPDAS	Watershed Management Offices
BPK	Forestry Research Institute
BPK	Supreme Audit Agency
BPS	Central Agency on Statistics
BPTH	Forest Tree Breeding Research Institute
CBC	Center for Biodiversity and Conservation
CBD	Convention on Biological Diversity
CBO	Community-based Organization
CSO	Civil Society Organization
CEPF	Critical Ecosystem Partnership Fund
CI	Conservation International
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CR	Critically Endangered
CSR	Corporate Social Responsibility
CTC	Coral Triangle Center
CTI	Coral Triangle Initiative
Disbudpar	Cultural and Tourism Agency
Dishut	Forestry Agency
Disnak	Husbandry Agency
Distanhut	Plantation and Forestry Agency
DKP	Office for Fisheries and Marine Affairs
EIA	Environmental Impact Assessment
EN	Endangered
ENSO	El Niño/Southern Oscillation
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FSC	Forest Stewardship Council
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas

GNP	Gross National Product
HDI	Human Development Index
HPH	Logging License/IUPHHK-HA
HTI	Tree Plantations License/Hutan Tanaman Industri
IBA	Important Bird Area
IBCSD	Indonesian Business Council for Sustainable Development
INGO	International Nongovernmental Organization
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for the Conservation of Nature
KBA	Key Biodiversity Area
KKP	Ministry of Marine Affairs and Fisheries
KPH	Forest Management Unit
MoU	Memorandum of Understanding
MoEnv	Ministry of Environment
MoF(or)	Ministry of Forestry
MPA	Marine Protected Area
MP3EI	Master Plan for Accelerated Economic Growth
NBSAP	National Biodiversity Strategy and Action Plan
NGO	Nongovernmental Organization
NOAA	National Oceanographic and Atmospheric Administration
PA	Protected Areas
PES	Payment for Ecosystem Services
PHKA	Directorate General of Forest Protection and Nature Conservation
PNG	Papua New Guinea
PO	People Organization
RAN-GRK	National Action Plan to Reduce Greenhouse Gas Emissions
REDD	Reducing Emissions from Deforestation and Forest Degradation
RIT	Regional Implementation Team
RFP	Request for Proposal
RSPO	Roundtable on Sustainable Palm Oil
SEAs	Strategic Environment Assessments
TNC	The Nature Conservancy
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNTAET	United Nations Transitional Administration in East Timor
USAID	United States Agency for International Development
VU	Vulnerable
WCS	Wildlife Conservation Society
WWF	World Wide Fund for Nature

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APPENDICES

Appendix 1. List of Trigger Species

Group and Species Code	Scientific Name	Common Name	Red List Category	Single Site Endemic	Wallacea Endemic?	Num of KBA Confirmed Presence	Adjusted Number KBAs
Bird							
968	*Aceros cassidix*	Knobbed hornbill	VU	No	Yes	30	11-100
971	*Aceros everetti*	Sumba hornbill	VU	No	Yes	11	11-100
8334	*Aethopyga duyvenbodei*	Elegant sunbird	EN	No	Yes	3	3
31610	*Amaurornis magnirostris*	Talaud bush-hen	VU	No	Yes	2	2
2880	*Aramidopsis plateni*	Snoring rail	VU	No	Yes	9	9
1402	*Cacatua alba*	White cockatoo	VU	No	Yes	14	11-100
1401	*Cacatua moluccensis*	Salmon-crested cockatoo	VU	No	Yes	6	6
1398	*Cacatua sulphurea*	Yellow-crested cockatoo	CR	No	Yes	88	11-100
3040	*Calidris tenuirostris*	Great knot	VU	No	No**	2	11-100
1375	*Charmosyna toxopei*	Blue-front lorikeet	CR	Yes	Yes	2	2
9816	*Colluricincla sanghirensis*	Sangihe shrike-thrush	CR	Yes	Yes	1	1
5765	*Corvus florensis*	Flores crow	EN	No	Yes	10	10
5764	*Corvus unicolor*	Banggai crow	CR	No	Yes	1	<10
6553	*Cyornis sanfordi*	Matinan flycather	EN	No	Yes	4	4
2742	*Ducula cineracea*	Timor imperial pigeon	EN	No	Yes	8	8
2727	*Ducula pickeringii*	Grey imperial pigeon	VU	No	No*	3	11-100
3712	*Egretta eulophotes*	Chinese egret	VU	No	No	3	>100
1339	*Eos histrio*	Red-and-blue lory	EN	No	Yes	5	5
127	*Eulipoa wallacei*	Molucan Megapode	VU	No	Yes	20	11-100
2357	*Eurostopodus diabolicus*	Sulawesi eared-nightjar	VU	No	Yes	6	6
6062	*Eutrichomyias rowleyi*	Caerulean Paradise-flycatcher	CR	No	Yes	2	3
2924	*Ficedula bonthaina*	Lompobatang flycather	EN	No	Yes	3	3
3847	*Fregata andrewsi*	Christmas Island frigatebird	CR	No	No**	2	11-100
2623	*Gallicolumba hoedtii*	Wetar ground-dove	EN	No	Yes	8	8
3746	*Gorsachius goisagi*	Japanese night-heron	EN	No	No+	3	>100
2890	*Gymnocrex rosenbergii*	Blue-faced rail	VU	No	Yes	9	9

Group and Species Code	Scientific Name	Common Name	Red List Category	Single Site Endemic	Wallacea Endemic?	Num of KBA Confirmed Presence	Adjusted Number KBAs
30064	*Gymnocrex talaudensis*	Talaud rail	EN	No	Yes	2	2
2924	*Habroptila wallacii*	Invisble rail	VU	No	Yes	2	3
3840	*Leptoptilos javanicus*	Lesser adjutant	VU	No	No+	1	>100
1526	*Loriculus flosculus*	Flores hanging-parrot	EN	No	Yes	8	8
1358	*Lorius domicella*	Purple-naped lory	EN	No	Yes	6	6
1357	*Lorius garrulus*	Chattering lory	VU	No	Yes	17	11-100
116	*Macrocephalon maleo*	Maleo	EN	No	Yes	27	11-100
7517	*Madanga ruficollis*	Rufous-throated white-eye	EN	No	Yes	2	2
119	*Megapodius bernsteinii*	Sula scrubfowl	VU	No	Yes	8	10
6107	*Monarcha boanensis*	Black-chinned monarch	CR	Yes	Yes	1	1
6105	*Monarcha everetti*	White-tiped monarch	EN	Yes	Yes	1	1
6104	*Monarcha sacerdotum*	Flores monarch	EN	No	Yes	3	3
3825	*Mycteria cinerea*	Milky stork	VU	No	No+	11	>100
30063	*Ninox ios*	Cinnabar hawk-owl	VU	No	Yes	4	4
31547	*Nisaetus floris*	Flores hawk-eagle	CR	No	Yes	14	11-100
3014	*Numenius madagasacariensis*	Far Eastern curlew	VU	No	No**	2	11-100
9772	*Otus alfredi*	Flores scops-owl	EN	No	Yes	4	4
30061	*Otus siaoensis*	Siau scops-owl	CR	Yes	Yes	1	1
8734	*Padda oryzivora*	Java sparrow	VU	No	No+	5	11-100
3651	*Papasula abbotti*	Abbott's booby	EN	No	No+	3	>100
962	*Penelopides exarhatus*	Sulawesi hornbill	VU	No	Yes	20	11-100
5319	*Philemon fuscicapillus*	Dusky friarbird	VU	No	Yes	4	4
2656	*Ptilinopus dohertyi*	Red-naped fruit-dove	VU	No	Yes	10	10
2696	*Ptilinopus granulifrons*	Carunculated fruit-dove	VU	No	Yes	2	2
2982	*Scolopax rochussenii*	Moluccan woodcock	EN	No	Yes	3	3
3264	*Sterna bernsteini*	Chinese crested-tern	CR	No	No**	1	11-100
6821	*Sturnus melanopterus*	Black-winged starling	CR	No	No+	1	11-100
1445	*Tanygnathus gramineus*	Black-lored parrot	VU	No	Yes	4	4
1122	*Todiramphus funebris*	Sombre kingfisher	VU	No	Yes	9	9
2638	*Treron floris*	Flores green-pigeon	VU	No	Yes	19	11-100
2640	*Treron psittaceus*	Timor green-pigeon	EN	No	Yes	6	6
517	*Turnix everetti*	Sumba buttonquail	VU	No	Yes	3	4

Group and Species Code	Scientific Name	Common Name	Red List Category	Single Site Endemic	Wallacea Endemic?	Num of KBA Confirmed Presence	Adjusted Number KBAs
2146	*Tyto inexspectata*	Sulawesi golden-owl	VU	No	Yes	7	7
2147	*Tyto nigrobrunnea*	Taliabu masked-owl	EN	Yes	Yes	1	1
30062	*Zosterops nehrkorni*	Sangihe white-eye	CR	Yes	Yes	1	1
Terrestrial Mammal							
60247	*Acerodon humilis*	Talaud acerodon	EN	No	Yes	3	3
61791	*Acerodon mackloti*	Lesser Sunda flying-fox	VU	No	Yes	15	11-100
109345	*Ailurops melanotis*	Talaud Bear cuscus	CR	No	Yes	2	2
62727	*Ailurops ursinus*	Bear cuscus	VU	No	Yes	27	11-100
61079	*Babyrousa babyrussa*	Babirusa	VU	No	Yes	2	2
109512	*Babyrousa celebensis*	Sulawesi babirusa	VU	No	Yes	16	11-100
109527	*Babyrousa togeanensis*	Togian Islands babirusa	EN	No	Yes	1	<10
60943	*Bubalus depressicornis*	Lowland anoa	EN	No	Yes	22	11-100
60945	*Bubalus quarlesi*	Mountain anoa	EN	No	Yes	13	11-100
63340	*Bunomys coelestis*	Lompobattang bunomys	CR	Yes	Yes	1	1
63341	*Bunomys fratrorum*	Fraternal hill rat	VU	No	Yes	5	5
63344	*Bunomys prolatus*	Tambusisi bunomys	EN	No	Yes	3	3
108800	*Echiothrix centrosa*	Central Sulawesi echiotrix	VU	No	Yes	5	5
63904	*Echiothrix leucura*	Northern Sulawesi echiothrix	EN	No	Yes	4	4
63931	*Eropeplus canus*	Sulawesi Soft-furred rat	VU	No	Yes	4	4
64015	*Haeromys minahassae*	Lowland Sulawesi haeromys	VU	No	Yes	7	7
109198	*Harpyionycteris celebensis*	Sulawesi Harpy fruit-bat	VU	No	Yes	11	11-100
65147	*Hyosciurus ileile*	Lowland long-nosed squirrel	VU	No	Yes	5	5
61405	*Kerivoula flora*	Flores woolly bat	VU	No	No	10	11-100
64043	*Komodomys rintjanus*	Komodo rat	VU	No	Yes	2	2
63079	*Macaca hecki*	Heck's macaque	VU	No	Yes	9	9
63081	*Macaca maura*	Moor macaque	EN	No	Yes	3	4
63084	*Macaca nigra*	Celebes crested macaque	CR	No	Yes	8	9
63085	*Macaca nigrescens*	Gorontalo macaque	VU	No	Yes	2	4
63086	*Macaca ochreata*	Booted macaque	VU	No	Yes	7	7
61841	*Macaca tonkeana*	Tonkean black Mmacaque	VU	No	Yes	10	10
61381	*Macrogalidia musschenbroekii*	Sulawesi palm civet	VU	No	Yes	11	11-100

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62906	*Manis javanica*	Sunda Pangolin	EN	No	No+	2	>100
64112	*Margaretamys beccarii*	Spiny Lowland margarettamys	VU	No	Yes	7	7
64138	*Maxomys wattsi*	Watt's Sulawesi maxomys	EN	No	Yes	2	2
61952	*Megaerops kusnotoi*	Javan Tailles fruit bat	VU	No	No	2	11-100
64151	*Melomys aerosus*	Dusky melomys	EN	Yes	Yes	1	1
109633	*Melomys bannisteri*	Bannister's rat	EN	Yes	Yes	1	1
109723	*Melomys caurinus*	Short-tailed Talaud melomys	EN	No	Yes	2	2
64157	*Melomys fraterculus*	Manusela melomys	CR	Yes	Yes	1	1
109408	*Melomys talaudium*	Long-tailed Talaud melomys	EN	No	Yes	1	2
61966	*Neopteryx frosti*	Small-toothed fruit-bat	EN	No	Yes	3	3
63183	*Nesoromys ceramicus*	Seram rat	EN	Yes	Yes	1	1
57523	*Nycteris javanica*	Javan Slit-faced bat	VU	No	No+	1	11-100
109507	*Nyctimene keasti*	Keast's tube-nosed fruit-bat	VU	No	Yes	9	10
61978	*Nyctimene minutus*	Lesser tube-nosed Bat	VU	No	Yes	3	3
61979	*Nyctimene rabori*	Philippines tube-nosed fruit-bat	EN	No	No	4	11-100
64493	*Paulamys naso*	Flores long-nosed rat	EN	Yes	Yes	1	1
109509	*Phalanger matabiru*	Blue-eyed cuscus	VU	No	Yes	2	2
62020	*Pteropus melanopogon*	Black-bearded flying-fox	EN	No	Yes	10	10
62026	*Pteropus ocularis*	Ceram flying-fox	VU	No	Yes	5	5
61874	*Pteropus temminckii*	Temminck's flying-fox	VU	No	Yes	6	6
64722	*Rattus hainaldi*	Hainal's rat	EN	No	Yes	3	3
64735	*Rattus mollicomulus*	Little soft-furred rat	VU	No	Yes	2	2
64751	*Rattus xanthurus*	Yellow-tailed rat	VU	No	Yes	4	4
62054	*Rhinolophus canuti*	Canoet's horseshoe-bat	VU	No	No+	0	4
62884	*Rhynchomeles prattorum*	Ceram bandicoot	EN	Yes	Yes	1	1
62039	*Rousettus bidens*	Manado fruit-bat	VU	No	Yes	12	11-100
62976	*Rubrisciurus rubriventer*	Red-bellied squirrel	VU	No	Yes	12	11-100
61047	*Rusa timorensis*	Timor deer / Javan rusa	VU	No	No	20	>100
60296	*Strigocuscus celebensis*	Small Sulawesi cuscus	VU	No	Yes	18	11-100
65313	*Suncus mertensi*	Flores shrew	EN	Yes	Yes	1	1
62051	*Syconycteris carolinae*	Halmahera blossom-bat	VU	No	Yes	5	5
63410	*Tarsius dentatus*	Diana tarsier, Dian’s tarsier	VU	No	Yes	4	4
63411	*Tarsius pelengensis*	Peleng Island tarsier	EN	No	Yes	1	2

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63413	*Tarsius sangirensis*	Sangihe Island tarsier	EN	No	Yes	1	2
63414	*Tarsius tarsier*	Spectral tarsier	VU	No	Yes	19	11-100
1014343	*Tarsius tumpara*	Siau Island tarsier	CR	Yes	Yes	1	1
63205	*Trachypithecus auratus*	Javan langur	VU	No	No+	1	11-100
Marine Mammals							
61499	*Balaenoptera borealis*	Sei whale	EN	No	No	0	140
61501	*Balaenoptera musculus*	Blue whale	EN	No	No	2	9
61502	*Balaenoptera physalus*	Fin whale	EN	No	No	0	140
65385	*Dugong dugon*	Dugong	VU	No	No	31	48
61536	*Physeter macrocephalus*	Sperm whale	VU	No	No	3	140
Amphibian							
58167	*Callulops kopsteini*		EN	Yes	Yes	1	1
58733	*Limnonectes arathooni*	Djikoro wart frog	EN	No	Yes	3	3
58746	*Limnonectes heinrichi*	Heinrich's wart frog	VU	No	Yes	5	10
58755	*Limnonectes microtympanum*		EN	No	Yes	4	5
55904	*Litoria rueppelli*		VU	No	Yes	3	7
57746	*Oreophryne celebensis*	Sulawesi cross frog	VU	No	Yes	3	9
58342	*Oreophryne monticola*	Lombok cross frog	EN	No	Yes	2	2
58351	*Oreophryne variabilis*	Lompobattang cross frog	VU	No	Yes	4	6
Terrestrial Reptile							
66476	*Amyda cartilaginea*	Asiatic softshell turtle	VU	No	No+	3	>100
65659	*Chelodina mccordi*	Snake-necked turtle	CR	No	Yes	3	4
66211	*Cuora amboinensis*	Southeast Asian box Tturtle	VU	No	No	13	>100
1000716	*Gehyra barea*	Banda Island dtella	EN	No	Yes	1	<10
66459	*Indotestudo forstenii*	Sulawesian tortoise	EN	No	Yes	5	5
66238	*Leucocephalon yuwonoi*	Sulawesi forest turtle	CR	No	Yes	5	5
1003082	*Ophiophagus hannah*	King cobra	VU	No	No	14	>100
1002865	*Python bivittatus*	Burmese phyton	VU	No	No	4	>100
1000551	*Typhlops schmutzi*	Flores blind snake	EN	No	Yes	3	3
66175	*Varanus komodoensis*	Komodo dragon	VU	No	Yes	7	7
Marine Reptile							
66263	*Caretta caretta*	Loggerhead seaturtle	EN	No	No	1	140

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66264	*Chelonia mydas*	Green Ssea turtle	EN	No	No	12	140
66271	*Dermochelys coriacea*	Leatherback sea turtle	VU	No	No	1	140
66265	*Eretmochelys imbricata*	Hawksbill sea turtle	CR	No	No	14	140
66267	*Lepidochelys olivacea*	Olive Ridley sea turtle	VU	No	No	1	140
Freshwater Fishes							
52265	*Adrianichthys kruyti*	Duckbilled buntingi	CR	Yes	Yes	1	1
52276	*Dermogenys weberi*		VU	Yes	Yes	1	1
53818	*Glossogobius flavipinnis*		VU	Yes	Yes	1	1
53820	*Glossogobius intermedius*		VU	No	Yes	2	2
53821	*Glossogobius matanensis*		VU	No	Yes	3	3
53839	*Mugilogobius adeia*		VU	Yes	Yes	1	1
53840	*Mugilogobius latifrons*		VU	Yes	Yes	1	1
112362	*Nomorhamphus towoetii*		EN	Yes	Yes	1	1
52266	*Oryzias celebensis*	Celebes medaka	VU	No	Yes	1	2
52267	*Oryzias marmoratus*	Marmorated medaka	VU	No	Yes	2	2
52268	*Oryzias matanensis*	Matano medaka	VU	Yes	Yes	1	1
52269	*Oryzias nigrimas*	Black buntingi	VU	Yes	Yes	1	1
52270	*Oryzias orthognathus*	Sharpjawed buntingi	EN	Yes	Yes	1	1
52271	*Oryzias profundicola*	Yellowfinned medaka	VU	Yes	Yes	1	1
53849	*Pandaka pygmaea*	Dwarf Pygmy goby	CR	No	No	0	11-100
51399	*Paratherina cyanea*		VU	No	Yes	2	2
51400	*Paratherina labiosa*		VU	Yes	Yes	1	1
51401	*Paratherina striata*		VU	No	Yes	2	3
51402	*Paratherina wolterecki*		VU	No	Yes	2	2
53867	*Stupidogobius flavipinnis*		VU	Yes	Yes	1	1
53869	*Tamanka sarasinorum*	Sarasins goby	VU	No	Yes	2	2
52249	*Telmatherina abendanoni*		VU	Yes	Yes	1	1
52250	*Telmatherina antoniae*		VU	Yes	Yes	1	1
52252	*Telmatherina celebensis*		VU	No	Yes	3	3
52253	*Telmatherina ladigesi*	Celebes Rainbow	VU	Yes	Yes	1	1
52254	*Telmatherina obscura*		VU	Yes	Yes	1	1
52255	*Telmatherina opudi*		VU	Yes	Yes	1	1
52256	*Telmatherina prognatha*		VU	Yes	Yes	1	1

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52257	*Telmatherina sarasinorum*		VU	Yes	Yes	1	1
52258	*Telmatherina wahjui*		VU	Yes	Yes	1	1
51409	*Tominanga aurea*		VU	Yes	Yes	1	1
51410	*Tominanga sanguicauda*		VU	Yes	Yes	1	1
52279	*Tondanichthys kottelati*		VU	Yes	Yes	1	1
53870	*Weberogobius amadi*	Poso bungu	CR	Yes	Yes	1	1
52272	*Xenopoecilus oophorus*	Egg-carrying buntingi	EN	Yes	Yes	1	1
52273	*Xenopoecilus poptae*	Popta's buntingi	CR	Yes	Yes	1	1
52274	*Xenopoecilus sarasinorum*	Sarasins minnow	EN	Yes	Yes	1	1
Marine Fish							
60691	*Aetomylaeus nichofii*	Banded eagle ray	VU	No	No	1	140
	Albula glossodonta	Shortjaw bonefish	VU	No	No	0	107
110881	*Alopias pelagicus*	Pelagic thresher shark	VU	No	No	0	140
	Alopias superciliosus	Bigeye thresher shark	VU	No	No	0	140
60605	*Alopias vulpinus*	Common thresher shark	VU	No	No	0	140
60710	*Anoxypristis cuspidata*	Knifetooth sawfish	EN	No	No	0	133
105018	*Bolbometopon muricatum*	Bumphead parrotfish	VU	No	No	12	140
60353	*Carcharhinus hemiodon*	Pondicherry shark	CR	No	No	0	140
60357	*Carcharhinus longimanus*	Oceanic whitetip shark	VU	No	No	0	140
	Carcharhinus obscurus	Dusky shark	VU	No	No	0	140
60362	*Carcharhinus plumbeus*	Sandbar shark	VU	No	No	2	17
111090	*Chaenogaleus macrostoma*	Hooktooth shark	VU	No	No	0	51
53875	*Cheilinus undulatus*	Humphead wrasse	EN	No	No	28	139
53918	*Cromileptes altivelis*	Baramundi cod	VU	No	No	10	140
53933	*Epinephelus lanceolatus*	Brindle bass	VU	No	No	8	140
59087	*Glaucostegus typus*	Common shovelnose ray	VU	No	No	0	140
	Himantura gerrardi	Whitespotted whipray	VU	No	No	0	140
1003002	*Himantura leoparda*	Leopard whipray	VU	No	No	0	129
111078	*Himantura uarnak*	Honeycomb stingray	VU	No	No	0	140
111078	*Himantura undulata*	Bleeker's variegated whipray	VU	No	No	1	140
52892	*Hippocampus barbouri*	Barbour's seahorse	VU	No	No	0	74
52898	*Hippocampus comes*	Tiger tail seahorse	VU	No	No	1	11-100

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	Hippocampus histrix	Spiny seahorse	VU	No	No	0	140
	Hippocampus kelloggi	Great seahorse	VU	No	No	0	126
52910	*Hippocampus kuda*	Common seahorse	VU	No	No	0	140
52916	*Hippocampus spinosissimus*	Hedgehog seahorse	VU	No	No	0	140
52918	*Hippocampus trimaculatus*	Flat-faced seahorse	EN	No	No	0	140
60608	*Isurus oxyrinchus*	Shortfin mako	VU	No	No	0	140
	Isurus paucus	Longfin mako	EN	No	No	0	140
110854	*Lamiopsis temmincki*	Broadfin shark	VU	No	No	0	10
108599	*Latimeria menadoensis*	Coelacanth	VU	No	No	3	3
1007076	*Makaira nigricans*	Blue marlin	VU	No	No	0	133
1002709	*Manta alfredi*	Coastal manta ray	VU	No	No	2	9
1014277	*Manta birostris*	Giant manta ray	VU	No	No	2	138
60621	*Nebrius ferrugineus*	Tawny nurse shark	VU	No	No	2	140
60372	*Negaprion acutidens*	Sharptooth lemon shark	VU	No	No	0	13
1002859	*Nemipterus virgatus*	Golden threadfin bream	VU	No	No	0	133
	Odontaspis ferox	Herbst's nurse shark	VU	No	No	0	52
106555	*Plectropomus areolatus*	Squaretail leopardgrouper	VU	No	No	10	139
106556	*Plectropomus laevis*	Blacksaddled coral grouper	VU	No	No	11	134
	Pristis clavata	Dwarf sawfish	EN	No	No	0	140
60712	*Pristis pristis*	Largetooth sawfish	CR	No	No	0	140
60716	*Pristis zijsron*	Narrowsnout sawfish	VU	No	No	0	140
105019	*Pterapogon kauderni*	Banggai cardinalfish	VU	No	Yes	5	5
60744	*Rhina ancylostoma*	Bowmouth guitarfish	VU	No	No	0	140
60641	*Rhincodon typus*	Whale shark	VU	No	No	9	140
59095	*Rhinoptera javanica*	Flapnose ray	VU	No	No	0	140
59097	*Rhynchobatus australiae*	White-spotted Guitarfish	VU	No	No	0	40
60455	*Sphyrna lewini*	Scalloped hammerhead	EN	No	No	2	140
60457	*Sphyrna mokarran*	Great hammerhead	VU	No	No	0	14
60642	*Stegostoma fasciatum*	Leopard shark, zebra shark	VU	No	No	0	61
60672	*Taeniurops meyeni*	Black-blotched Stingray	VU	No	No	1	8
53912	*Thunnus maccoyii*	Southern bluefin tuna	VU	No	No	0	8
53913	*Thunnus obesus*	Bigeye tuna	VU	No	No	0	88

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Lepidoptera							
51200	*Euploea caespes*	Murphy's crow	EN	No	Yes	0	<10
51202	*Euploea cordelia*	Cordelia's crow	VU	Yes	Yes	1	1
51211	*Euploea magou*	Magou	VU	Yes	Yes	1	1
50768	*Graphium stresemanni*		VU	No	Yes	1	<10
51221	*Idea tambusisiana*	Sulawesi tree nymph	VU	No	Yes	1	<10
51224	*Ideopsis oberthurii*		VU	No	Yes	2	2
50771	*Ornithoptera aesacus*		VU	Yes	Yes	1	1
50774	*Ornithoptera croesus*	Wallace's golden birdwing	EN	No	Yes	9	9
51369	*Papilio jordani*	Jordan's swallowtail	VU	No	Yes	3	3
50317	*Papilio neumoegeni*		VU	No	Yes	1	<10
51228	*Parantica dabrerai*	D'abrera's tiger	VU	No	Yes	1	<10
51234	*Parantica kuekenthali*	Kuekenthal's yellow tiger	EN	No	Yes	1	<10
51239	*Parantica philo*	Sumbawa tiger	VU	No	Yes	0	<10
51245	*Parantica sulewattan*	Bonthain tiger	EN	No	Yes	1	<10
51247	*Parantica timorica*	Timor yellow tiger	EN	No	Yes	0	<10
51249	*Parantica toxopei*	Toxopeus yellow tiger	VU	No	Yes	1	<10
51250	*Parantica wegneri*	Flores tiger	VU	No	Yes	1	<10
50335	*Troides dohertyi*	The talaud black birdwing	VU	No	Yes	3	3
50336	*Troides prattorum*	The buru opalescent birdwing	VU	Yes	Yes	1	1
Odonata							
111911	*Macromia irina*	Lompobattang macromia dragonfly	VU	No	Yes	2	2
111870	*Nososticta phoenissa*	Buru threadtail	VU	No	Yes	2	2
111294	*Paragomphus tachyerges*	Sumba hooktail	VU	Yes	Yes	1	1
111341	*Procordulia lompobatang*	Lompobattang dragonfly	EN	Yes	Yes	1	1
111910	*Protosticta gracilis*	Minahassa damselfly	CR	Yes	Yes	1	1
111313	*Protosticta rozendalorum*	Rozendaal's damselfly	CR	No	Yes	2	2
109977	*Synthemis alecto*	Halmahera tigertail	VU	No	Yes	2	2
Calanoidea (Crustaceans: Copepods)							
50190	*Neodiaptomus lymphatus*		VU	Yes	Yes	1	1
Decapoda (Crustaceans: Crabs And Shrimps Etc)							
	Caridina acutirostris		VU	Yes	Yes	1	1

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	Caridina caerulea	Blue morph shrimp	VU	Yes	Yes	1	1
	Caridina dennerli	Cardinal shrimp	EN	Yes	Yes	1	1
	Caridina ensifera		VU	Yes	Yes	1	1
	Caridina glaubrechti	Red orchid shrimp	EN	Yes	Yes	1	1
	Caridina holthuisi	Matano tiger shrimp	EN	No	Yes	3	3
	Caridina lanceolata		EN	No	Yes	3	3
	Caridina leclerci		VU	Yes	Yes	1	1
	Caridina linduensis		CR	Yes	Yes	1	1
	Caridina lingkonae		EN	Yes	Yes	1	1
	Caridina loehae	Orange delight shrimp	EN	No	Yes	3	3
	Caridina longidigita		VU	Yes	Yes	1	1
	Caridina masapi	Six-banded Blue Bee	EN	No	Yes	3	3
	Caridina parvula		EN	No	Yes	2	2
	Caridina profundicola	Sun-striped Shrimp	EN	Yes	Yes	1	1
	Caridina sarasinorum		VU	Yes	Yes	1	1
	Caridina schenkeli		VU	Yes	Yes	1	1
	Caridina spinata	Red gold flake shrimp	EN	Yes	Yes	1	1
	Caridina spongicola	Celebes beauty	EN	Yes	Yes	1	1
	Caridina striata	Red-lined Shrimp	EN	No	Yes	2	2
	Caridina tenuirostris	White orchid bee	EN	No	Yes	2	2
	Caridina woltereckae	Harlequin shrimp	EN	Yes	Yes	1	1
	Marosina brevirostris		VU	Yes	Yes	1	1
	Marosina longirostris		VU	Yes	Yes	1	1
	Migmathelphusa olivacea		EN	Yes	Yes	1	1
	Nautilothelphusa zimmeri		VU	No	Yes	3	3
	Parathelphusa crocea		VU	Yes	Yes	1	1
	Parathelphusa pantherina		VU	Yes	Yes	1	1
	Parathelphusa possoensis		VU	Yes	Yes	1	1
	Parisia deharvengi		VU	Yes	Yes	1	1
	Sundathelphusa minahassae		VU	No	Yes	2	2
	Sundathelphusa rubra		VU	Yes	Yes	1	1
Coral							

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107186	*Acanthastrea bowerbanki*	Coral	VU	No	No	0	7
107295	*Acanthastrea brevis*	Coral	VU	No	No	7	140
107354	*Acanthastrea faviaformis*	Coral	VU	No	No	6	140
105998	*Acanthastrea hemprichii*	Coral	VU	No	No	12	140
106762	*Acanthastrea ishigakiensis*	Coral	VU	No	No	3	140
107120	*Acanthastrea regularis*	Coral	VU	No	No	11	140
106960	*Acropora abrolhosensis*	Coral	VU	No	No	3	140
107222	*Acropora aculeus*	Coral	VU	No	No	10	140
106741	*Acropora acuminata*	Coral	VU	No	No	6	140
107267	*Acropora anthocercis*	Coral	VU	No	No	7	140
106959	*Acropora aspera*	Coral	VU	No	No	9	140
107319	*Acropora awi*	Coral	VU	No	No	3	140
107079	*Acropora batunai*	Coral	VU	No	No	3	140
106940	*Acropora caroliniana*	Coral	VU	No	No	4	140
107116	*Acropora dendrum*	Coral	VU	No	No	4	140
106845	*Acropora derawanensis*	Coral	VU	No	No	3	140
107174	*Acropora desalwii*	Coral	VU	No	No	5	140
107036	*Acropora donei*	Coral	VU	No	No	6	140
107379	*Acropora echinata*	Coral	VU	No	No	10	140
107393	*Acropora elegans*	Coral	VU	No	No	4	140
107167	*Acropora globiceps*	Coral	VU	No	No	7	140
106842	*Acropora hoeksemai*	Coral	VU	No	No	6	140
107177	*Acropora horrida*	Coral	VU	No	No	7	140
107113	*Acropora indonesia*	Coral	VU	No	No	7	140
107333	*Acropora jacquelineae*	Coral	VU	No	No	2	140
107348	*Acropora kimbeensis*	Coral	VU	No	No	4	139
107045	*Acropora kirstyae*	Coral	VU	No	No	0	140
106915	*Acropora kosurini*	Coral	VU	No	No	0	52
107256	*Acropora listeri*	Coral	VU	No	No	7	140
106831	*Acropora loisetteae*	Coral	VU	No	No	0	140
107173	*Acropora lokani*	Coral	VU	No	No	4	140
107089	*Acropora lovelli*	Coral	VU	No	No	1	10
107121	*Acropora microclados*	Coral	VU	No	No	11	140

Group and Species Code	Scientific Name	Common Name	Red List Category	Single Site Endemic	Wallacea Endemic?	Num of KBA Confirmed Presence	Adjusted Number KBAs
107151	*Acropora multiacuta*	Coral	VU	No	No	1	140
106851	*Acropora palmerae*	Coral	VU	No	No	3	140
107282	*Acropora paniculata*	Coral	VU	No	No	9	140
106833	*Acropora papillare*	Coral	VU	No	No	8	140
107250	*Acropora plumosa*	Coral	VU	No	No	2	140
106736	*Acropora polystoma*	Coral	VU	No	No	9	140
107366	*Acropora retusa*	Coral	VU	No	No	1	140
106943	*Acropora russelli*	Coral	VU	No	No	2	140
106629	*Acropora simplex*	Coral	VU	No	No	1	140
107114	*Acropora solitaryensis*	Coral	VU	No	No	7	140
107132	*Acropora speciosa*	Coral	VU	No	No	6	140
107196	*Acropora spicifera*	Coral	VU	No	No	4	140
107086	*Acropora striata*	Coral	VU	No	No	3	140
107020	*Acropora tenella*	Coral	VU	No	No	3	140
106723	*Acropora turaki*	Coral	VU	No	No	4	140
106875	*Acropora vaughani*	Coral	VU	No	No	7	140
107283	*Acropora verweyi*	Coral	VU	No	No	5	140
107203	*Acropora walindii*	Coral	VU	No	No	0	140
106371	*Acropora willisae*	Coral	VU	No	No	5	140
107126	*Alveopora allingi*	Coral	VU	No	No	2	140
106926	*Alveopora daedalea*	Coral	VU	No	No	1	140
107223	*Alveopora excelsa*	Coral	VU	No	No	0	140
107274	*Alveopora fenestrata*	Coral	VU	No	No	3	140
107257	*Alveopora gigas*	Coral	VU	No	No	5	73
106710	*Alveopora marionensis*	Coral	VU	No	No	1	140
106977	*Alveopora verrilliana*	Coral	VU	No	No	2	140
106834	*Anacropora matthai*	Coral	VU	No	No	4	140
107190	*Anacropora puertogalerae*	Coral	VU	No	No	5	140
107394	*Anacropora reticulata*	Coral	VU	No	No	3	140
106613	*Anacropora spinosa*	Coral	VU	No	No	3	140
106903	*Astreopora cucullata*	Coral	VU	No	No	10	140
106925	*Astreopora incrustans*	Coral	VU	No	No	3	140
107350	*Australogyra zelli*	Coral	VU	No	No	0	140

Group and Species Code	Scientific Name	Common Name	Red List Category	Single Site Endemic	Wallacea Endemic?	Num of KBA Confirmed Presence	Adjusted Number KBAs
107163	*Barabattoia laddi*	Coral	VU	No	No	10	140
106704	*Catalaphyllia jardinei*	Coral	VU	No	No	1	140
107399	*Caulastrea curvata*	Coral	VU	No	No	4	140
107253	*Caulastrea echinulata*	Coral	VU	No	No	2	140
107358	*Cyphastrea agassizi*	Coral	VU	No	No	10	140
107115	*Cyphastrea ocellina*	Coral	VU	No	No	8	139
107375	*Echinophyllia costata*	Coral	VU	No	No	3	140
106732	*Echinopora ashmorensis*	Coral	VU	No	No	4	140
106992	*Euphyllia ancora*	Coral	VU	No	No	11	140
107323	*Euphyllia cristata*	Coral	VU	No	No	10	140
107084	*Euphyllia paraancora*	Coral	VU	No	No	2	140
106892	*Euphyllia paradivisa*	Coral	VU	No	No	4	140
107040	*Euphyllia paraglabrescens*	Coral	VU	No	No	1	11-100
106713	*Favia rosaria*	Coral	VU	No	No	2	140
107313	*Favites spinosa*	Coral	VU	No	No	1	11-100
101065	*Fungia curvata*	Coral	VU	No	No	0	140
106826	*Fungia taiwanensis*	Coral	VU	No	No	1	133
106937	*Galaxea acrhelia*	Coral	VU	No	No	5	140
107147	*Galaxea astreata*	Coral	VU	No	No	7	140
106869	*Galaxea cryptoramosa*	Coral	VU	No	No	3	140
107269	*Goniastrea ramosa*	Coral	VU	No	No	4	140
106755	*Goniopora albiconus*	Coral	VU	No	No	7	140
107170	*Goniopora burgosi*	Coral	VU	No	No	3	140
106856	*Goniopora planulata*	Coral	VU	No	No	2	140
106864	*Goniopora polyformis*	Coral	VU	No	No	1	140
106830	*Halomitra clavator*	Coral	VU	No	No	5	140
106326	*Heliofungia actiniformis*	Coral	VU	No	No	14	140
107011	*Heliopora coerulea*	Coral	VU	No	No	17	140
107001	*Isopora brueggemanni*	Coral	VU	No	No	10	140
107230	*Isopora crateriformis*	Coral	VU	No	No	4	140
107378	*Isopora cuneata*	Coral	VU	No	No	9	15
107335	*Isopora togianensis*	Coral	VU	No	No	0	53
107291	*Leptastrea aequalis*	Coral	VU	No	No	0	140

Group and Species Code	Scientific Name	Common Name	Red List Category	Single Site Endemic	Wallacea Endemic?	Num of KBA Confirmed Presence	Adjusted Number KBAs
107104	*Leptoria irregularis*	Coral	VU	No	No	2	140
107288	*Leptoseris incrustans*	Coral	VU	No	No	8	140
106970	*Leptoseris yabei*	Coral	VU	No	No	6	140
107302	*Lobophyllia dentatus*	Coral	VU	No	No	5	140
107349	*Lobophyllia diminuta*	Coral	EN	No	No	2	102
107038	*Lobophyllia serratus*	Coral	VU	No	No	2	140
	Millepora boschmai	Coral	VU	No	No	0	51
106760	*Montastrea multipunctata*	Coral	VU	No	No	0	140
106983	*Montastrea salebrosa*	Coral	VU	No	No	9	140
107400	*Montipora altasepta*	Coral	VU	No	No	2	140
106683	*Montipora angulata*	Coral	VU	No	No	2	140
107205	*Montipora australiensis*	Coral	VU	No	No	1	140
106941	*Montipora cactus*	Coral	VU	No	No	4	140
107004	*Montipora calcarea*	Coral	VU	No	No	7	25
107034	*Montipora caliculata*	Coral	VU	No	No	14	140
106625	*Montipora capricornis*	Coral	VU	No	No	1	140
107353	*Montipora cebuensis*	Coral	VU	No	No	7	140
107219	*Montipora cocosensis*	Coral	VU	No	No	3	140
106761	*Montipora corbettensis*	Coral	VU	No	No	6	140
107197	*Montipora crassituberculata*	Coral	VU	No	No	7	140
107246	*Montipora delicatula*	Coral	VU	No	No	3	140
106898	*Montipora florida*	Coral	VU	No	No	3	140
106958	*Montipora friabilis*	Coral	VU	No	No	2	140
106370	*Montipora gaimardi*	Coral	VU	No	No	2	140
106706	*Montipora hodgsoni*	Coral	VU	No	No	5	140
107198	*Montipora mactanensis*	Coral	VU	No	No	4	140
106858	*Montipora malampaya*	Coral	VU	No	No	4	140
106913	*Montipora meandrina*	Coral	VU	No	No	2	23
106372	*Montipora orientalis*	Coral	VU	No	No	1	140
107180	*Montipora samarensis*	Coral	EN	No	No	2	140
107153	*Montipora setosa*	Coral	EN	No	No	0	7
107210	*Montipora turtlensis*	Coral	VU	No	No	7	140

Group and Species Code	Scientific Name	Common Name	Red List Category	Single Site Endemic	Wallacea Endemic?	Num of KBA Confirmed Presence	Adjusted Number KBAs
107184	*Montipora verruculosus*	Coral	VU	No	No	3	140
107008	*Montipora vietnamensis*	Coral	VU	No	No	9	140
106687	*Moseleya latistellata*	Coral	VU	No	No	0	140
107129	*Mycedium steeni*	Coral	VU	No	No	1	140
107033	*Nemenzophyllia turbida*	Coral	VU	No	No	1	140
107381	*Pachyseris involuta*	Coral	VU	No	No	0	4
107213	*Pachyseris rugosa*	Coral	VU	No	No	6	140
107152	*Pavona bipartita*	Coral	VU	No	No	7	140
107296	*Pavona cactus*	Coral	VU	No	No	11	140
107068	*Pavona danai*	Coral	VU	No	No	0	140
106888	*Pavona decussata*	Coral	VU	No	No	11	139
106696	*Pavona venosa*	Coral	VU	No	No	14	140
106820	*Pectinia alcicornis*	Coral	VU	No	No	4	140
106368	*Pectinia lactuca*	Coral	EN	No	No	18	140
107389	*Pectinia maxima*	Coral	VU	No	No	4	140
107216	*Physogyra lichtensteini*	Coral	VU	No	No	14	140
106901	*Platygyra yaeyamaensis*	Coral	VU	No	No	13	140
106835	*Plerogyra discus*	Coral	VU	No	No	0	140
106862	*Pocillopora ankeli*	Coral	VU	No	No	5	140
106929	*Pocillopora danae*	Coral	VU	No	No	9	140
101074	*Pocillopora elegans*	Coral	VU	No	No	1	140
106973	*Porites aranetai*	Coral	VU	No	No	1	140
106935	*Porites attenuata*	Coral	VU	No	No	8	140
107255	*Porites cocosensis*	Coral	VU	No	No	1	140
106951	*Porites cumulatus*	Coral	EN	No	No	3	140
106711	*Porites eridani*	Coral	VU	No	No	0	140
107243	*Porites horizontalata*	Coral	VU	No	No	10	140
107150	*Porites napopora*	Coral	VU	No	No	1	140
106885	*Porites nigrescens*	Coral	EN	No	No	18	139
107096	*Porites ornata*	Coral	VU	No	No	1	140
107305	*Porites rugosa*	Coral	VU	No	No	4	140
106946	*Porites sillimaniana*	Coral	VU	No	No	3	140
107091	*Porites tuberculosa*	Coral	VU	No	No	8	140

Group and Species Code	Scientific Name	Common Name	Red List Category	Single Site Endemic	Wallacea Endemic?	Num of KBA Confirmed Presence	Adjusted Number KBAs
101052	*Psammocora stellata*	Coral	EN	No	No	1	12
107277	*Seriatopora aculeata*	Coral	VU	No	No	3	140
107199	*Seriatopora dendritica*	Coral	EN	No	No	6	140
106968	*Stylocoeniella cocosensis*	Coral	EN	No	No	0	140
106953	*Symphyllia hassi*	Coral	VU	No	No	7	140
106821	*Turbinaria bifrons*	Coral	VU	No	No	0	140
107047	*Turbinaria heronensis*	Coral	VU	No	No	0	140
107363	*Turbinaria mesenterina*	Coral	VU	No	No	15	140
106996	*Turbinaria patula*	Coral	VU	No	No	1	140
107254	*Turbinaria peltata*	Coral	VU	No	No	7	140
107401	*Turbinaria reniformis*	Coral	VU	No	No	12	140
107179	*Turbinaria stellulata*	Coral	VU	No	No	7	140
Fresh Water Mollusks							
	Corbicula possoensis		EN	Yes	Yes	1	1
	Miratesta celebensis		VU	Yes	Yes	1	1
	Tylomelania kruimeli		CR	Yes	Yes	1	1
Marine Mollusks							
66671	*Tridacna derasa*	Giant clam	VU	No	No	2	140
66672	*Tridacna gigas*	Giant clam	VU	No	No	4	140
Sea Cucumber							
	Actinopyga echinites	Brownfish, deep water redfish	VU	No	No	0	140
	Actinopyga mauritiana	Surf redfish	VU	No	No	0	140
	Actinopyga miliaris	Blackfish, hairy blackfish	VU	No	No	0	140
	Holothuria fuscogilva	White teatfish	VU	No	No	4	134
	Holothuria lessoni	Golden sandfish	EN	No	No	2	140
	Holothuria nobilis	Black teatfish	EN	No	No	0	7
	Holothuria scabra	Golden sandfish, sandfish	EN	No	No	0	140
	Holothuria whitmaei	Black teatfish	EN	No	No	0	28
	Stichopus herrmanni	Curryfish	VU	No	No	0	140
	Thelenota ananas	Prickly redfish	EN	No	No	1	139
Plant							
	Agathis dammara	Amboina pitch tree	VU	No	No	8	11-100
77674	*Aglaia ceramica*		VU	No	Yes	1	<10

Group and Species Code	Scientific Name	Common Name	Red List Category	Single Site Endemic	Wallacea Endemic?	Num of KBA Confirmed Presence	Adjusted Number KBAs
76703	*Aglaia smithii*		VU	No	No	4	4
80488	*Aquilaria cumingiana*	Agarwood	VU	No	No	4	5
1010245	*Avicennia rumphiana*		VU	No	No	1	11-100
1005862	*Camptostemon philippinense*		EN	No	No	1	11-100
72739	*Clethra javanica*		VU	No	No	2	11-100
77863	*Cupaniopsis strigosa*		VU	Yes	Yes	1	1
68681	*Cycas falcata*		VU	No	Yes	3	3
72276	*Diospyros celebica*	Makassar black ebony	VU	No	Yes	16	11-100
78495	*Dipterocarpus retusus*		VU	No	No	3	>100
77875	*Elattostachys erythrocarpum*		VU	No	Yes	2	2
73542	*Erythrina euodiphylla*		VU	No	No	0	3
74917	*Goniothalamus majestatis*		VU	No	Yes	3	3
74814	*Gonystylus macrophyllus*	Ramin wood	VU	No	No	4	>100
77888	*Guioa asquamosa*		VU	No	Yes	2	3
75204	*Guioa malukuensis*		VU	Yes	Yes	1	1
75214	*Guioa patentinervis*		VU	No	Yes	3	3
78517	*Hopea celebica*		EN	No	Yes	2	2
78532	*Hopea gregaria*		EN	No	Yes	5	5
80574	*Hopea sangal*	Sangal	CR	No	No	3	>100
74768	*Horsfieldia decalvata*		VU	No	Yes	3	3
74188	*Horsfieldia talaudensis*		VU	No	Yes	2	2
73665	*Intsia bijuga*	Moluccan ironwood	VU	No	No	14	11-100
73669	*Kalappia celebica*		VU	No	Yes	5	5
73421	*Kibatalia wigmani*		VU	No	Yes	2	2
75078	*Knema celebica*		VU	Yes	Yes	1	1
73309	*Knema matanensis*		VU	Yes	Yes	1	1
75111	*Knema steenisii*		VU	Yes	Yes	1	1
71701	*Madhuca betis*	Betis	VU	No	No	3	11-100
80223	*Madhuca boerlageana*		CR	No	No	3	3
78672	*Mammea timorensis*		VU	No	Yes	1	3
80915	*Mangifera altissima*		VU	No	No	2	>100
80924	*Mangifera pedicellata*		VU	No	No	1	11-100

Group and Species Code	Scientific Name	Common Name	Red List Category	Single Site Endemic	Wallacea Endemic?	Num of KBA Confirmed Presence	Adjusted Number KBAs
77535	*Mangifera rufocostata*		VU	No	No	1	11-100
77537	*Mangifera sumbawaensis*		VU	No	Yes	4	4
	Mangifera timorensis		EN	No	Yes	7	7
80928	*Mangifera transversalis*		VU	Yes	Yes	1	1
80257	*Manilkara kanosiensis*		EN	No	Yes	1	<10
75118	*Myristica alba*		VU	No	Yes	2	3
75292	*Myristica devogelii*		VU	Yes	Yes	1	1
75297	*Myristica fissurata*		VU	Yes	Yes	1	1
75314	*Myristica kjellbergii*		VU	No	Yes	2	2
75332	*Myristica perlaevis*		VU	Yes	Yes	1	1
75339	*Myristica pubicarpa*		VU	No	Yes	2	2
75341	*Myristica robusta*		VU	No	Yes	1	<10
75352	*Myristica ultrabasica*		VU	No	Yes	1	<10
76257	*Nepenthes danseri*		VU	Yes	Yes	1	1
76266	*Nepenthes eymae*		VU	No	Yes	2	2
76270	*Nepenthes glabrata*		VU	No	Yes	1	<10
76274	*Nepenthes hamata*		VU	No	Yes	5	5
76320	*Nepenthes tomoriana*		VU	No	Yes	2	2
72408	*Palaquium bataanense*		VU	No	No	2	2
	Paphiopedilum mastersianum		EN	No	Yes	4	4
73790	*Pericopsis mooniana*	Nandu wood, Nedun tree	VU	No	No	2	2
	Podocarpus polystachyus	Sea teak	VU	No	No	2	>100
73825	*Pterocarpus indicus*	Amboyna wood	VU	No	No	10	11-100
76935	*Santalum album*	Sandalwood	VU	No	Yes	13	11-100
78582	*Shorea montigena*		CR	No	Yes	5	5
77120	*Shorea selanica*		CR	No	Yes	11	11
73868	*Sympetalandra schmutzii*		VU	No	Yes	2	2
74121	*Tabernaemontana remota*		VU	No	No	2	2
68646	*Taxus wallichiana*	Himalayan yew	EN	No	No	4	>100
75549	*Terminalia kangeanensis*		VU	No	No	2	11-100
78216	*Vatica flavovirens*		CR	No	Yes	6	6
80358	*Vitex parviflora*	Molave	VU	No	No	5	>100

Appendix 2. Terrestrial KBA Data

2.1 Indonesia

Code	KBA Name	IBA Code	AZE Code	Area Within Protected Area	Total Area (ha)	Forest Cover 2000	Forest Cover 2011
IDN003	Karakelang Utara	ID 160	IDN 10	24,222	32,242	20,205	19,465
IDN004	Karakelang Selatan	No	IDN 10	4,586	6,559	4,133	4,133
IDN005	Pulau Salibabu	ID 161	IDN 23		9,082	1,417	1,417
IDN007	Pulau Kabaruan	ID 162	No		9,444	3,847	3,847
IDN010	Gunung Awu	ID 163	No		3,043	2,245	2,156
IDN011	Tahuna	No	No		2,248	2,147	2,147
IDN012	Gunung Sahendaruman	ID 164	IDN 18		4,392	1,413	482
IDN015	Pulau Siau	ID 165	IDN 25		11,662	3,208	2,897
IDN019	Likupang	ID 167	No		895	533	533
IDN021	Mawori	No	No	3,955	3,955	1,522	1,522
IDN022	Tangkoko Dua Sudara	ID 166	No	9,532	9,649	7,679	5,809
IDN024	Lembeh	No	No		1,752	519	
IDN025	Gunung Klabat	ID 169	No		3,538	3,555	3,531
IDN027	Danau Tondano	No	No		6,367	14	
IDN028	Soputan — Manimporok	No	No		9,955	6,488	5,768
IDN029	Mahawu — Masarang	ID 168	No		878	798	798
IDN030	Gunung Lokon	No	No	1,725	3,642	2,517	2,452
IDN031	Gunung Manembo-nembo	No	No	4,285	4,879	4,036	4,036
IDN034	Gunung Sinonsayang	No	No		1,101	939	939
IDN035	Gunung Ambang	No	No	14,784	21,102	19,348	17,932
IDN036	Gunung Simbalang	ID 170	No		35,436	32,079	31,436
IDN037	Bogani Nani Wartabone	ID 171	No	274,022	400,094	370,603	364,917
IDN038	Tanjung Binerean	No	No		636	28	28
IDN041	Milangodaa	No	No		1,136		
IDN042	Puncak Botu	No	No		392	414	
IDN043	Molonggota	No	No				

Code	KBA Name	IBA Code	AZE Code	Area Within Protected Area	Total Area (ha)	Forest Cover 2000	Forest Cover 2011
					2,225	120	110
IDN046	Mas Popaya Raja	No	No	158	158	73	73
IDN047	Tangale	No	No	1,132	1,132	82	82
IDN048	Muara Paguyaman Pantai	No	No		8,216	7,075	6,167
IDN049	Nantu	No	No	34,274	53,506	52,627	52,019
IDN050	Dulamayo	No	No		25,455	25,402	25,320
IDN052	Panua	No	No	50,715	50,715	46,142	43,032
IDN053	Popayato–Paguat	ID 228	No		72,256	72,094	72,054
IDN054	Gunung Ile-Ile	No	No		23,774	23,747	23,747
IDN055	Tanjung Panjang	No	No	7,527	7,605	4,368	946
IDN057	Buol–Tolitoli	No	No		174,569	173,680	173,427
IDN058	Gunung Dako	No	No	22,500	64,774	61,407	61,350
IDN060	Gunung Tinombala	No	No	28,225	46,086	45,914	45,662
IDN061	Gunung Sojol	No	No	61,354	96,182	91,695	91,334
IDN062	Siraro	No	No		793	631	563
IDN064	Pasoso	ID 177	No		19,256	18,458	18,450
IDN066	Pegunungan Tokalekaju	ID 174	No	12,543	400,577	384,521	366,599
IDN067	Lore Lindu	ID 172	No	205,083	255,390	225,101	225,101
IDN069	Tambu	No	No		10,225	6,061	6,061
IDN071	Lariang	No	No		7,358	1,686	1,617
IDN072	Pambuang	No	No		166,865	166,691	166,604
IDN073	Danau Poso	No	No	24,835	69,079	28,440	28,440
IDN074	Morowali	ID 173	IDN 14	212,672	282,039	252,463	243,204
IDN075	Gunung Lumut	No	No		95,767	91,931	90,701
IDN076	Tanjung Colo	No	No	3,254	3,410	3,188	3,088
IDN078	Kepulauan Togean	ID 175	No	76,412	76,412	62,869	58,128
IDN080	Bakiriang	No	No	12,249	73,277	66,310	65,963
IDN082	Labobo–Bangkurung	ID 176	IDN 19		18,657	11,581	11,581

Code	KBA Name	IBA Code	AZE Code	Area Within Protected Area	Total Area (ha)	Forest Cover 2000	Forest Cover 2011
IDN083	Kokolomboi	No	No		50,614	48,380	48,380
IDN084	Bajomote — Pondipondi	No	No		52,025	48,438	48,394
IDN085	Timbong	No	No		22,730	22,330	22,330
IDN086	Balantak	No	No		42,616	40,402	37,042
IDN088	Pulau Seho	ID 204	No	2,192	2,741	111	111
IDN089	Taliabu Utara	ID 203	IDN 27	17,771	156,112	65,438	64,799
IDN091	Buya	No	No		27,466	13,298	13,298
IDN092	Loku	No	No		23,369	11,031	11,020
IDN093	Sanana	No	IDN 24		36,967	16,159	15,958
IDN095	Feruhumpenai–Matano	ID 186	No	117,241	142,903	109,659	108,266
IDN096	Danau Mahalona	No	No	2,306	5,171	2,132	2,109
IDN097	Danau Towuti	No	No	63,908	96,662	30,639	30,610
IDN098	Routa	No	No		144,439	143,521	143,319
IDN099	Lamiko-miko	No	No		34,523	7,015	6,621
IDN101	Mekongga	ID 178	No	4,331	472,289	456,836	451,490
IDN103	Lamadae	No	No	669	669	674	674
IDN104	Rawa Aopa Watumohai	ID 179	No	111,396	143,858	63,184	56,438
IDN106	Nipa-nipa	No	No	7,895	7,895	131	131
IDN108	Tanjung Peropa	No	No	40,499	41,694	38,494	38,430
IDN109	Pulau Wawonii	No	No		71,702	33,734	33,388
IDN110	Tanjung Batikolo	No	No	3,992	3,992	3,447	3,447
IDN111	Baito–Wolasi	No	No		23,616	22,856	22,812
IDN114	Muna Timur	No	No		32,912	16,784	16,784
IDN115	Buton Utara	ID 181	No	92,679	118,135	109,059	108,280
IDN116	Lambusango	ID 180; ID 182; ID 183	No	31,043	59,214	50,719	50,719
IDN118	Ambuau	No	No		3,570	957	957
IDN120	Wakatobi	ID 184	No	2,353	44,964	3,280	3,280
IDN123	Pulau Kadatua	No	No		2,422		

Code	KBA Name	IBA Code	AZE Code	Area Within Protected Area	Total Area (ha)	Forest Cover 2000	Forest Cover 2011
IDN124	Gunung Watusangia	No	No		17,171	13,400	13,400
IDN126	Mambuliling	No	No		265,951	210,549	204,370
IDN127	Mamuju	No	No		18,245	13,968	13,800
IDN129	Pegunungan Latimojong	ID 188	No		149,037	115,429	112,880
IDN130	Danau Tempe	ID 185	No		32,024		
IDN131	Pallime	No	No		5,434	93	93
IDN133	Cani Sirenreng	No	No	3,769	14,435	5,883	5,584
IDN134	Bantimurung Bulusaraung	No	No	44,601	47,846	32,171	32,171
IDN135	Bulurokeng	No	No		7,147	25	25
IDN137	Komara	No	No	7,003	30,049	4,710	4,468
IDN138	Karaeng–Lompobattang	ID 187	IDN 6	4,777	32,814	19,010	18,687
IDN140	Pulau Selayar	ID 191	No		66,622	20,231	127
IDN143	Pulau Tana Jampea	ID 189	IDN 28		16,285	7,889	7,670
IDN144	Pulau Kalatoa	ID 190	No		8,038		
IDN145	Morotai	ID 192	No		239,680	108,809	107,537
IDN147	Pulau Rao	No	No		11,193	274	274
IDN149	Galela	ID 193	No		3,361	443	443
IDN150	Gunung Dukono	No	No		54,763	25,619	24,181
IDN153	Halmahera Timur	ID 198; ID 200	No	171,332	369,723	180,079	178,818
IDN154	Hutan Bakau Dodaga	ID 199	No		2,472	1,097	1,097
IDN156	Kao	No	No		4,911	745	745
IDN158	Gamkonora	ID 194	No		86,718	25,510	24,390
IDN160	Tanah Putih	ID 195	No		10,731	5,187	5,187
IDN161	Rawa Sagu Ake Jailolo	ID 196	No		1,384	569	569
IDN163	Ternate	No	No		9,080	4,036	4,036
IDN164	Tidore	No	No		6,882	1,851	1,694
IDN165	Aketajawe	ID 197	No	153,483	168,083	81,854	81,684
IDN167	Dote–Kobe	No	No		27,894	12,738	12,731

Code	KBA Name	IBA Code	AZE Code	Area Within Protected Area	Total Area (ha)	Forest Cover 2000	Forest Cover 2011
IDN170	Pulau Kayoa	No	No		13,605	5,381	5,381
IDN171	Kasiruta	No	No		21,783	10,737	10,737
IDN172	Yaba	No	No		20,158	9,821	9,663
IDN173	Gorogoro	No	No		25,964	12,773	12,773
IDN174	Saketa	No	No		16,940	7,734	7,734
IDN177	Tutupa	No	No		16,568	8,264	8,264
IDN178	Gunung Sibela	ID 201	No	40,894	54,990	21,473	20,388
IDN179	Mandioli	No	No		12,078	5,019	4,863
IDN182	Obilatu	No	No		3,549	1,637	1,637
IDN183	Danau Manis	No	No		5,164	871	871
IDN184	Wayaloar	No	No		21,336	8,858	8,813
IDN185	Gunung Batu Putih	ID 202	No	30,110	75,558	36,701	36,701
IDN186	Cabang Kuning	No	No		9,336	2,284	2,284
IDN188	Pulau Obit	No	No	6,522	7,125		
IDN192	Gunung Kepala Madang	ID 205	IDN 5		133,317	95,920	93,622
IDN193	Waemala	No	No		10,901	3,384	3,384
IDN194	Danau Rana	ID 206	No		63,100	54,158	53,743
IDN195	Leksula	No	No		80,085	65,238	63,407
IDN196	Teluk Kayeli	ID 207	No		5,699	3,504	3,504
IDN199	Pulau Buano	ID 208	IDN 20		13,616	4,835	4,835
IDN200	Gunung Sahuwai	ID 209	No	20,325	25,816	19,182	19,182
IDN201	Luhu	No	No	4,923	4,923		
IDN202	Tullen Batae	No	No		5,040	5,033	5,033
IDN203	Pulau Kassa	No	No		44	53	53
IDN204	Pegunungan Paunusa	ID 210	No		59,525	50,424	50,043
IDN205	Gunung Salahutu	ID 213	No		10,135	8,847	8,847
IDN207	Leitimur	No	No		16,671	14,944	14,916
IDN210	Haruku	ID 214	No		7,937	6,685	6,685

Code	KBA Name	IBA Code	AZE Code	Area Within Protected Area	Total Area (ha)	Forest Cover 2000	Forest Cover 2011
IDN211	Saparua	No	No		1,859	1,586	1,586
IDN212	Manusela	ID 211	IDN 13	163,174	248,077	223,089	222,457
IDN213	Waebula	ID 212	No		63,514	54,114	53,916
IDN214	Tanah Besar	No	No		49,137	43,678	43,462
IDN218	Kepulauan Banda	No	No	1,128	5,018	357	357
IDN220	Kepulauan Tayandu	ID 216	No		11,585	3,833	3,833
IDN222	Pegunungan Daab–Boo	ID 217	IDN 9	14,180	28,623	23,998	23,985
IDN223	Pulau Manuk	ID 215	No	493	493	43	43
IDN226	Pulau Gunung Api	ID 225	No	74	74	55	55
IDN227	Batu Gendang	No	No	456	12,412	6,683	6,261
IDN231	Gunung Rinjani	ID 117	No	37,225	139,270	106,313	105,360
IDN234	Bumbang	No	No	1,098	1,385	1,285	1,285
IDN235	Sekaroh	No	No		2,728	450	450
IDN237	Tatar Sepang	ID 119	No	9,531	70,303	57,907	57,339
IDN238	Taliwang	ID 118	No	1,021	5,494	1,084	1,084
IDN241	Puncak Ngengas	ID 120	No	568	76,224	58,440	44,820
IDN242	Dodo Jaranpusang	ID 121	No		93,299	89,860	88,094
IDN244	Pulau Moyo	ID 122	No	28,693	29,997	14,305	14,108
IDN246	Gunung Tambora	ID 123	No	55,499	106,257	50,849	50,551
IDN248	Empang	No	No		42,331	41,971	41,971
IDN257	Rokoraka–Matalombu	No	No		3,529		
IDN258	Cambaka	No	No		841		
IDN259	Danggamangu	No	No		495	478	478
IDN260	Yawila	ID 145	No		4,060	2,240	2,240
IDN261	Lamboya	No	No		1,767	1,512	1,512
IDN262	Poronumbu	ID 144	No		1,814	213	213
IDN264	Kaliasin	No	No		201		
IDN265	Lokusobak	No	No		2,965	2,925	2,925

Code	KBA Name	IBA Code	AZE Code	Area Within Protected Area	Total Area (ha)	Forest Cover 2000	Forest Cover 2011
IDN266	Baliledo	No	No		839	515	515
IDN267	Pahudu Tilu	No	No		522		
IDN268	Manupeu Tanadaru	ID 146	No	46,898	51,887	34,580	34,580
IDN271	Tarimbang	No	No		12,668	11,766	11,766
IDN272	Lai Kayambi	No	No		6,607	5,655	5,655
IDN273	Praipaha Mandahu	No	No		2,191	1,218	1,218
IDN274	Yumbu–Kandara	No	No		7,947	519	519
IDN275	Laiwanggi Wanggameti	ID 147	No	37,809	50,004	35,260	35,260
IDN277	Tanjung Ngunju	ID 148	No		14,674	13,894	13,894
IDN279	Luku Melolo	ID 149	No		5,696	3,801	3,801
IDN280	Komodo–Rinca	ID 124	No	60,742	61,698	17,389	16,512
IDN282	Wae Wuul	ID 125	No	1,244	4,552	28	28
IDN283	Nggorang Bowosie	ID 126	No		13,990	9,438	9,438
IDN284	Mbeliling–Tanjung Kerita Mese	ID 127	No		33,549	16,851	16,851
IDN285	Sesok	ID 128	No		6,569	5,334	5,334
IDN286	Nangalili	No	No		428		
IDN287	Todo Repok	ID 129	No		16,541	14,686	14,686
IDN288	Ruteng	ID 130	IDN 22	30,075	40,744	32,750	32,679
IDN289	Gapong	ID 131	No		14,960	1,849	1,849
IDN290	Pota	No	No		717		
IDN291	Nangarawa	ID 132	No		10,885	2,218	2,218
IDN292	Gunung Inerie	ID 133	No	5,527	11,661	5,021	5,021
IDN293	Aegela	ID 135	No		4,054	2,297	2,297
IDN294	Wolo Tado	ID 134	No	5,050	9,340	729	729
IDN296	Pulau Ontoloe	No	No	377	377	25	25
IDN297	Mausambi	ID 136	No	975	3,552	3,521	3,521
IDN298	Kelimutu	No	No	5,424	6,320	5,675	5,675
IDN300	Tanjung Watu Mana	No	No		433		

Code	KBA Name	IBA Code	AZE Code	Area Within Protected Area	Total Area (ha)	Forest Cover 2000	Forest Cover 2011
IDN303	Pulau Besar	ID 137	No	5,327	5,327	3,887	3,887
IDN304	Egon Ilimedo	ID 138	No	1,842	27,716	15,527	15,527
IDN305	Ili Wengot	ID 139	No		4,097	3,363	3,363
IDN306	Gunung Lewotobi	ID 140	No		9,832	7,134	7,134
IDN308	Larantuka	No	No		2,420	2,384	2,384
IDN309	Tanjung Watupayung	No	No		7,351	2,974	2,932
IDN312	Lamalera	ID 141	No		5,891	5,683	5,683
IDN313	Lembata	No	No		30,821	28,894	28,894
IDN315	Pantar	No	No		14,255	12,405	12,405
IDN317	Gunung Muna	ID 142	No		9,598	7,759	7,759
IDN319	Mainang	No	No		7,294	7,281	7,281
IDN321	Tuti Adagae	ID 143	No	12,414	24,348	19,526	19,491
IDN322	Kunggwera	No	No		8,803	5,994	4,784
IDN323	Pulau Redong	No	No		359	359	359
IDN324	Gunung Arnau	ID 227	No	45,895	67,131	48,920	48,920
IDN325	Danau Tihu	No	No		8,737	6,099	6,099
IDN327	Pulau Romang	ID 224	No		17,257	8,404	7,743
IDN329	Kepulauan Lemola	ID 226	No		57,487	1,840	1,723
IDN332	Pulau Damar	ID 223	No		19,607	12,357	12,357
IDN334	Pulau Babar	ID 222	No		61,842	42,680	42,667
IDN336	Tanimbar Tengah	ID 221	No	59,144	116,888	101,442	100,886
IDN338	Pulau Larat	ID 220	No	4,002	21,974	7,271	7,271
IDN340	Kateri–Maubesi	ID 159	No	9,960	14,793	8,616	8,616
IDN341	Gunung Mutis	ID 156	No	14,674	52,788	43,327	43,268
IDN342	Buat–Soe	ID 158	No		10,656	10,152	10,152
IDN343	Oenasi	ID 157	No		13,320	8,414	8,414
IDN344	Manipo	ID 154	No	7,094	14,610	4,441	4,441
IDN345	Camplong	ID 153	No	820	12,714	5,437	5,437

Code	KBA Name	IBA Code	AZE Code	Area Within Protected Area	Total Area (ha)	Forest Cover 2000	Forest Cover 2011
IDN346	Gunung Timau	ID 155	No		36,150	31,495	31,495
IDN347	Bipolo	ID 152	No		417	143	143
IDN349	Teluk Kupang	ID 151	No	411	15,452	105	105
IDN350	Semau	ID 150	No	438	4,497	1,646	1,646
IDN352	Rote Utara	No	IDN 21	1,869	20,943	12,884	12,824
IDN353	Danau Peto	No	IDN 21		938	105	105
IDN356	Pulau Dana	No	No		3,929		

2.2 Timor-Leste

Code	KBA Name	IBA Code	AZE Code	Extreme Priority KBA	Minimum Critical Network	Area Within Protected Area	Total Area (ha)	Forest Cover 2000	Forest Cover 2011
TLS001	Nino Konis Santana	TL 06; TL 07; TL 08	No	No	Yes	No data	67,483	No data	No data
TLS003	Nari	No	No	No	No	No data	3,076	No data	No data
TLS005	Legumau	No	No	No	No	No data	10,009	No data	No data
TLS006	Monte Matebian	No	No	No	No	No data	10,317	No data	No data
TLS007	Irabere–Iliomar	TL 16	No	No	No	No data	16,400	No data	No data
TLS009	Monte Builo	No	No	No	No	No data	6,974	No data	No data
TLS010	Mundo Perdido	No	No	No	Yes	No data	25,899	No data	No data
TLS013	Subaun	TL 15	No	No	No	No data	23,665	No data	No data
TLS014	Laleia	No	No	No	No	No data	8,817	No data	No data
TLS015	Monte Aitana — Bibileo	No	No	No	No	No data	10,027	No data	No data
TLS016	Monte Diatuto	TL 09	No	No	No	No data	37,486	No data	No data
TLS017	Monte Mak Fahik–Sarim	TL 12	No	No	No	No data	2,933	No data	No data
TLS018	Sungai Klere	TL 05	No	No	No	No data	41,868	No data	No data
TLS020	Monte Tatamailau	TL 02	No	No	No	No data	30,245	No data	No data
TLS021	Leimia Kraik	No	No	No	No	No data	2,853	No data	No data

Code	KBA Name	IBA Code	AZE Code	Extreme Priority KBA	Minimum Critical Network	Area Within Protected Area	Total Area (ha)	Forest Cover 2000	Forest Cover 2011
TLS022	Areia Branca no Dolok Oan	TL 14	No	No	No	No data	2,916	No data	No data
TLS024	Atauro Island	TL 04	No	No	No	No data	14,184	No data	No data
TLS027	Tasitolu	TL 13	No	No	No	No data	1,543	No data	No data
TLS028	Fatumasin	TL 03	No	No	No	No data	13,541	No data	No data
TLS029	Maubara	TL 11	No	No	No	No data	5,281	No data	No data
TLS032	Be Malae	TL 09	No	No	No	No data	27,832	No data	No data
TLS033	Tilomar	TL 01	No	No	No	No data	5,348	No data	No data
TLS035	Citrana	No	No	No	No	No data	10,924	No data	No data

2.3 List of contiguous Terrestrial and Marine KBAs

Terrestrial Code and Name		Marine KBA/Candidate KBA Code and Name		Bioregion	Province/Timor-Leste District	Relationship between KBAs
IDN005	Pulau Salibabu	IDN006	Perairan Talaud Selatan	Sulawesi	North Sulawesi	Adjacent
IDN007	Pulau Kabaruan	IDN006	Perairan Talaud Selatan	Sulawesi	North Sulawesi	Inside
IDN015	Pulau Siau	IDN014	Perairan Siau	Sulawesi	North Sulawesi	Inside
IDN019	Likupang	IDN018	Perairan Likupang	Sulawesi	North Sulawesi	Adjacent
IDN021	Mawori	IDN020	Molaswori	Sulawesi	North Sulawesi	Inside
IDN038	Tanjung Binerean	IDN039	Perairan Tanjung Binerean	Sulawesi	North Sulawesi	Adjacent
IDN052	Panua	IDN051	Perairan Panua	Sulawesi	Gorontalo	Adjacent
IDN064	Pasoso	IDN065	Tanjung Manimbaya	Sulawesi	Central Sulawesi	Adjacent
IDN078	Kepulauan Togean	IDN077	Perairan Kepulauan Togean	Sulawesi	Central Sulawesi	Inside
IDN082	Labobo–Bangkurung	IDN081	Perairan Peleng — Banggai	Sulawesi	Central Sulawesi	Inside
IDN099	Lamiko–Miko	IDN100	Perairan Lamiko-miko	Sulawesi	South Sulawesi	Adjacent
IDN120	Wakatobi	IDN119	Perairan Wakatobi	Sulawesi	Southeast Sulawesi	Inside
IDN123	Pulau Kadatua	IDN122	Basilika	Sulawesi	Southeast Sulawesi	Inside
IDN127	Mamuju	IDN128	Perairan Mamuju	Sulawesi	West Sulawesi	Adjacent
IDN131	Pallime	IDN132	Perairan Pallime	Sulawesi	South Sulawesi	Adjacent
IDN135	Bulurokeng	IDN136	Kapoposang–PangkepBulurokeng	Sulawesi	South Sulawesi	Adjacent
IDN140	Pulau Selayar	IDN139	Kepulauan Selayar	Sulawesi	South Sulawesi	Inside

Terrestrial Code and Name		Marine KBA/Candidate KBA Code and Name		Bioregion	Province/Timor-Leste District	Relationship between KBAs
IDN143	Pulau Tana Jampea	IDN142	Perairan Tana Jampea	Sulawesi	South Sulawesi	Inside
IDN144	Pulau Kalatoa	IDN142	Perairan Tana Jampea	Sulawesi	South Sulawesi	Inside
IDN147	Pulau Rao	IDN146	Pulau-pulau Pesisir Morotai	Maluku	North Maluku	Inside
IDN167	Dote–Kobe	IDN168	Perairan Dote-Kobe	Maluku	North Maluku	Adjacent
IDN170	Pulau Kayoa	IDN169	Kayoa	Maluku	North Maluku	Inside
IDN186	Cabang Kuning	IDN187	Selat Obi	Maluku	North Maluku	Adjacent
IDN188	Pulau Obit	IDN189	Perairan Pulau Obit	Maluku	North Maluku	Inside
IDN196	Teluk Kayeli	IDN197	Perairan Teluk Kayeli	Maluku	Maluku	Adjacent
IDN199	Pulau Buano	IDN198	Kelang–Kassa–Buano –Marsegu	Maluku	Maluku	Inside
IDN201	Luhu	IDN198	Kelang–Kassa–Buano –Marsegu	Maluku	Maluku	Inside
IDN203	Pulau Kassa	IDN198	Kelang–Kassa–Buano –Marsegu	Maluku	Maluku	Inside
IDN214	Tanah Besar	IDN215	Perairan Tanah Besar	Maluku	Maluku	Adjacent
IDN218	Kepulauan Banda	IDN217	Perairan Kepulauan Banda	Maluku	Maluku	Inside
IDN220	Kepulauan Tayandu	IDN219	Perairan Kepulauan Tayandu	Maluku	Maluku	Inside
IDN223	Pulau Manuk	IDN224	Perairan Pulau Manuk	Maluku	Maluku	Inside
IDN227	Batu Gendang	IDN228	Perairan Batu Gendang	Lesser Sundas	West Nusa Tenggara	Adjacent
IDN234	Bumbang	IDN233	Perairan Bumbang	Lesser Sundas	West Nusa Tenggara	Adjacent
IDN235	Sekaroh	IDN233	Perairan Bumbang	Lesser Sundas	West Nusa Tenggara	Adjacent
IDN237	Tatar Sepang	IDN236	Lunyuk Besar	Lesser Sundas	West Nusa Tenggara	Adjacent
IDN248	Empang	IDN249	Perairan Empang	Lesser Sundas	West Nusa Tenggara	Adjacent
IDN268	Manupeu Tanadaru	IDN269	Tangairi–Lukulisi–Konda Maloba	Lesser Sundas	East Nusa Tenggara	Adjacent
IDN271	Tarimbang	IDN270	Perairan Tarimbang	Lesser Sundas	East Nusa Tenggara	Adjacent
IDN277	Tanjung Ngunju	IDN278	Perairan Tanjung Ngunju	Lesser Sundas	East Nusa Tenggara	Adjacent
IDN280	Komodo–Rinca	IDN281	Perairan Komodo–Rinca	Lesser Sundas	East Nusa Tenggara	Inside
IDN296	Pulau Ontoloe	IDN295	Riung 17 Pulau	Lesser Sundas	East Nusa Tenggara	Adjacent
IDN303	Pulau Besar	IDN302	Teluk Maumere	Lesser Sundas	East Nusa Tenggara	Inside
IDN304	Egon Ilimedo	IDN302	Teluk Maumere	Lesser Sundas	East Nusa Tenggara	Adjacent
IDN315	Pantar	IDN314	Selat Pantar	Lesser Sundas	East Nusa Tenggara	Adjacent
IDN317	Gunung Muna	IDN318	Perairan Gunung Muna	Lesser Sundas	East Nusa Tenggara	Adjacent
IDN327	Pulau Romang	IDN326	Kepulauan Kisar	Lesser Sundas	Maluku	Inside
IDN329	Kepulauan Lemola	IDN328	Perairan Kepulauan Lemola	Lesser Sundas	Maluku	Inside

Terrestrial Code and Name		Marine KBA/Candidate KBA Code and Name		Bioregion	Province/Timor-Leste District	Relationship between KBAs
IDN332	Pulau Damar	IDN331	Kepulauan Damar	Lesser Sundas	Maluku	Inside
IDN336	Tanimbar Tengah	IDN337	Selat Yamdena	Lesser Sundas	Maluku	Adjacent
IDN338	Pulau Larat	IDN339	Kepulauan Larat-Fordata	Lesser Sundas	Maluku	Inside
IDN349	Teluk Kupang	IDN348	Perairan Teluk Kupang	Lesser Sundas	East Nusa Tenggara	Adjacent
IDN352	Rote Utara	IDN351	Perairan Rote Utara	Lesser Sundas	East Nusa Tenggara	Adjacent
IDN356	Pulau Dana	IDN355	Perairan Pulau Dana	Lesser Sundas	East Nusa Tenggara	Inside
TLS001	Nino Konis Santana	TLS002	Perairan Nino Konis Santana	Lesser Sundas	Lautem	Adjacent
TLS007	Irabere–Iliomar	TLS008	Perairan Irabere–Iliomar	Lesser Sundas	Viqueque and Lautem	Adjacent
TLS013	Subaun	TLS012	Perairan Subaun	Lesser Sundas	Dili and Manatuto	Adjacent
TLS018	Sungai Klere	TLS019	Perairan Sungai Klere	Lesser Sundas	Manufahi and Manatuto	Adjacent
TLS022	Areia Branca no Dolok Oan	TLS023	Perairan Areia Branca no Dolok Oan	Lesser Sundas	Dili	Adjacent
TLS024	Atauro Island	TLS025	Perairan Atauro	Lesser Sundas	Dili	Inside
TLS027	Tasitolu	TLS026	Perairan Tasitolu	Lesser Sundas	Dili	Adjacent
TLS029	Maubara	TLS030	Perairan Maubara	Lesser Sundas	Liquica	Adjacent
TLS032	Be Malae	TLS031	Perairan Be Malae	Lesser Sundas	Bobonara	Adjacent
TLS033	Tilomar	TLS034	Perairan Tilomar	Lesser Sundas	Covalima	Adjacent

Appendix 3. Ranking of KBAs by Vulnerability and Irreplaceability Scores

The methodology for allocation of KBAs to extreme, high, medium and low is described in Chapter 4 and follows Langhammer *et al*. (1987). Based on these allocation KBAs were ranked from 1 to 7 (Table A5.1). Twenty-four KBAs emerged as top-ranked, 77 ranked 2, and 78 ranked 3 (Table A5.2). A complete list of KBAs with summary data on number of threatened and single site species is in Table A5.3.

Table A5.1. Allocations of Ranks Based on a Combination of Irreplacebility and Vulnerability Categories

		Irreplaceability			
		Extreme	**High**	**Medium**	**Low**
Vulnerability	**Extreme**	1	2	3	4
	High	2	3	4	5
	Medium	3	4	5	6
	Low	4	5	6	7

Table A5.2. Number of KBAs with Different Combinations of Irreplacebility and Vulnerability Categories

		Irreplaceability			
		Extreme	**High**	**Medium**	**Low**
Vulnerability	**Extreme**	24	68	38	0
	High	9	36	4	0
	Medium	4	31	18	11
	Low	0	0	0	8

Table A5.3. List of Terrestrial KBAs with Irreplacebility and Vulnerability Categories and Rank
(KBAs are listed by rank, and within rank by total number of single site species, and then total number of globally threatened species)

KBA Code	KBA Name	Bio-region	# Threatened Species				Number of Single Site Spp.	Vulnerability KBA Score	Irreplaceability Score	Rank	Included in Minimum Critical Network	AZE Code
			CR	EN	VU	All						
IDN095	Feruhumpenai–Matano	Sulawesi	1	10	35	46	17	Extreme	Extreme	1	Yes	None
IDN073	Danau Poso	Sulawesi	5	5	11	21	16	Extreme	Extreme	1	Yes	None
IDN212	Manusela	Maluku	3	6	13	22	7	Extreme	Extreme	1	Yes	IDN13
IDN138	Karaeng–Lompobattang	Sulawesi	1	7	11	19	4	Extreme	Extreme	1	Yes	IDN6
IDN012	Gunung Sahendaruman	Sulawesi	5	3	3	11	4	Extreme	Extreme	1	Yes	IDN18
IDN288	Ruteng	Lesser Sunda	1	6	8	15	3	Extreme	Extreme	1	Yes	IDN22
IDN067	Lore Lindu	Sulawesi	4	9	29	42	2	Extreme	Extreme	1	Yes	None

KBA Code	KBA Name	Bio-region	# Threatened Species				Number of Single Site Spp.	Vulnerability KBA Score	Irreplaceability Score	Rank	Included in Minimum Critical Network	AZE Code
			CR	EN	VU	All						
IDN066	Pegunungan Tokalekaju	Sulawesi	2	4	19	25	2	Extreme	Extreme	1	Yes	None
IDN096	Danau Mahalona	Sulawesi	1	4	9	14	2	Extreme	Extreme	1	Yes	None
IDN029	Mahawu–Masarang	Sulawesi	1	2	10	13	2	Extreme	Extreme	1	Yes	None
IDN268	Manupeu Tanadaru	Lesser Sunda	1	1	9	11	2	Extreme	Extreme	1	Yes	None
IDN015	Pulau Siau	Sulawesi	2	2	1	5	2	Extreme	Extreme	1	Yes	IDN25
IDN089	Taliabu Utara	Sulawesi	1	1	2	4	2	Extreme	Extreme	1	Yes	IDN27
IDN027	Danau Tondano	Sulawesi	1	0	3	4	2	Extreme	Extreme	1	Yes	None
IDN074	Morowali	Sulawesi	1	8	16	25	1	Extreme	Extreme	1	Yes	IDN14
IDN192	Gunung Kepala Madang	Maluku	3	4	7	14	1	Extreme	Extreme	1	Yes	IDN5
IDN284	Mbeliling–Tanjung Kerita Mese	Lesser Sunda	2	6	5	13	1	Extreme	Extreme	1	Yes	None
IDN165	Aketajawe	Maluku	1	2	7	10	1	Extreme	Extreme	1	Yes	None
IDN145	Morotai	Maluku	1	1	8	10	1	Extreme	Extreme	1	Yes	None
IDN185	Gunung Batu Putih	Maluku	1	0	7	8	1	Extreme	Extreme	1	Yes	None
IDN093	Sanana	Sulawesi	1	2	0	3	1	Extreme	Extreme	1	Yes	IDN 24
IDN143	Pulau Tana Jampea	Sulawesi	1	1	1	3	1	Extreme	Extreme	1	Yes	IDN 28
IDN083	Kokolomboi	Sulawesi	1	0	1	2	1	Extreme	Extreme	1	Yes	None
IDN199	Pulau Buano	Maluku	1	0	1	2	1	Extreme	Extreme	1	Yes	IDN20
IDN097	Danau Towuti	Sulawesi	0	15	15	30	12	High	Extreme	2	Yes	None
IDN134	Bantimurung Bulusaraung	Sulawesi	0	5	16	21	6	High	Extreme	2	Yes	None
IDN129	Pegunungan Latimojong	Sulawesi	0	2	14	16	2	High	Extreme	2	Yes	None
IDN218	Kepulauan Banda	Maluku	0	2	1	3	2	High	Extreme	2	Yes	None
IDN336	Tanimbar Tengah	Lesser Sunda	0	3	4	7	1	High	Extreme	2	Yes	None
IDN078	Kepulauan Togean	Sulawesi	0	1	4	5	1	High	Extreme	2	Yes	None
IDN222	Pegunungan Daab– Boo	Maluku	0	3	1	4	1	High	Extreme	2	Yes	IDN9
IDN084	Bajomote — Pondipondi	Sulawesi	0	1	3	4	1	High	Extreme	2	Yes	None
IDN043	Molonggota	Sulawesi	0	2	1	3	1	High	Extreme	2	Yes	None
IDN037	Bogani Nani Wartabone	Sulawesi	2	5	28	35	0	Extreme	High	2	Yes	None
IDN022	Tangkoko Dua Sudara	Sulawesi	2	6	19	27	0	Extreme	High	2	No	None
IDN116	Lambusango	Sulawesi	1	2	17	20	0	Extreme	High	2	Yes	None
IDN231	Gunung Rinjani	Lesser Sunda	4	2	12	18	0	Extreme	High	2	Yes	None
IDN104	Rawa Aopa Watumohai	Sulawesi	2	3	13	18	0	Extreme	High	2	No	None
IDN052	Panua	Sulawesi	2	2	13	17	0	Extreme	High	2	No	None
IDN035	Gunung Ambang	Sulawesi	1	5	8	14	0	Extreme	High	2	No	None

KBA Code	KBA Name	Bio-region	# Threatened Species				Number of Single Site Spp.	Vulnerability KBA Score	Irreplaceability Score	Rank	Included in Minimum Critical Network	AZE Code
			CR	EN	VU	All						
IDN108	Tanjung Peropa	Sulawesi	1	4	9	14	0	Extreme	High	2	No	None
IDN115	Buton Utara	Sulawesi	1	2	11	14	0	Extreme	High	2	Yes	None
IDN285	Sesok	Lesser Sunda	2	5	5	12	0	Extreme	High	2	No	None
IDN205	Gunung Salahutu	Maluku	2	2	7	11	0	Extreme	High	2	No	None
IDN207	Leitimur	Maluku	2	2	7	11	0	Extreme	High	2	No	None
IDN126	Mambuliling	Sulawesi	1	3	7	11	0	Extreme	High	2	No	None
IDN153	Halmahera Timur	Maluku	1	2	8	11	0	Extreme	High	2	No	None
IDN025	Gunung Klabat	Sulawesi	1	0	10	11	0	Extreme	High	2	No	None
IDN241	Puncak Ngengas	Lesser Sunda	3	2	5	10	0	Extreme	High	2	No	None
IDN280	Komodo — Rinca	Lesser Sunda	2	3	4	9	0	Extreme	High	2	Yes	None
IDN080	Bakiriang	Sulawesi	1	3	5	9	0	Extreme	High	2	No	None
IDN057	Buol — Tolitoli	Sulawesi	1	3	5	9	0	Extreme	High	2	No	None
IDN058	Gunung Dako	Sulawesi	1	2	6	9	0	Extreme	High	2	No	None
IDN158	Gamkonora	Maluku	1	1	7	9	0	Extreme	High	2	No	None
TLS001	Nino Konis Santana	Lesser Sunda	2	0	6	8	0	Extreme	High	2	Yes	None
IDN345	Camplong	Lesser Sunda	1	2	5	8	0	Extreme	High	2	Yes	None
IDN227	Batu Gendang	Lesser Sunda	1	1	6	8	0	Extreme	High	2	No	None
IDN156	Kao	Maluku	1	0	6	7	0	Extreme	High	2	Yes	None
IDN283	Nggorang Bowosie	Lesser Sunda	2	3	1	6	0	Extreme	High	2	No	None
IDN346	Gunung Timau	Lesser Sunda	1	3	2	6	0	Extreme	High	2	No	None
IDN110	Tanjung Batikolo	Sulawesi	1	2	3	6	0	Extreme	High	2	No	None
IDN246	Gunung Tambora	Lesser Sunda	1	1	4	6	0	Extreme	High	2	No	None
IDN275	Laiwanggi Wanggameti	Lesser Sunda	1	1	4	6	0	Extreme	High	2	No	None
TLS010	Mundo Perdido	Lesser Sunda	1	2	2	5	0	Extreme	High	2	Yes	None
IDN031	Gunung Manembo-nembo	Sulawesi	1	0	4	5	0	Extreme	High	2	No	None
IDN124	Gunung Watusangia	Sulawesi	1	0	4	5	0	Extreme	High	2	No	None
IDN028	Soputan–Manimporok	Sulawesi	1	0	4	5	0	Extreme	High	2	No	None
IDN287	Todo Repok	Lesser Sunda	2	2	0	4	0	Extreme	High	2	No	None
IDN291	Nangarawa	Lesser Sunda	2	1	1	4	0	Extreme	High	2	No	None
IDN005	Pulau Salibabu	Sulawesi	1	2	1	4	0	Extreme	High	2	No	IDN23
IDN194	Danau Rana	Maluku	1	1	2	4	0	Extreme	High	2	Yes	None
IDN106	Nipa-nipa	Sulawesi	1	1	2	4	0	Extreme	High	2	No	None

KBA Code	KBA Name	Bio-region	# Threatened Species				Number of Single Site Spp.	Vulnerability KBA Score	Irreplaceability Score	Rank	Included in Minimum Critical Network	AZE Code
			CR	EN	VU	All						
TLS033	Tilomar	Lesser Sunda	1	1	2	4	0	Extreme	High	2	No	None
IDN282	Wae Wuul	Lesser Sunda	1	1	2	4	0	Extreme	High	2	No	None
IDN260	Yawila	Lesser Sunda	1	0	3	4	0	Extreme	High	2	No	None
IDN274	Yumbu–Kandara	Lesser Sunda	1	0	3	4	0	Extreme	High	2	No	None
IDN352	Rote Utara	Lesser Sunda	2	1	0	3	0	Extreme	High	2	No	IDN21
IDN350	Semau	Lesser Sunda	2	1	0	3	0	Extreme	High	2	No	None
IDN317	Gunung Muna	Lesser Sunda	1	1	1	3	0	Extreme	High	2	No	None
IDN038	Tanjung Binerean	Sulawesi	1	1	1	3	0	Extreme	High	2	No	None
IDN184	Wayaloar	Maluku	1	1	1	3	0	Extreme	High	2	No	None
IDN294	Wolo Tado	Lesser Sunda	1	1	1	3	0	Extreme	High	2	No	None
IDN306	Gunung Lewotobi	Lesser Sunda	1	0	2	3	0	Extreme	High	2	No	None
IDN279	Luku Melolo	Lesser Sunda	1	0	2	3	0	Extreme	High	2	No	None
IDN315	Pantar	Lesser Sunda	1	0	2	3	0	Extreme	High	2	No	None
IDN053	Popayato–Paguat	Sulawesi	1	0	2	3	0	Extreme	High	2	No	None
IDN262	Poronumbu	Lesser Sunda	1	0	2	3	0	Extreme	High	2	No	None
IDN273	Praipaha Mandahu	Lesser Sunda	1	0	2	3	0	Extreme	High	2	No	None
IDN277	Tanjung Ngunju	Lesser Sunda	1	0	2	3	0	Extreme	High	2	No	None
IDN347	Bipolo	Lesser Sunda	1	1	0	2	0	Extreme	High	2	No	None
IDN342	Buat–Soe	Lesser Sunda	1	1	0	2	0	Extreme	High	2	No	None
TLS035	Citrana	Lesser Sunda	1	1	0	2	0	Extreme	High	2	No	None
IDN050	Dulamayo	Sulawesi	1	1	0	2	0	Extreme	High	2	No	None
IDN010	Gunung Awu	Sulawesi	1	1	0	2	0	Extreme	High	2	No	None
IDN343	Oenasi	Lesser Sunda	1	1	0	2	0	Extreme	High	2	No	None
IDN011	Tahuna	Sulawesi	1	1	0	2	0	Extreme	High	2	No	None
IDN266	Baliledo	Lesser Sunda	1	0	1	2	0	Extreme	High	2	No	None
IDN091	Buya	Sulawesi	1	0	1	2	0	Extreme	High	2	No	None
IDN092	Loku	Sulawesi	1	0	1	2	0	Extreme	High	2	No	None
IDN353	Danau Peto	Lesser Sunda	1	0	0	1	0	Extreme	High	2	No	IDN21
IDN034	Gunung Sinonsayang	Sulawesi	1	0	0	1	0	Extreme	High	2	No	None
IDN130	Danau Tempe	Sulawesi	0	0	7	7	2	Medium	Extreme	3	Yes	None

KBA Code	KBA Name	Bio-region	# Threatened Species				Number of Single Site Spp.	Vulnerability KBA Score	Irreplaceability Score	Rank	Included in Minimum Critical Network	AZE Code
			CR	EN	VU	All						
IDN172	Yaba	Maluku	0	0	3	3	2	Medium	Extreme	3	Yes	None
IDN075	Gunung Lumut	Sulawesi	0	0	3	3	1	Medium	Extreme	3	Yes	None
IDN140	Pulau Selayar	Sulawesi	0	0	2	2	1	Medium	Extreme	3	Yes	None
IDN101	Mekongga	Sulawesi	0	2	14	16	0	High	High	3	No	None
IDN003	Karakelang Utara	Sulawesi	0	6	6	12	0	High	High	3	Yes	IDN 10
IDN098	Routa	Sulawesi	0	2	10	12	0	High	High	3	No	None
IDN004	Karakelang Selatan	Sulawesi	0	6	4	10	0	High	High	3	No	IDN10
IDN049	Nantu	Sulawesi	0	1	8	9	0	High	High	3	No	None
IDN127	Mamuju	Sulawesi	0	1	6	7	0	High	High	3	No	None
IDN086	Balantak	Sulawesi	0	3	3	6	0	High	High	3	No	None
IDN178	Gunung Sibela	Maluku	0	2	4	6	0	High	High	3	No	None
IDN163	Ternate	Maluku	0	1	5	6	0	High	High	3	Yes	None
IDN195	Leksula	Maluku	0	2	3	5	0	High	High	3	No	None
IDN213	Waebula	Maluku	0	2	3	5	0	High	High	3	No	None
IDN036	Gunung Simbalang	Sulawesi	0	1	4	5	0	High	High	3	No	None
IDN298	Kelimutu	Lesser Sunda	0	1	4	5	0	High	High	3	No	None
IDN135	Bulurokeng	Sulawesi	0	1	3	4	0	High	High	3	No	None
IDN054	Gunung Ile-ile	Sulawesi	0	1	3	4	0	High	High	3	No	None
IDN341	Gunung Mutis	Lesser Sunda	0	1	3	4	0	High	High	3	No	None
IDN164	Tidore	Maluku	0	1	3	4	0	High	High	3	No	None
IDN237	Tatar Sepang	Lesser Sunda	2	0	1	3	0	Extreme	Medium	3	No	None
IDN072	Pambuang	Sulawesi	1	2	0	3	0	Extreme	Medium	3	No	None
IDN242	Dodo Jaranpusang	Lesser Sunda	1	0	2	3	0	Extreme	Medium	3	No	None
IDN019	Likupang	Sulawesi	1	0	2	3	0	Extreme	Medium	3	No	None
TLS029	Maubara	Lesser Sunda	1	0	2	3	0	Extreme	Medium	3	No	None
TLS017	Monte Mak Fahik–Sarim	Lesser Sunda	1	0	2	3	0	Extreme	Medium	3	No	None
IDN244	Pulau Moyo	Lesser Sunda	1	0	2	3	0	Extreme	Medium	3	No	None
IDN289	Gapong	Lesser Sunda	0	2	1	3	0	High	High	3	No	None
IDN292	Gunung Inerie	Lesser Sunda	0	2	1	3	0	High	High	3	No	None
IDN211	Saparua	Maluku	0	2	1	3	0	High	High	3	No	None
IDN234	Bumbang	Lesser Sunda	0	1	2	3	0	High	High	3	No	None
IDN186	Cabang Kuning	Maluku	0	1	2	3	0	High	High	3	Yes	None
IDN304	Egon Ilimedo	Lesser Sunda	0	1	2	3	0	High	High	3	No	None
IDN204	Pegunungan	Maluku	0	1	2	3	0	High	High	3	No	None

KBA Code	KBA Name	Bio-region	# Threatened Species				Number of Single Site Spp.	Vulnerability KBA Score	Irreplaceability Score	Rank	Included in Minimum Critical Network	AZE Code
			CR	EN	VU	All						
	Paunusa											
IDN202	Tullen Batae	Maluku	0	1	2	3	0	High	High	3	No	None
IDN322	Kunggwera	Lesser Sunda	2	0	0	2	0	Extreme	Medium	3	No	None
IDN319	Mainang	Lesser Sunda	2	0	0	2	0	Extreme	Medium	3	No	None
IDN321	Tuti Adagae	Lesser Sunda	2	0	0	2	0	Extreme	Medium	3	No	None
IDN064	Pasoso	Sulawesi	1	1	0	2	0	Extreme	Medium	3	No	None
IDN069	Tambu	Sulawesi	1	1	0	2	0	Extreme	Medium	3	No	None
IDN120	Wakatobi	Sulawesi	1	1	0	2	0	Extreme	Medium	3	No	None
TLS032	Be Malae	Lesser Sunda	1	0	1	2	0	Extreme	Medium	3	No	None
IDN258	Cambaka	Lesser Sunda	1	0	1	2	0	Extreme	Medium	3	No	None
IDN259	Danggamangu	Lesser Sunda	1	0	1	2	0	Extreme	Medium	3	No	None
IDN248	Empang	Lesser Sunda	1	0	1	2	0	Extreme	Medium	3	No	None
TLS007	Irabere–Iliomar	Lesser Sunda	1	0	1	2	0	Extreme	Medium	3	No	None
IDN264	Kaliasin	Lesser Sunda	1	0	1	2	0	Extreme	Medium	3	No	None
IDN261	Lamboya	Lesser Sunda	1	0	1	2	0	Extreme	Medium	3	No	None
IDN179	Mandioli	Maluku	1	0	1	2	0	Extreme	Medium	3	No	None
IDN344	Manipo	Lesser Sunda	1	0	1	2	0	Extreme	Medium	3	No	None
TLS015	Monte Aitana–Bibileo	Lesser Sunda	1	0	1	2	0	Extreme	Medium	3	No	None
TLS016	Monte Diatuto	Lesser Sunda	1	0	1	2	0	Extreme	Medium	3	No	None
TLS006	Monte Matebian	Lesser Sunda	1	0	1	2	0	Extreme	Medium	3	No	None
IDN109	Pulau Wawonii	Sulawesi	1	0	1	2	0	Extreme	Medium	3	No	None
IDN257	Rokoraka–Matalombu	Lesser Sunda	1	0	1	2	0	Extreme	Medium	3	No	None
IDN325	Danau Tihu	Lesser Sunda	0	2	0	2	0	High	High	3	No	None
IDN324	Gunung Arnau	Lesser Sunda	0	2	0	2	0	High	High	3	No	None
IDN137	Komara	Sulawesi	0	1	1	2	0	High	High	3	No	None
IDN297	Mausambi	Lesser Sunda	0	1	1	2	0	High	High	3	No	None
TLS020	Monte Tatamailau	Lesser Sunda	0	1	1	2	0	High	High	3	No	None
IDN007	Pulau Kabaruan	Sulawesi	0	1	1	2	0	High	High	3	No	None
IDN062	Siraro	Sulawesi	0	1	1	2	0	High	High	3	No	None
TLS022	Areia Branca no Dolok Oan	Lesser Sunda	1	0	0	1	0	Extreme	Medium	3	No	None

KBA Code	KBA Name	Bio-region	# Threatened Species				Number of Single Site Spp.	Vulnerability KBA Score	Irreplaceability Score	Rank	Included in Minimum Critical Network	AZE Code
			CR	EN	VU	All						
TLS028	Fatumasin	Lesser Sunda	1	0	0	1	0	Extreme	Medium	3	No	None
IDN272	Lai Kayambi	Lesser Sunda	1	0	0	1	0	Extreme	Medium	3	No	None
IDN308	Larantuka	Lesser Sunda	1	0	0	1	0	Extreme	Medium	3	No	None
TLS005	Legumau	Lesser Sunda	1	0	0	1	0	Extreme	Medium	3	No	None
TLS021	Leimia Kraik	Lesser Sunda	1	0	0	1	0	Extreme	Medium	3	No	None
IDN265	Lokusobak	Lesser Sunda	1	0	0	1	0	Extreme	Medium	3	No	None
IDN048	Muara Paguyaman Pantai	Sulawesi	1	0	0	1	0	Extreme	Medium	3	No	None
IDN123	Pulau Kadatua	Sulawesi	1	0	0	1	0	Extreme	Medium	3	No	None
IDN144	Pulau Kalatoa	Sulawesi	1	0	0	1	0	Extreme	Medium	3	No	None
TLS018	Sungai Klere	Lesser Sunda	1	0	0	1	0	Extreme	Medium	3	No	None
TLS024	Atauro Island	Lesser Sunda	0	1	0	1	0	High	High	3	No	None
IDN305	Ili Wengot	Lesser Sunda	0	1	0	1	0	High	High	3	No	None
IDN340	Kateri–Maubesi	Lesser Sunda	0	1	0	1	0	High	High	3	No	None
IDN323	Pulau Redong	Lesser Sunda	0	1	0	1	0	High	High	3	No	None
IDN061	Gunung Sojol	Sulawesi	0	0	8	8	0	Medium	High	4	No	None
IDN114	Muna Timur	Sulawesi	0	0	6	6	0	Medium	High	4	No	None
IDN167	Dote–Kobe	Maluku	0	0	4	4	0	Medium	High	4	No	None
IDN160	Tanah Putih	Maluku	0	0	4	4	0	Medium	High	4	No	None
IDN210	Haruku	Maluku	0	0	3	3	0	Medium	High	4	No	None
IDN267	Pahudu Tilu	Lesser Sunda	0	0	3	3	0	Medium	High	4	No	None
IDN170	Pulau Kayoa	Maluku	0	0	3	3	0	Medium	High	4	No	None
IDN042	Puncak Botu	Sulawesi	0	0	3	3	0	Medium	High	4	No	None
IDN055	Tanjung Panjang	Sulawesi	0	1	1	2	0	High	Medium	4	No	None
IDN183	Danau Manis	Maluku	0	0	2	2	0	Medium	High	4	No	None
IDN149	Galela	Maluku	0	0	2	2	0	Medium	High	4	No	None
IDN030	Gunung Lokon	Sulawesi	0	0	2	2	0	Medium	High	4	No	None
IDN200	Gunung Sahuwai	Maluku	0	0	2	2	0	Medium	High	4	No	None
IDN060	Gunung Tinombala	Sulawesi	0	0	2	2	0	Medium	High	4	No	None
IDN099	Lamiko-miko	Sulawesi	0	0	2	2	0	Medium	High	4	No	None
IDN313	Lembata	Lesser Sunda	0	0	2	2	0	Medium	High	4	No	None
IDN161	Rawa Sagu Ake Jailolo	Maluku	0	0	2	2	0	Medium	High	4	No	None
IDN085	Timbong	Sulawesi	0	0	2	2	0	Medium	High	4	No	None

KBA Code	KBA Name	Bio-region	# Threatened Species				Number of Single Site Spp.	Vulnerability KBA Score	Irreplaceability Score	Rank	Included in Minimum Critical Network	AZE Code
			CR	EN	VU	All						
IDN047	Tangale*	Sulawesi	0	0	2	2	0	Medium	High	4	No	None
IDN071	Lariang	Sulawesi	0	1	0	1	0	High	Medium	4	No	None
IDN041	Milangodaa	Sulawesi	0	1	0	1	0	High	Medium	4	No	None
IDN154	Hutan Bakau Dodaga	Maluku	0	0	1	1	0	Medium	High	4	No	None
IDN220	Kepulauan Tayandu	Maluku	0	0	1	1	0	Medium	High	4	No	None
IDN082	Labobo — Bangkurung	Sulawesi	0	0	1	1	0	Medium	High	4	No	IDN 19
IDN286	Nangalili	Lesser Sunda	0	0	1	1	0	Medium	High	4	No	None
IDN290	Pota	Lesser Sunda	0	0	1	1	0	Medium	High	4	No	None
IDN296	Pulau Ontoloe	Lesser Sunda	0	0	1	1	0	Medium	High	4	No	None
IDN088	Pulau Seho	Sulawesi	0	0	1	1	0	Medium	High	4	No	None
IDN174	Saketa	Maluku	0	0	1	1	0	Medium	High	4	No	None
IDN300	Tanjung Watu Mana	Lesser Sunda	0	0	1	1	0	Medium	High	4	No	None
IDN309	Tanjung Watupayung	Lesser Sunda	0	0	1	1	0	Medium	High	4	No	None
IDN271	Tarimbang	Lesser Sunda	0	0	1	1	0	Medium	High	4	No	None
IDN196	Teluk Kayeli	Maluku	0	0	1	1	0	Medium	High	4	No	None
IDN076	Tanjung Colo*	Sulawesi	0	1	0	1	0	High	Medium	4	No	None
IDN046	Mas Popaya Raja*	Sulawesi	0	0	1	1	0	Medium	High	4	No	None
IDN024	Lembeh	Sulawesi	0	0	3	3	0	Medium	Medium	5	No	None
IDN173	Gorogoro	Maluku	0	0	2	2	0	Medium	Medium	5	No	None
IDN150	Gunung Dukono	Maluku	0	0	2	2	0	Medium	Medium	5	No	None
IDN171	Kasiruta	Maluku	0	0	2	2	0	Medium	Medium	5	No	None
TLS014	Laleia	Lesser Sunda	0	0	2	2	0	Medium	Medium	5	No	None
IDN147	Pulau Rao	Maluku	0	0	2	2	0	Medium	Medium	5	No	None
IDN177	Tutupa	Maluku	0	0	2	2	0	Medium	Medium	5	No	None
IDN293	Aegela	Lesser Sunda	0	0	1	1	0	Medium	Medium	5	No	None
IDN133	Cani Sirenreng	Sulawesi	0	0	1	1	0	Medium	Medium	5	No	None
IDN312	Lamalera	Lesser Sunda	0	0	1	1	0	Medium	Medium	5	No	None
IDN201	Luhu	Maluku	0	0	1	1	0	Medium	Medium	5	No	None
IDN182	Obilatu	Maluku	0	0	1	1	0	Medium	Medium	5	No	None
IDN303	Pulau Besar	Lesser Sunda	0	0	1	1	0	Medium	Medium	5	No	None
IDN203	Pulau Kassa	Maluku	0	0	1	1	0	Medium	Medium	5	No	None
IDN188	Pulau Obit	Maluku	0	0	1	1	0	Medium	Medium	5	No	None
TLS013	Subaun	Lesser Sunda	0	0	1	1	0	Medium	Medium	5	No	None

KBA Code	KBA Name	Bio-region	# Threatened Species				Number of Single Site Spp.	Vulnerability KBA Score	Irreplaceability Score	Rank	Included in Minimum Critical Network	AZE Code
			CR	EN	VU	All						
IDN214	Tanah Besar	Maluku	0	0	1	1	0	Medium	Medium	5	No	None
IDN193	Waemala	Maluku	0	0	1	1	0	Medium	Medium	5	No	None
TLS027	Tasitolu	Lesser Sunda	0	0	3	3	0	Medium	Low	6	No	None
IDN235	Sekaroh*	Lesser Sunda	0	0	2	2	0	Medium	Low	6	No	None
IDN238	Taliwang	Lesser Sunda	0	0	2	2	0	Medium	Low	6	No	None
IDN118	Ambuau*	Sulawesi	0	0	1	1	0	Medium	Low	6	No	None
IDN111	Baito–Wolasi*	Sulawesi	0	0	1	1	0	Medium	Low	6	No	None
IDN103	Lamadae*	Sulawesi	0	0	1	1	0	Medium	Low	6	No	None
IDN021	Mawori*	Sulawesi	0	0	1	1	0	Medium	Low	6	No	None
TLS009	Monte Builo	Lesser Sunda	0	0	1	1	0	Medium	Low	6	No	None
TLS003	Nari	Lesser Sunda	0	0	1	1	0	Medium	Low	6	No	None
IDN131	Pallime*	Sulawesi	0	0	1	1	0	Medium	Low	6	No	None
IDN356	Pulau Dana	Lesser Sunda	0	0	1	1	0	Medium	Low	6	No	None
IDN349	Teluk Kupang*	Lesser Sunda	1	0	1	2	0	low	Low	7	No	None
IDN329	Kepulauan Lemola*	Lesser Sunda	0	0	0	0	0	low	Low	7	No	None
IDN334	Pulau Babar*	Lesser Sunda	0	0	0	0	0	low	Low	7	No	None
IDN332	Pulau Damar*	Lesser Sunda	0	0	0	0	0	low	Low	7	No	None
IDN226	Pulau Gunung Api*	Maluku	0	0	0	0	0	low	Low	7	No	None
IDN338	Pulau Larat*	Lesser Sunda	0	0	0	0	0	low	Low	7	No	None
IDN223	Pulau Manuk*	Maluku	0	0	0	0	0	low	Low	7	No	None
IDN327	Pulau Romang*	Lesser Sunda	0	0	0	0	0	low	Low	7	No	None

*Notes on Table A5.3:

IDN349	Teluk Kupang	Site has >1% of the population of Australian practincole *Stiltia isabella* and Broad-Billed Sandpiper *Limicola falcinellus*, so is scored for this rather than the record of Fregatta andrewsi (CR)
IDN076	Tanjung Colo	Site is of marginal significance for Maleo *M. maleo*
IDN235	Sekaroh	Site is of marginal significance for Milky Stork *Mycteria cinerea*
IDN047	Tangale	Site is of marginal significance for Heck's Macaque *Macaca hecki*
IDN118	Ambuau	Site is of marginal significance for Milky Stork *Mycteria cinerea*
IDN111	Baito — Wolasi	Site is of marginal significance for Milky Stork *Mycteria cinerea*
IDN103	Lamadae	site is of unknown important for the Nantu tree *Pericopsis mooniana*
IDN046	Mas Popaya Raja	Site is of marginal significance for Heck's Macaque *Macaca hecki*
IDN021	Mawori	Site is of marginal significance for Chinese Egret *Egretta eulophotes*
IDN131	Pallime	Site is of marginal significance for Milky Stork *Mycteria cinerea*

IDN329	Kepulauan Lemola	No globally threatened species, KBA identified for restricted range birds
IDN334	Pulau Babar	No globally threatened species, KBA identified for restricted range birds
IDN332	Pulau Damar	No globally threatened species, KBA identified for restricted range birds
IDN226	Pulau Gunung Api	No globally threatened species, KBA identified for significant concentration of seabirds
IDN338	Pulau Larat	No globally threatened species, KBA identified for restricted range birds
IDN223	Pulau Manuk	No globally threatened species, KBA identified for significant concentration of seabirds
IDN327	Pulau Romang	No globally threatened species, KBA identified for restricted range birds

Appendix 4. Corridors

Table A4.1. Terrestrial Corridors

#	Corridor Name	Province / Country	Area (Ha)	KBA	KBA Connectivity	Ecosystem Services	Priority for CEPF Funding
1	Halma-Hera	North Maluku	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.	Yes
2	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	Local importance only	Partially (seram)
3	Sumba	East Nusa Tenggara	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.	No
4	Sum-bawa-Lombok	West Nusa Tenggara	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.	No
5	Timor-Wetar	West Nusa Tenggara –Timor-Leste	1,902,524	IDN324, IDN325, IDN340, IDN341, IDN342, IDN343, IDN344, IDN345, IDN346, IDN347, IDN349, IDN350, IDN352, IDN353, TLS001, TLS003, TLS005, TLS006, TLS007, TLS009, TLS010, TLS013, TLS014, TLS015, TLS016, TLS017, TLS018, TLS020, TLS021, TLS022, TLS024, TLS027,	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.	Partially (Timor-Leste)

#	Corridor Name	Province / Country	Area (Ha)	KBA	KBA Connectivity	Ecosystem Services	Priority for CEPF Funding
				TLS028, TLS029, TLS032, TLS033, TLS035			
6	Flores Forests	East Nusa Tenggara	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.	Yes
7	Flores Coast	East Nusa Tenggara	179,880	IDN280, IDN282, IDN283, IDN284, IDN286, IDN290, IDN294, IDN296, IDN297, IDN300, IDN304	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.	Yes
8	North Sulawesi	North Sulawesi, Gorontalo	1,279,252	IDN019, IDN022, IDN025, IDN027, IDN028, IDN029, IDN030, IDN031, IDN034, IDN035, IDN036, IDN037, IDN038, IDN041, IDN042, IDN043, IDN048, IDN049, IDN050, IDN052, IDN053, IDN054, IDN055, IDN057, IDN058, IDN060, IDN061, IDN062	Some forest corridors still connect KBAs in the uplands of N Sulawesi and Gorontalo Ridge-to-reef potential limited, coastal strip has been developed	Short rivers and small catchments make catchment forests Important for maintenance of water supplies to urban centres (including Manado) and flood control.	Partially (Sangihe-Talaud islands)

#	Corridor Name	Province / Country	Area (Ha)	KBA	KBA Connectivity	Ecosystem Services	Priority for CEPF Funding
9	Central Sulawesi	West Sulawesi, Central Sulawesi, South Sulawesi, South-east Sulawesi	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 (26)	Significant forest corridors remain in the region. Ridge to reef potential limited	Catchment management is critical for the conservation of the central Sulawesi lake KBAs. The Lore Lindu catchment provdes water to Palu and other urban centres.	Partially (Lake Poso, Malili Lakes)
10	Southern Sulawesi	South Sulawesi	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.	Yes

Table A3.2: Marine Corridors

#	Corridor Name	Province /country	Area (Ha)	KBAs	# of Globally Threatened Species with Confirmed Records	Total possible # of Globally Threatened Species (including hypothetical	Priority for CEPF Funding
1	Banda Seascape	Maluku	2,083,642	IDN217, IDN224	76	298	No
2	Buru Seascape	Maluku	2,205,626	IDN191, IDN197, IDN198, IDN206, IDN208	1	224	No
3	Halmahera Seascape	North Maluku	2,655,562	IDN146, DN148, IDN151, IDN152, IDN155, IDN157, IDN159, IDN162, IDN166, IDN168, IDN169, IDN175, IDN176, IDN180, IDN190	152	388	Yes
4	Inner Banda Arc	Maluku	2,562,236	IDN326, IDN331		221	No
5	Komodo–Sumba Strait	East Nusa Tenggara	777,626	IDN251, IDN252, IDN253, IDN254, IDN255, IDN281	5	228	No
6	Lombok Strait*	West Nusa Tenggara	267,712	IDN228, IDN229, IDN230	4	229	No
7	Lucipara Seascape	Maluku	1,917,943	IDN225	1	220	No
8	North Sulawesi	North Sulawesi	6,011,907	IDN001, IDN002, IDN006, IDN008, IDN009, IDN013, IDN014, IDN016, IDN017, IDN018, IDN020, IDN023, IDN026, IDN032, IDN033	140	377	Yes
9	Outer Banda Arc	Maluku	5,865,732	IDN216, IDN219, IDN221, IDN328, IDN330, IDN333, IDN335, IDN337, IDN339	5	231	No
10	Sawu Sea	East Nusa Tenggara	2,581,868	IDN256, IDN263, IDN269, IDN270, IDN276, IDN278, IDN348, IDN351, IDN354, IDN355	4	231	No
11	Solor–Alor	East Nusa Tenggara	3,071,220	IDN307, IDN310, IDN311, IDN314, IDN316, IDN318, IDN320	2	227	Yes
12	Sulawesi Sea*	North Sulawesi, Gorontalo	6,621,497	None	0	30	No
13	Timor Trench	Timor-Leste	912,028	None	0	24	No
14	Timor-Leste Seascape	Timor-Leste	543,663	TLS002, TLS004, TLS008, TLS011, TLS012, TLS019, TLS023, TLS025, TLS026, TLS030, TLS031, TLS034	89	313	Yes
15	Togean–Banggai	Central Sulawesi	1,936,969	IDN077, IDN079, IDN081, IDN087	4	231	Yes
16	West Central Sulawesi	West Sulawesi, North Sulawesi	2,381,791	IDN059, IDN063, IDN065, IDN068	2	229	No

Appendix 5. List of Protected Areas

5.1 Protected Areas in Indonesian Wallacea

Province	Protected Areas Name	Designation	Area (ha)	KBA Name	Code
Gorontalo	CA Mas Popaya Raja	Nature Reserve	160	Mas Popaya Raja	IDN046
Gorontalo	CA Panua	Nature Reserve	49,908	Panua	IDN052
Gorontalo	CA Tangale	Nature Reserve	1,133	Tangale	IDN047
Gorontalo	CA Tanjung Panjang	Nature Reserve	7,434	Tanjung Panjang	IDN055
Gorontalo	SM Nantu	Wildlife Reserve	34,032	Nantu	IDN049
Gorontalo	TN Bogani Nani Wartabone	National Park	277,481	Bogani Nani Wartabone	IDN037
Maluku	CA Bekau Huhun	Nature Reserve	45,419	Gunung Arnau	IDN324
Maluku	CA Daab	Nature Reserve	15,408	Pegunungan Daab–Boo	IDN222
Maluku	CA Gunung Api Kisar	Nature Reserve	79	Pulau Gunung Api	IDN226
Maluku	CA Gunung Sahuwai	Nature Reserve	16,524	Gunung Sahuwai	IDN200
Maluku	CA Masbait	Nature Reserve	5,989		
Maluku	CA Pulau Angwarmase	Nature Reserve	761		
Maluku	CA Pulau Larat	Nature Reserve	3,750	Pulau Larat	IDN338
Maluku	CA Pulau Nustaram	Nature Reserve	66,993	Tanimbar Tengah	IDN336
Maluku	CA Pulau Nuswotar	Nature Reserve	3,578		
Maluku	CA Pulau Pombo	Nature Reserve	4,941	Luhu	IDN201
Maluku	CA Tafermaar	Nature Reserve	3,078		
Maluku	SM Pulau Manuk	Wildlife Reserve	595	Pulau Manuk	IDN223
Maluku	TN Manusela	National Park	157,745	Manusela	IDN212
Maluku	TWA Gunung Api Banda	Nature Tourism Park	690	Kepulauan Banda	IDN218
Maluku	TWAL Pulau Kassa	Marine Nature Tourism Park		Pulau Kassa	IDN203
Maluku	TWAL Pulau Marsegu	Marine Nature Tourism Park		Kelang–Kassa–Buano–Marsegu	IDN198
North Maluku	CA Gunung Sibela	Nature Reserve	20,942	Gunung Sibela	IDN178
North Maluku	CA Lifamatola	Nature Reserve	1,902	Pulau Lifamatola	IDN094
North Maluku	CA Pulau Seho	Nature Reserve	1,088	Pulau Seho	IDN088
North Maluku	CA Taliabu	Nature Reserve	8,006	Taliabu Utara	IDN089
North Maluku	CA Tobalai	Nature Reserve	3,985	Pulau Obit	IDN189
North Maluku	TN Aketajawe Lolobata	National Park	203,256	Aketajawe, Halmahera Timur	IDN165, IDN 153

Province	Protected Areas Name	Designation	Area (ha)	KBA Name	Code
West Nusa Tenggara	CA Gunung Tambora Selatan	Nature Reserve	24,552	Gunung Tambora	IDN246
West Nusa Tenggara	CA Jereweh (Sekongkang)	Nature Reserve	7,218	Tatar Sepang	IDN237
West Nusa Tenggara	CA Pedauh	Nature Reserve	976	Tatar Sepang	IDN237
West Nusa Tenggara	CA Pulau Panjang	Nature Reserve	12,521	Pulau Panjang	IDN240
West Nusa Tenggara	CA Pulau Sangiang	Nature Reserve	7,006		
West Nusa Tenggara	CA Toffo Kota Lambu	Nature Reserve	4,032		
West Nusa Tenggara	SM Gunung Tambora Selatan	Wildlife Reserve	15,628	Gunung Tambora	IDN246
West Nusa Tenggara	TB Gunung Tambora Selatan	Hunting Reserve	13,469	Gunung Tambora	IDN246
West Nusa Tenggara	TB Pulau Moyo	Hunting Reserve	28,630	Pulau Moyo	IDN244
West Nusa Tenggara	THR Nuraksa	Forest Park	211	Gunung Rinjani	IDN231
West Nusa Tenggara	TN Gunung Rinjani	National Park	34,384	Gunung Rinjani	IDN231
West Nusa Tenggara	TWA Bangko-bangko	Nature Tourism Park	2,348		
West Nusa Tenggara	TWA Danau Rawa Taliwang	Nature Tourism Park	1,162	Taliwang	IDN238
West Nusa Tenggara	TWA Gunung Tunak	Nature Tourism Park	1,860	Bumbang	IDN234
West Nusa Tenggara	TWA Kerandangan	Nature Tourism Park	758	Gunung Rinjani	IDN231
West Nusa Tenggara	TWA Madapangga	Nature Tourism Park	1,793		
West Nusa Tenggara	TWA Pelangan	Nature Tourism Park	417	Batu Gendang	IDN227
West Nusa Tenggara	TWA Semongkat	Nature Tourism Park	539	Puncak Ngengas	IDN241
West Nusa Tenggara	TWA Suranadi	Nature Tourism Park	65		
West Nusa Tenggara	TWA Tanjung Tampa	Nature Tourism Park	1,131	Perairan Bumbang	IDN233
West Nusa Tenggara	TWAL Gili Ayer Gili Meno Gili Trawangan (Gili Matr	Marine Nature Tourism Park		Gili Ayer–Meno–Trawangan	IDN230

Province	Protected Areas Name	Designation	Area (ha)	KBA Name	Code
West Nusa Tenggara	TWAL Pulau Moyo	Marine Nature Tourism Park		Perairan Pulau Moyo	IDN243
West Nusa Tenggara	TWAL Pulau Satonda	Marine Nature Tourism Park		Perairan Pulau Satonda	IDN245
East Nusa Tenggara	CA Gunung Mutis	Nature Reserve	14,163	Gunung Mutis	IDN341
East Nusa Tenggara	CA Maubesi (RTK 189)	Nature Reserve	6,322	Kateri — Maubesi	IDN340
East Nusa Tenggara	CA Tambora	Nature Reserve	950	Mausambi	IDN297
East Nusa Tenggara	CA Wae Wuul	Nature Reserve	1,326	Wae Wuul	IDN282
East Nusa Tenggara	CA Watu Ata	Nature Reserve	5,225	Gunung Inerie	IDN292
East Nusa Tenggara	CA Wolo Tadho	Nature Reserve	5,403	Wolo Tado	IDN294
East Nusa Tenggara	CAL Riung	Marine Nature Reserve	88		
East Nusa Tenggara	SM Ale Aisio (RTK 198)	Wildlife Reserve	5,827	Manipo	IDN344
East Nusa Tenggara	SM Danau Tuadale	Wildlife Reserve	782		
East Nusa Tenggara	SM Harlu	Wildlife Reserve	530	Rote Utara	IDN352
East Nusa Tenggara	SM Kateri (RTK 77)	Wildlife Reserve	4,729	Kateri–Maubesi	IDN340
East Nusa Tenggara	SM Perhatu	Wildlife Reserve	506	Semau	IDN350
East Nusa Tenggara	TB Dataran Bena (Rtk 190)	Hunting Reserve	2,873	Manipo	IDN344
East Nusa Tenggara	TB Pulau Ndana	Hunting Reserve	1,435		
East Nusa Tenggara	THR Prof. Ir. Herman Johannes	Forest Park	7,392		
East Nusa Tenggara	TN Kelimutu	National Park	5,317	Kelimutu	IDN298
East Nusa Tenggara	TN Komodo	National Park	179,340	Komodo–Rinca, Perairan Komodo–Rinca	IDN280, IDN 281
East Nusa Tenggara	TN Laiwangi Wanggameti	National Park	39,555	Laiwanggi Wanggameti	IDN275
East Nusa Tenggara	TN Manupeu Tanadaru	National Park	69,104	Manupeu Tanadaru	IDN268
East Nusa Tenggara	TWA Baumata	Nature Tourism Park	776		
East Nusa Tenggara	TWA Bipolo	Nature Tourism Park	433	Bipolo	IDN347
East Nusa Tenggara	TWA Camplong (RTK 12)	Nature Tourism Park	780	Camplong	IDN345
East Nusa Tenggara	TWA Egon ilimedo	Nature Tourism Park	1,664	Egon Ilimedo	IDN304
East Nusa Tenggara	TWA Kemang Beleng	Nature Tourism Park	956		
East Nusa Tenggara	TWA Pulau Batang	Nature Tourism Park	369		
East Nusa Tenggara	TWA Pulau Besar	Nature Tourism Park	5,287	Pulau Besar	IDN303
East Nusa Tenggara	TWA Pulau Lapang	Nature Tourism Park	257		
East Nusa Tenggara	TWA Pulau Manipo	Nature Tourism Park	3,036	Manipo	IDN344
East Nusa Tenggara	TWA Pulau Rusa	Nature Tourism Park	1,396		

Province	Protected Areas Name	Designation	Area (ha)	KBA Name	Code
East Nusa Tenggara	TWA Ruteng	Nature Tourism Park	36,025	Ruteng	IDN288
East Nusa Tenggara	TWA Tuti Adagae	Nature Tourism Park	12,782	Tuti Adagae	IDN321
East Nusa Tenggara	TWAL Gugus Pulau Teluk Maumere	Marine Nature Tourism Park		Teluk Maumere	IDN302
East Nusa Tenggara	TWAL Teluk Kupang	Marine Nature Tourism Park			
East Nusa Tenggara	TWAL Tujuh Belas Pulau Riung	Marine Nature Tourism Park		Riung 17 Pulau, Pulau Ontoloe	IDN295, IDN 296
West Sulawesi	SM Lampoko dan Mampie	Wildlife Reserve	1,286		
South Sulawesi	CA Faruhumpenai	Nature Reserve	90,567	Feruhumpenai–Matano	IDN095
South Sulawesi	CA Kalaena	Nature Reserve	104	Feruhumpenai–Matano	IDN095
South Sulawesi	CA Pamona	Nature Reserve	24,459	Danau Poso	IDN073
South Sulawesi	CA Ponda-ponda	Nature Reserve	77	Feruhumpenai–Matano	IDN095
South Sulawesi	SM Komara	Wildlife Reserve	4,004	Komara	IDN137
South Sulawesi	TB Komara	Hunting Reserve	2,709	Komara	IDN137
South Sulawesi	THR Bontobahari	Forest Park	3,509		
South Sulawesi	THR Sinjai	Forest Park	773	Karaeng–Lompobattang	IDN138
South Sulawesi	TN Bantimurung Bulusaraung	National Park	43,531	Bantimurung Bulusaraung	IDN134
South Sulawesi	TNL Taka Bonerate	Marine National Park		Taka Bonerate	IDN141
South Sulawesi	TWA Cani Sirenreng	Nature Tourism Park	3,770	Cani Sirenreng	IDN133
South Sulawesi	TWA Danau Mahalano	Nature Tourism Park	2,299	Danau Mahalona	IDN096
South Sulawesi	TWA Danau Matano	Nature Tourism Park	23,085	Feruhumpenai — Matano	IDN095
South Sulawesi	TWA Danau Towuti	Nature Tourism Park	63,662	Danau Towuti	IDN097
South Sulawesi	TWA Lejja	Nature Tourism Park	1,575		
South Sulawesi	TWA Malino	Nature Tourism Park	3,494	Karaeng–Lompobattang	IDN138
South Sulawesi	TWA Nanggala III	Nature Tourism Park	969		
South Sulawesi	TWA Sidrap	Nature Tourism Park	284		
South Sulawesi	TWAL Kepulauan Kapoposang	Marine Nature Tourism Park		Kapoposang–Pangkep–Bulurokeng	IDN136
Central Sulawesi	CA Gunung Dako	Nature Reserve	20,309	Gunung Dako	IDN058
Central Sulawesi	CA Gunung Sojol	Nature Reserve	63,702	Gunung Sojol	IDN061
Central Sulawesi	CA Gunung Tinombala	Nature Reserve	34,772	Gunung Tinombala	IDN060
Central Sulawesi	CA Morowali	Nature Reserve	213,199	Morowali	IDN074
Central Sulawesi	CA Pangi Binangga	Nature Reserve	3,467	Pegunungan Tokalekaju	IDN066
Central Sulawesi	CA Tanjung Api	Nature Reserve	3,312	Tanjung Colo	IDN076
Central Sulawesi	SM Bakiriang	Wildlife Reserve	12,596	Bakiriang	IDN080

Province	Protected Areas Name	Designation	Area (ha)	KBA Name	Code
Central Sulawesi	SM Lombuyan	Wildlife Reserve	3,173		
Central Sulawesi	SM Pati Pati	Wildlife Reserve	1,872		
Central Sulawesi	SM Pinjan-Tanjung Matop	Wildlife Reserve	1,830	Gunung Dako	IDN058
Central Sulawesi	SM Pulau Dolangan	Wildlife Reserve	157		
Central Sulawesi	SM Tanjung Santigi	Wildlife Reserve	1,629		
Central Sulawesi	TB Landusa Tomata	Hunting Reserve	4,408		
Central Sulawesi	THR Sulteng	Forest Park	8,532	Pegunungan Tokalekaju	IDN066
Central Sulawesi	TN Lore Lindu	National Park	208,648	Lore Lindu, Pegunungan Tokalekaju	IDN067, IDN066
Central Sulawesi	TNL Kepulauan Togean	Marine National Park		Kepulauan Togean, Perairan Kepulauan Togean	IDN077, IDN078
Central Sulawesi	TWA Bancea	Nature Tourism Park	225	Danau Poso	IDN073
Central Sulawesi	TWA Wera	Nature Tourism Park	462	Pegunungan Tokalekaju	IDN066
South-east Sulawesi	CA Kakenauwe	Nature Reserve	836	Lambusango	IDN116
South-east Sulawesi	CA Lamedae	Nature Reserve	650	Lamadae	IDN103
South-east Sulawesi	CA Napabalano	Nature Reserve	10		
South-east Sulawesi	SM Buton Utara	Wildlife Reserve	90,923	Buton Utara	IDN115
South-east Sulawesi	SM Lambusango	Wildlife Reserve	27,301	Lambusango	IDN116
South-east Sulawesi	SM Tanjung Amolengo	Wildlife Reserve	621	Tanjung Peropa	IDN108
South-east Sulawesi	SM Tanjung Batikolo	Wildlife Reserve	3,925	Tanjung Batikolo	IDN110
South-east Sulawesi	SM Tanjung Peropa	Wildlife Reserve	39,494	Tanjung Peropa	IDN108
South-east Sulawesi	TB Padang Mata Osu	Hunting Reserve	8,060		
South-east Sulawesi	THR Murhum	Forest Park	7,821	Nipa-nipa	IDN106
South-east Sulawesi	TN Rawa Aopa Watumohai	National Park	106,182	Rawa Aopa Watumohai	IDN104
South-east Sulawesi	TNL Kepulauan Wakatobi	Marine National Park		Wakatobi, Perairan Wakatobi	IDN119, IDN120
South-east Sulawesi	TWA Mangolo	Nature Tourism Park	3,895	Mekongga	IDN101

Province	Protected Areas Name	Designation	Area (ha)	KBA Name	Code
South-east Sulawesi	TWA Tirta Rimba Air Jatuh	Nature Tourism Park	470	Lambusango	IDN116
South-east Sulawesi	TWAL Kepulauan Padamarang	Marine Nature Tourism Park		Kepulauan Padamarang	IDN102
South-east Sulawesi	TWAL Teluk Lasolo	Marine Nature Tourism Park		Teluk Lasolo — Labengki	IDN105
North Sulawesi	CA Gunung Ambang	Nature Reserve	19,673	Gunung Ambang	IDN035
North Sulawesi	CA Gunung Dua Sudara	Nature Reserve	5,080	Tangkoko Dua Sudara	IDN022
North Sulawesi	CA Gunung Lokon	Nature Reserve	1,658	Gunung Lokon	IDN030
North Sulawesi	CA Tangkoko Batuangus	Nature Reserve	4,524	Tangkoko Dua Sudara	IDN022
North Sulawesi	SM Gunung Manembo-nembo	Wildlife Reserve	6,731	Gunung Manembo-nembo	IDN031
North Sulawesi	SM Karakelang	Wildlife Reserve	29,502	Karakelang Selatan, Karakelang Utara	IDN004, IDN 003
North Sulawesi	TNL Bunaken	Marine National Park		Mawori, Molaswori, Perairan Arakan Wawontulap	IDN020, IDN021, IDN032

5.2. Protected Areas and Proposed Protected Areas in Timor-Leste

Protected Area	District	Area (approx.) (Ha)	UNTAET/ GotI*	Proposed GotI**	KBA
Parque Nacional NKS	Lautem	123,600	Yes	Yes	TLS001
Monte Legumau	Lautem, Baucau	35,967		Yes	TLS005
Lago Maurei	Lautem, Viqueuque	500		Yes	
Be Matan Irabere	Viqueque			Yes	TLS007
Monte Matebian	Baucau, Viqueque	24,000		Yes	TLS006
Monte Mundo Perdido	Viqueque	25,000		Yes	TLS010
Monte Laretame	Baucau, Viqueuque	16,429		Yes	
Monte Builo	Viqueuque	8,000		Yes	TLS009
Monte Burabo	Viqueuque	18,500		Yes	
Monte Aitana	Viqueque	17,000		Yes	TLS015
Monte Bibileo	Manatuto, Viqueque	19,000		Yes	TLS015
Monte Diatuto	Manatuto	15,000	Yes	Yes	TLS016
Monte Kuri	Manatuto			Yes	TLS013
Monte Cablaque	Manufahi, Ainaro	18,000		Yes	
Ribeira De Clere	Manufahi	30,000	Yes	Yes	TLS018
Lagoa Modomahut	Manufahi	22		Yes	
Lagoa Welenas	Manufahi	20		Yes	
Monte Manucoco	Dili	4,000	Yes	Yes	TLS024
Cristo Rei	Dili	1,558	Yes	Yes	TLS022
Lagoa Tasitolu	Dili		Yes	Yes	TLS027
Monte Fatumasin	Liquiça	4,000	Yes	Yes	TLS028
Monte Guguleur	Liquiça	13,159		Yes	
Lagoa Maubara	Liquiça			Yes	TLS029
Monte Tatamailau	Ainaro, Ermera	20,000	Yes	Yes	TLS020
Monte Talobu /Laumeta	Ainaro	15,000		Yes	
Monte Loelako	Bobonaro, Ermera	4,700		Yes	
Monte Tapo/Saburai	Bobonaro	5,000		Yes	
Lagoa Be Malae	Bobonaro			Yes	TLS032
Korluli	Bobonaro			Yes	
Monte Lakus	Bobonaro			Yes	
Monte Sabi	Bobonaro			Yes	
Monte Taroman	Covalima	19,155		Yes	
Reserva Tilomar	Covalima	5,776	Yes	Yes	TLS033
AP Cutete–Seli -Paineno	Oecusse	13,300		Yes	
Monte Manoleu	Oecusse	20,000		Yes	
Area Mangal Citrana	Oecusse	1,000		Yes	TLS035
Oebatan	Oecesse	400		Yes	
Ek Oni	Oecesse	700		Yes	
Oe Nopu	Oecesse			Yes	

Protected Area	District	Area (approx.) (Ha)	UNTAET/ GotI*	Proposed GotI**	KBA
Hau Bat	Oecesse			Yes	
Us Metan	Oecesse	200		Yes	
Oe Poto Alumbenu–Pais–Fif Na	Oecesse	30		Yes	
Nakome	Oecesse	20		Yes	
Lagoa We Tasi	Viqueque			Yes	
Monte Ulibere	Baucau			Yes	
Monte Sisu	Baucau			Yes	
Monte Esere	Baucau			Yes	
Area Mangal Metinaro	Dili			Yes	
Area Mangal Hera	Dili			Yes	
Lagoa Hasan Foun and Onu Bot	Covalima			Yes	

*: Protected areas declared under the U.N. administration are still valid but will be confirmed under the draft Protected Areas Law.
**: Listed in the annex of the draft Protected Areas Law (February 2014).

Appendix 6. Mapping of KBAs and Stakeholders

Table A6.1. KBAs Where Stakeholders Were Identified

Key:

- Stakeholders in **bold**: contribute directly to conservation.
- Stakeholders in *italics*: contribute indirectly to conservation.
- Stakeholders <u>underlined</u>: member or in partnership with other NGO/CSO.
- Empty cells: no stakeholder known.

		Stakeholders		
Code	**KBA Name**	**Private Sector**	**CSO**	**Others**
IDN012	Gunung Sahendaruman		**<u>KMPH</u>**	
IDN019	Likupang	Tourism and diving company, iron sand company (PT MMP)	**WCS, ecotourism group**	
IDN022	Tangkoko Dua Sudara		**Macaca nigra project, Tangkoko conservation, guiding groups**	**James Cook University** E-PASS (GEF/World Bank)
IDN023	Selat Lembeh	Diving center/resorts		
IDN037	Bogani Nani Wartabone		CSO, **WCS**	E-PASS (GEF/World Bank)
IDN041	Milangodaa		CSO	
IDN047	Tangale			University researchers
IDN049	Nantu	Local miners	**YANI**	**Gorontalo University** E-PASS (GEF/World Bank) ADM Capital Foundation, Starling Resources
IDN052	Panua	Mining company		
IDN054	Gunung Ile-Ile	Private		
IDN077	Perairan Kepulauan Togean		**CI**	
IDN078	Kepulauan Togean		**CI, Yayasan Toloka**	
IDN086	Balantak		**ALTO**	
IDN095	Feruhumpenai–Matano		IP group	
IDN096	Danau Mahalona	PT Vale		
IDN097	Danau Towuti	PT Vale		
IDN098	Routa	Mining companies (Rio Tinto, Inco, Antam), palm oil companies		
IDN101	Mekongga	Illegal logging and gold company, nickel and palm oil company		
IDN102	Kepulauan Padamarang	Mining company (Cinta Jaya)		
IDN104	Rawa Aopa Watumohai		**Yascita**, *CARE*, **LKM TNRAW, nature lovers group**	**UGM, Uhalu, IPB, ITB**

Code	KBA Name	Stakeholders		
		Private Sector	**CSO**	**Others**
IDN105	Teluk Lasolo—Labengki	Diving center/resorts, mining companies (PT Antam, Bumi Konawe Abadi)		
IDN106	Nipa-nipa	Water company	**Community forest management group**, **farmers groups**	**University researchers**
IDN107	Pulau Hari	Diving operators	CSO	
IDN108	Tanjung Peropa			**LIPI**
IDN110	Tanjung Batikolo			**LIPI, university researchers**
IDN111	Baito–Wolasi	Palm oil company (Merbau Raya)	**Community forest management group**	
IDN112	Pesisir Tinanggea	Mining company (Ifisdeco)		
IDN115	Buton Utara		Mitra, **ELSAIN**	**University researchers**
IDN117	Wabula	Diving operators		
IDN119	Perairan Wakatobi		**TNC/RARE, LPSM YASINTA**	
IDN120	Wakatobi	Diving operators	**Operation wallacea, KOMANANG**, FORKANI, KOMUNTO, FONEB, **TNC-WWF**	
IDN121	Pulau Batu Atas	Diving operators		
IDN122	Basilika	Diving operators		
IDN124	Gunung Watusangia	Mining company		
IDN125	Kepulauan Sagori	Diving operators		
IDN129	Pegunungan Latimojong		*AMAN,* hiking group	
IDN133	Cani Sirenreng		CSO	
IDN134	Bantimurung Bulusaraung		Hiking group, IP group	**UnHas**
IDN136	Kapoposang –Pangkep–Bulurokeng	Cement company (PT. Bosowa, PT. Semen Tonasa)	*Walhi Sulsel*; LBH Makassar; **JPIK (jaringan pemantau independen kehutanan)**	OXFAM Canada for Pangkep
IDN138	Karaeng–Lompobattang	Logging company	IP group	**University researchers**
IDN139	Kepulauan Selayar		CSO	**University researchers**
IDN141	Taka Bonerate		**Coremap**, CSO	**UnHas**
IDN142	Perairan Tana Jampea		CSO	
IDN143	Pulau Tana Jampea		CSO	
IDN145	Morotai		**PILAS**	
IDN149	Galela	Private		
IDN151	Pulau-pulau pesisir Tobelo		**Sahu groups**	
IDN153	Halmahera Timur		*AMAN*	
IDN156	Kao	PT Nusa Halmahera Mineral, PT Pantunggal/Barito	*AMAN*	
IDN158	Gamkonora	PT Orokni		
IDN163	Ternate	Private	**KAMU**, *Walhi*	
IDN164	Tidore	Private		

Code	KBA Name	Stakeholders		
		Private Sector	**CSO**	**Others**
IDN167	Dote–Kobe	Private		
IDN183	Danau Manis	PT GPS, PT Telaga Bakti		
IDN184	Wayaloar	PT Telaga Bakti	CSO	
IDN185	Gunung Batu Putih	PT Pusaka Agro, PT Poleko		
IDN187	Selat Obi	Private		
IDN209	Perairan Haruku–Saparua		**Kewang Negeri Haruku**	
IDN212	Manusela		*CIRAD/CIFOR*	EU
IDN217	Perairan Kepulauan Banda		**WWF, TNC, CI, CTC, WCS**	COREMAP–WB, Margaret A. Cargill Found. David and Lucille Packard Found.
IDN218	Kepulauan Banda		**CTC**	
IDN227	Batu Gendang	Tourism company, local mining		
IDN228	Perairan Batu Gendang	tourism company		
IDN229	Lombok Barat	Tourism company		
IDN230	Gili Ayer –Meno–Trawangan		**WCS, RARE**	Waitt Foundation
IDN231	Gunung Rinjani	**Guide groups**	**WWF, FFI,** *Santiri*, **customary communities**	**Mataram University**
IDN232	Gili Sulat–Gili Lawang	Tourism company	**JARI**	
IDN233	Perairan Bumbang	Tourism company, pearl, fishing industry		
IDN234	Bumbang	Private	**CSO**	
IDN235	Sekaroh	Tourism company	**Koica, STN**	**University researchers**
IDN236	Lunyuk Besar	Private	**Tortoises group**	
IDN237	Tatar Sepang	PT Newmont, PT Indotan, local mining company	**CSO**	
IDN238	Taliwang	PT Newmont, PT Indotan, local mining company	**CSO**	
IDN240	Pulau Panjang	Illegal mining, squid company	Magma	**Universitas Sumbawa**
IDN241	Puncak Ngengas	Mining company (PT NTT), honey company (UD Samawa Batulanteh), water company	Dodo, Cek Bocek, Lembaga Adat Samawa, Pakasa	
IDN242	Dodo Jaranpusang	Mining company	Dodo, Cek Bocek, Lembaga Adat Samawa, Pakasa, LOH, AR	
IDN243	Perairan Pulau Moyo	Hotels	CSO	
IDN246	Gunung Tambora	Sawmill company	FPPD, *Lumbung*, **interest groups**	Vulcanology researchers
IDN247	Nisa–Teluk Saleh		Fishermen groups	
IDN248	Empang	PT Sumbawa Sejuta Raya		
IDN250	Perairan Parado		CSO	
IDN251	Teluk Waworada		Seaweed cooperative	

Code	KBA Name	Stakeholders		
		Private Sector	**CSO**	**Others**
IDN252	Perairan Bajo		*LP2MP*	
IDN257	Rokoraka–Matalombu		IP group	
IDN258	Cambaka		YSD, YHS	
IDN260	Yawila		IP group	
IDN262	Poronumbu		*Pakta*, **Satu Visi, Bahtera, Forum Poronombu**	
IDN263	Pantai Mananga Aba–Pantai Waeketo	Sand miners, ASDP, Pelni	**Fishermen and farmers groups, Donders,** Wahana Visi Indonesia	
IDN264	Kaliasin	Private	**Wahana, Pelita, Foremba**	
IDN265	Lokusobak		**Wahana, Pelita, Foremba**	
IDN266	Baliledo		Bahtera	
IDN267	Pahudu Tilu	PT Fathi Resources	**Wahana, Foremba, Pelita, Satu Visi**	
IDN268	Manupeu Tanadaru	Gold mining company	**JAMATADA, KMPH**	JICA
IDN269	Tangairi–Lukulisi–Konda Maloba	Private	**KMPH**	
IDN271	Tarimbang			University researchers
IDN273	Praipaha Mandahu			University researchers
IDN274	Yumbu–Kandara	Fishing companies	*Koppesda*, **Tananua**, *BTT*	
IDN275	Laiwanggi Wanggameti	Gold mining company	CSO, *BTT*, community forum, **KMPH**, *Koppesda*	
IDN277	Tanjung Ngunju	Private		
IDN278	Perairan Tanjung Ngunju	Private		
IDN280	Komodo–Rinca		**TNC/RARE, WWF**	
IDN282	Wae Wuul		**FPKM**	
IDN284	Mbeliling–Tanjung Kerita Mese		**FPKM,** Yakines	
IDN285	Sesok		**FPKM**	
IDN286	Nangalili		**FPKM**	
IDN298	Kelimutu	Hotels, resorts		
IDN310	Flores Timur		**WWF**	COREMAP–WB, Margaret A Cargill Found.,
IDN313	Lembata		*Pikul*, **KLOMPAALD**, *Catholic groups*	
IDN315	Pantar		*Pikul*	
IDN320	Perairan Alor Utara		*Pikul*, **WWF**	Margaret A. Cargill Foundation
IDN336	Tanimbar Tengah		Baileo	
IDN341	Gunung Mutis		**WWF**, *OAT,* **Yay. Peduli Sanlima, Yay. Timor Membangun (YTM)**	KYEEMA Foundation by AusAID
IDN352	Rote Utara		Pikul	
TLS001	Nino Konis Santana	Private	**Haburas Foundation, CI**	Spanish Bilateral Aid Agency, GIZ, UNESCO,

Code	KBA Name	Stakeholders		
		Private Sector	**CSO**	**Others**
TLS002	Perairan Nino Konis Santana		**Haburas Foundation, CI**	GIZ, UNESCO
TLS003	Nari	Mining company	CSO, **interest groups**	University researchers
TLS004	Raumoco		CSO, **interest groups**	**University researchers**
TLS007	Irabere–Iliomar		IP group	
TLS008	Perairan Irabere–Iliomar		IP group	
TLS010	Mundo Perdido	Water company	CSO	
TLS015	Monte Aitana–Bibileo	Rock and sand mining company, sawmill company, large scale farm		GIZ
TLS016	Monte Diatuto		IP group	
TLS017	Monte Mak Fahik–Sarim		IP group	
TLS022	Areia Branca no Dolok Oan	Hotels and restaurants	**Haburas Foundation**	
TLS027	Tasitolu	Hotels and divers	**Santalum**	
TLS029	Maubara	Mos Bele and Laloran tourism groups	**Rai Maran Foundation, Hadere**	
TLS030	Perairan Maubara	Tourism group	**NGO Hadere, Rai Maran**	
TLS031	Perairan Be Malae	Restaurants	**Haburas Foundation**	
TLS032	Be Malae		**Haburas Foundation**	
TLS033	Tilomar		IP group	

Table A6.2. List of KBAs Where No Stakeholders Were Identified

KBA #	KBA Name	Code	KBA Name	Code	KBA Name
IDN001	Kepulauan Nanusa	IDN091	Buya	IDN245	Perairan Pulau Satonda
IDN002	Perairan Karakelang Utara	IDN092	Loku	IDN254	Sangiang
IDN003	Karakelang Utara	IDN093	Sanana	IDN255	Gili Banta
IDN004	Karakelang Selatan	IDN094	Pulau Lifamatola	IDN256	Pero
IDN005	Pulau Salibabu	IDN099	Lamiko-miko	IDN261	Lamboya
IDN007	Pulau Kabaruan	IDN100	Perairan Lamiko-miko	IDN276	Pulau Salura–Mangkudu - Kotak
IDN010	Gunung Awu	IDN109	Pulau Wawonii	IDN279	Luku Melolo
IDN011	Tahuna	IDN113	Selat Tiworo	IDN281	Perairan Komodo–Rinca
IDN014	Perairan Siau	IDN114	Muna Timur	IDN283	Nggorang Bowosie
IDN015	Pulau Siau	IDN116	Lambusango	IDN287	Todo Repok
IDN020	Molaswori	IDN118	Ambuau	IDN288	Ruteng
IDN024	Lembeh	IDN123	Pulau Kadatua	IDN289	Gapong
IDN025	Gunung Klabat	IDN126	Mambuliling	IDN290	Pota
IDN026	Tulaun Lalumpe	IDN127	Mamuju	IDN291	Nangarawa
IDN027	Danau Tondano	IDN128	Perairan Mamuju	IDN292	Gunung Inerie
IDN028	Soputan–Manimporok	IDN130	Danau Tempe	IDN293	Aegela
IDN029	Mahawu–Masarang	IDN146	Pulau-pulau Pesisir Morotai	IDN294	Wolo Tado
IDN030	Gunung Lokon	IDN147	Pulau Rao	IDN295	Riung 17 Pulau

KBA #	KBA Name	Code	KBA Name	Code	KBA Name
IDN031	Gunung Manembo-nembo	IDN154	Hutan Bakau Dodaga	IDN296	Pulau Ontoloe
IDN032	Perairan Arakan Wawontulap	IDN165	Aketajawe	IDN297	Mausambi
IDN033	Amurang	IDN169	Kayoa	IDN299	Paga
IDN035	Gunung Ambang	IDN171	Kasiruta	IDN300	Tanjung Watu Mana
IDN038	Tanjung Binerean	IDN172	Yaba	IDN301	Gunungsari
IDN042	Puncak Botu	IDN174	Saketa	IDN350	Semau
IDN048	Muara Paguyaman Pantai	IDN175	Kepulauan Widi	IDN356	Pulau Dana
IDN053	Popayato –Paguat	IDN177	Tutupa	TLS005	Legumau
IDN055	Tanjung Panjang	IDN178	Gunung Sibela	TLS006	Monte Matebian
IDN068	Perairan Kayumaloa	IDN179	Mandioli	TLS013	Subaun
IDN071	Lariang	IDN181	Selat Obilatu–Malamala	TLS014	Laleia
IDN072	Pambuang	IDN182	Obilatu	TLS018	Sungai Klere
IDN088	Pulau Seho	IDN186	Cabang Kuning	TLS020	Monte Tatamailau
IDN089	Taliabu Utara	IDN188	Pulau Obit	TLS021	Leimia Kraik
IDN090	Perairan Taliabu Utara	IDN244	Pulau Moyo		

Table A6.3. List of KBAs Confirmed Post-workshop (and therefore stakeholders not discussed detail with workshop participants)

Code	KBA Name	Code	KBA Name	Code	KBA Name
IDN006	Perairan Talaud Selatan	IDN157	Teluk Buli	IDN306	Gunung Lewotobi
IDN008	Kawaluso	IDN159	Tanjung Bobo	IDN307	Pantai Selatan Lebau
IDN009	Perairan Sangihe	IDN160	Tanah Putih	IDN308	Larantuka
IDN013	Mahangetang	IDN161	Rawa Sagu Ake Jailolo	IDN309	Tanjung Watupayung
IDN016	Perairan Tagulandang	IDN162	Ternate–Hiri	IDN311	Perairan Lembata
IDN017	Perairan Biaro	IDN166	Weda Telope	IDN312	Lamalera
IDN018	Perairan Likupang	IDN168	Perairan Dote-Kobe	IDN314	Selat Pantar
IDN021	Mawori	IDN170	Pulau Kayoa	IDN316	Pantar Utara
IDN034	Gunung Sinonsayang	IDN173	Gorogoro	IDN317	Gunung Muna
IDN036	Gunung Simbalang	IDN176	Libobo	IDN318	Perairan Gunung Muna
IDN039	Perairan Tanjung Binerean	IDN180	Perairan Mandioli	IDN319	Mainang
IDN040	Pantai Modisi	IDN189	Perairan Pulau Obit	IDN321	Tuti Adagae
IDN043	Molonggota	IDN190	Jorongga	IDN322	Kunggwera
IDN044	Perairan Molonggota	IDN191	Liliali	IDN323	Pulau Redong
IDN045	Perairan Mas Popaya Raja	IDN192	Gunung Kepala Madang	IDN324	Gunung Arnau
IDN046	Mas Popaya Raja	IDN193	Waemala	IDN325	Danau Tihu
IDN050	Dulamayo	IDN194	Danau Rana	IDN326	Kepulauan Kisar
IDN051	Perairan Panua	IDN195	Leksula	IDN327	Pulau Romang
IDN056	Perairan Tanjung Panjang	IDN196	Teluk Kayeli	IDN328	Perairan Kepulauan Lemola

Code	KBA Name	Code	KBA Name	Code	KBA Name
IDN057	Buol–Tolitoli	IDN197	Perairan Teluk Kayeli	IDN329	Kepulauan Lemola
IDN058	Gunung Dako	IDN198	Kelang–Kassa–Buano–Marsegu	IDN330	Kepulauan Sermatang
IDN059	Teluk Dondo	IDN199	Pulau Buano	IDN331	Kepulauan Damar
IDN060	Gunung Tinombala	IDN200	Gunung Sahuwai	IDN332	Pulau Damar
IDN061	Gunung Sojol	IDN201	Luhu	IDN333	Kepulauan Babar
IDN062	Siraro	IDN202	Tullen Batae	IDN334	Pulau Babar
IDN063	Perairan Maputi	IDN203	Pulau Kassa	IDN335	Perairan Angwarmase
IDN064	Pasoso	IDN204	Pegunungan Paunusa	IDN337	Selat Yamdena
IDN065	Tanjung Manimbaya	IDN205	Gunung Salahutu	IDN338	Pulau Larat
IDN066	Pegunungan Tokalekaju	IDN206	Perairan Gunung Salahutu	IDN339	Kepulauan Larat-Fordata
IDN067	Lore Lindu	IDN207	Leitimur	IDN340	Kateri–Maubesi
IDN069	Tambu	IDN208	Leihitu	IDN342	Buat–Soe
IDN070	Perairan Tambu	IDN210	Haruku	IDN343	Oenasi
IDN073	Danau Poso	IDN211	Saparua	IDN344	Manipo
IDN074	Morowali	IDN213	Waebula	IDN345	Camplong
IDN075	Gunung Lumut	IDN214	Tanah Besar	IDN346	Gunung Timau
IDN076	Tanjung Colo	IDN215	Perairan Tanah Besar	IDN347	Bipolo
IDN079	Perairan Pagimana	IDN216	Kepulauan Gorom	IDN348	Perairan Teluk Kupang
IDN080	Bakiriang	IDN219	Perairan Kepulauan Tayandu	IDN349	Teluk Kupang
IDN081	Perairan Peleng–Banggai	IDN220	Kepulauan Tayandu	IDN351	Perairan Rote Utara
IDN082	Labobo–Bangkurung	IDN221	Perairan Tual	IDN353	Danau Peto
IDN083	Kokolomboi	IDN222	Pegunungan Daab–Boo	IDN354	Rote Barat Daya
IDN084	Bajomote–Pondipondi	IDN223	Pulau Manuk	IDN355	Perairan Pulau Dana
IDN085	Timbong	IDN224	Perairan Pulau Manuk	TLS009	Monte Builo
IDN087	Perairan Balantak	IDN225	Kepulauan Lucipara	TLS011	Kaibada
IDN103	Lamadae	IDN226	Pulau Gunung Api	TLS012	Perairan Subaun
IDN131	Pallime	IDN239	Sumbawa Barat	TLS019	Perairan Sungai Klere
IDN132	Perairan Pallime	IDN249	Perairan Empang	TLS023	Perairan Areia Branca no Dolok Oan
IDN135	Bulurokeng	IDN253	Pulau Ular	TLS024	Atauro Island
IDN137	Komara	IDN259	Danggamangu	TLS025	Perairan Atauro
IDN140	Pulau Selayar	IDN270	Perairan Tarimbang	TLS026	Perairan Tasitolu
IDN144	Pulau Kalatoa	IDN272	Lai Kayambi	TLS028	Fatumasin
IDN148	Loloda	IDN302	Teluk Maumere	TLS034	Perairan Tilomar
IDN150	Gunung Dukono	IDN303	Pulau Besar	TLS035	Citrana
IDN152	Jara-jara	IDN304	Egon Ilimedo		
IDN155	Teluk Wasile	IDN305	Ili Wengot		

Appendix 7. Baseline CSO Capacity Assessment

Eight-seven completed questionnaires were received from CSOs in Indonesia and nine from Timor-Leste. Of the total 96 questionnaires, more than two-thirds were people's organizations (POs, See Chapter 7 for definition), with the rest being NGOs, private sector and others (Table A9.1). Two-thirds of POs have fewer than 10 staff members and a third have a budget of less than $10,000 a year. NGOs are somewhat larger, with between 5 and 50 staff members, and budgets typically in the range of $50,000 to $100,000 or more. It was notable that the research organizations — mostly university departments — had similar capacity to the the POs, with limited staff, and none with a budget of more than $50,000.

Asked about their interest in conservation, 87 replied, with 78 (80 percent) describing themselves as "very interested," seven (8 percent) as "quite interested," and two (2 percent) as "somewhat interested," with none choosing "not particularly."

Table A7.1. Overview of Organizations Participating in the Survey

Type of Organization	Number	Range of Staff	Range of Annual Budget (in $)
PO	67	18 (27%) have 1 – 5 staff 26 (39%) have 5 –10 staff 19 (28%) have 10 – 50 staff	26 (39%) have a budget < 10,000 US$ 34 (51%) have a budget of $10,000–50,000
NGO	7	Three have staffs of 5 –10 Four have staffs of 10 – 50	One has a budget of $10,000–50,000 Three have a budget of $50,000–100,000 Three have budgets more than $100,000
Private sector	3	One has a staff of 5 –10 Two have staffs of 10–50	One has a budget of less than $10,000 Two have budgets of $10,000–$50,000
Media	5	One has a staff of fewer than five Three have staffs of 10 – 50	Two have budgets of less than $10,000 One has a budget of $10,000 – $50,000 Two have a budget of T50,000 $100,000
Research	11	One has a staff of fewer than five Five have staffs of 5 –10 Four have staffs of 10 –50	One has a budget less than $10,000 Nine have budgets of $10,000 – $50,000
Religious	3	One has a staff of fewer than five One has a staff of 5 –10 1 has a staff of more than 50	1 has a budget of less than $10,000 1 has a budget of $10,000 –$50,000 1 has a budget of $50,000 – $100,000

To provide further data on the group which is most likely to be the target of CEPF capacity-building, the 96 questionnaires were filtered using the following criteria:

- "Interest in conservation" rated themselves as "very interested."
- Annual budget less than $10,000.

This resulted in a subset of 32 Indonesian organizations and two from Timor-Leste. The results of the self-assessment of internal capacity for these organizations are in Table A9.2. . The majority of organizations considered they have “adequate” financial management, although almost as large a number rated their financial management “weak.” Personnel management, activity planning and monitoring/lessons learning were all considered to be “developing” by the majority of organizations. Almost all organizations consider that their fund-raising capacity is “weak/limited” or “developing.”

Table A7.2. Results of a Self-assessment of Internal Capacity by 34 Small POs

	Self-evaluation of Capacity				
Area of Capacity	**Weak / Limited**	**Developing**	**Adequate**	**Very Good / Strong**	**No reply**
Finance management	10	6	**13**		5
Personnel management & development	6	**12**	8	4	4
Activity planning	5	**13**	6	5	5
Fund raising	**15**	12	2	1	4
Monitoring and lesson learning	7	**11**	9	2	4
Knowledge management	8	**9**	7	6	4

Appendix 8. CEPF Global Monitoring Framework

Baseline at November 2013 and Notes Linking to the Ecosystem Profile Text

Impact Category	Subcategory	Indicator No.	Indicator Title	Means of Measurement	Data source	Frequency	Baseline (November 2013) and Notes
Biodiversity — what changes in biodiversity status have taken place?	Species	1	Change in Red List Index	RLI calculation	IUCN Red List of threatened species	Beginning and end of investment	Red List Status at November 30 2013. See note on baseline in Chapter 4
		2	Change in threat levels of target species	Threat rating scale	Grantee reports	Beginning, middle and end of investment	Baseline species list in Chapter 4
	Sites	3	Change in habitat extent (sites)	Remote sensing	Contracted party remotely sensed data	Beginning and end of investment	Baseline notes in Chapter 4
		4	Change in number of hectares of KBAs with strengthened protection and management	Count — addition	Site area from profile + cross reference with METT I score	Yearly	Baseline in Chapter 10
		5	Change in number of hectares newly protected	Count — addition	Site area — from profile	Yearly	See notes in Chapter 4 on baseline level
		6	Change in threat levels of target sites	Threat rating scale	Grantee reports	Beginning, middle, end of investment	See notes in Chapter 4 on baseline level
	Corridors	7	Change in habitat extent	Remote sensing	Contracted party remotely sensed data	Beginning and end of investment	See notes in Chapter 4 on baseline level
		8	Change in the number of hectares in production landscapes managed for biodiversity conservation	Count — addition	Corridor area from profile	Yearly	See notes in Chapter 4 on baseline level
Human well-being — have people benefited from CEPF investment?	Direct beneficiaries	9	Change in the number of direct beneficiaries	Grantee assessment	Grantee reports	Yearly	Baseline = 0 See notes in Chapter 5
		10	Change in number of communities benefitting	Grantee assessment	Grantee reports	Yearly	Baseline = 0 See notes in Chapter 5
	Indirect benefits	11	Change in the amount of CO2e stored at CEPF invested sites	Analysis from remotely sensed data	Contracted party remotely sensed data	Beginning and end of investment	Baseline = 0 See notes in Chapter 5
		12	Change in the amount of fresh water secured at CEPF invested sites and delivered to downstream users	Analysis from remotely sensed data	Contracted party remotely sensed data	Beginning and end of investment	Baseline = 0 See notes in Chapter 5

Impact Category	Subcategory	Indicator No.	Indicator Title	Means of Measurement	Data source	Frequency	Baseline (November 2013) and Notes
Conditions for Sustainability — will any gains be sustained?	Regulatory environment	13	Change in number of policies (legislative, regulatory, or strategic) that include provisions for conservation management	Count — addition	Written documents	Yearly	Baseline detailed in Chapter 6
	Long-term financing	14	Change in number of sustainable finance mechanisms with improved management	LTF tracking tool	RIT report	Beginning and end of investment	Baseline = 0 See notes in chap 10
		15	Change in $$ housed in sustainable finance mechanisms	Count — addition	RIT report	Yearly	Baseline = 0 See notes in Chapter 10
		16	Change in the financial performance of funds	Financial reports	Financial reports	Yearly	Baseline = 0 See notes in Chapter 10
		17	Change in the timing of financial delivery of funds to conservation projects	Financial reports	Financial reports	Yearly	Baseline = 0 See notes in Chapter 10
	Conservation best practice	18	Change in the number of sites (protected areas) with improved management	Mett i	Mett i	Beginning, middle and end of investment	Baseline = existing METT score (not available), See notes in Chapter 4
		19	Change in the number of best management practices	Count	Reports and verification documents	Beginning, middle and end of investment	Baseline = 0 See notes in Chapter 4
Civil society — has civil society been strengthened?	Individual organizations	20	Change in the number and percent of CEPF grantees with improved organizational capacity	Civil society tracking tool	Civil society tracking tool	Beginning and end of investment	Baseline = 0 See notes in Chapter 7
	Collective group	21	Change in the collective civil society capacity at relevant scale	Civil society collective assessment tool	Civil society collective assessment tool	Beginning and end of investment	See notes in Chapter 7
		22	Change in the number of networks and partnerships	Count	Grantee reports	Beginning, end of investment	See notes in Chapter 7
		23	Change in the ability of civil society to respond to emerging issues	RIT assessment	Grantee reports	Beginning, middle and end of investment	See notes in Chapter 7

Appendix 9. CEPF Long-Term Monitoring Goals

Baseline at November 2013

Goal 1: Conservation Priorities. Global conservation priorities (i.e., globally threatened species, Key Biodiversity Areas (KBAs) and conservation corridors) and best practices for their management are identified, documented, disseminated and used by public sector, civil society and donor agencies to guide their support for conservation in the region.

Criterion	Baseline (2013)		Mid-term (year)		Final (year)		Notes on Baseline
1. Globally threatened species. Comprehensive global threat assessments conducted for all terrestrial vertebrates, vascular plants and at least selected freshwater taxa [further information: Chapter 4]	X	Not met		Not met		Not met	% terrestrial vertebrate assessed: 76% % vascular plants assessed: 2.5% % freshwater shrimps assessed: 36% % birdwing butterflies assessed: 12%
		Partially met		Partially met		Partially met	
		Fully met		Fully met		Fully met	
2. Key Biodiversity Areas. KBAs identified in all countries and territories in the region, covering, at minimum, terrestrial, freshwater and coastal ecosystems. [further information: Chapter 4]		Not met		Not met		Not met	KBAs identified for terrestrial, freshwater and marine environments in all countries in the hotspot. Civil society and government support not yet "broad based"
	x	Partially met		Partially met		Partially met	
		Fully met		Fully met		Fully met	
***3. Conservation corridors*.** Conservation corridors identified in all parts of the region where contiguous natural habitats extend over scales greater than individual sites, and refined using recent land cover data. [further information: Chapter 4]		Not met		Not met		Not met	Corridors identified for all relevant terrestrial biomes. Civil society and government support not yet "broad based"
	x	Partially met		Partially met		Partially met	
		Fully met		Fully met		Fully met	
4. Conservation plans. Global conservation priorities incorporated into national or regional conservation plans or strategies developed with the participation of multiple stakeholders. [further information: Chapter 6]	X	Not met		Not met		Not Met	Conservation outcomes analysis results have been communicated to the NBSAP authority in Indonesia and Timor-Leste, but the documents have not yet been finalized
		Partially met		Partially met		Partially met	
		Fully met		Fully met		Fully met	
5. Management best practices. Best practices for managing global conservation priorities (e.g., sustainable livelihoods projects, participatory approaches to park management, invasive	x	Not met		Not met		Not met	Indonesia: • 16% of the terrestrial KBA falls within protected areas that have a dedicated management unit
		Partially met		Partially met		Partially met	
		Fully met		Fully met		Fully met	

Criterion	Baseline (2013)		Mid-term (year)		Final (year)		Notes on Baseline
species control) are introduced, institutionalized, and sustained at CEPF priority KBAs and corridors. [further information: Chapter 4]							• 14% of terrestrial KBA area fall within protected areas that have no management unit • 70% of terrestrial KBA area falls outside protected areas

Goal 2: Civil Society. Local and national civil society groups dedicated to conserving global conservation priorities collectively possess sufficient organizational and technical capacity to be effective advocates for, and agents of, conservation and sustainable development for at least the next 10 years.

Criterion	Baseline (baseline)		Mid-term (year)		Final (year)		Notes on Baseline
1. Human resources. Local and national civil society groups collectively possess technical competencies of critical importance to conservation. [further information: Chapter 7]	X	Not Met		Not met		Not Met	Important gaps in CSO capacity are: • Advocacy on planning and policy issues • Research and investigation, including biodiversity survey and monitoring, conservation planning • Technical skills for conservation and development interventions • Networking, knowledge management and data sharing • Internal capacity including financial management and fundraising
		Partially met		Partially met		Partially met	
		Fully met		Fully met		Fully met	
2. Management systems and strategic planning. Local and national civil society groups collectively possess sufficient institutional and operational capacity and structures to raise funds for conservation and to ensure the efficient management of conservation projects and strategies. [further information: Chapter 7]	X	Not met		Not met		Not Met	An estimated 39% of KBAs have an NGO, 30% a community group, 52% a private sector actor. The proportion dedicated to conservation of the site and thought to have adequate capacity for this is unknown but probably less than 10% of KBAs
		Partially met		Partially met		Partially met	
		Fully met		Fully met		Fully met	
3. Partnerships. Effective mechanisms exist for conservation-focused civil society groups to work in partnership with one another, and through	X	Not met		Not met		Not met	Partnerships and networks identified for conservation of specific KBAs: see notes in Chapter 7
		Partially met		Partially met		Partially met	
		Fully met		Fully met		Fully met	

Criterion	Baseline (baseline)		Mid-term (year)		Final (year)		Notes on Baseline
networks with local communities, governments, the private sector, donors, and other important stakeholders, in pursuit of common objectives. [further information: Chapter 7]							
4. Financial resources. Local civil society organizations have access to long-term funding sources to maintain the conservation results achieved via CEPF grants and/or other initiatives, through access to new donor funds, conservation enterprises, memberships, endowments, and/or other funding mechanisms. [further information: Chapter 7]	X	Not met		Not met		Not met	KBA are estimated to have a funding source for conservation thru CSOs. See notes in Chapter 10
		Partially met		Partially met		Partially met	
		Fully met		Fully met		Fully met	
5. Transboundary cooperation. In multi-country hotspots, mechanisms exist for collaboration across political boundaries at site, corridor and/or national scales.	X	Not met		Not met		Not met	Limited examples of transboundary cooperation, e.g., on watershed management
		Partially met		Partially met		Partially met	
		Fully met		Fully met		Fully met	

Goal 3: Sustainable Financing. Adequate and continual financial resources are available to address conservation of global priorities for at least the next 10 years.

Criterion	Baseline (2013)		Mid-term (year)		Final (year)		Notes on Baseline
1. Public sector funding. Public sector agencies responsible for conservation in the region have a continued public fund allocation or revenue-generating ability to operate effectively. [further information: Chapter 10]	X (T-L)	Not met		Not met		Not met	**Indonesia**: MoFor has significant funding for protected areas, MoEnv, and the Institute of Science have limited funding for their roles **Timor-Leste**: the Dept of Wildlife and Conservation has minimal funding and staff, and cannot function in the field. The Environment Directorate has inadequate resources for its policy role.
	X (IND)	Partially met		Partially met		Partially met	
		Fully met		Fully met		Fully met	
2. Civil society funding. Civil society organizations engaged in conservation in the region have access to sufficient funding to continue their work at current levels. [further information: Chapter 10]	X (T-L)	Not met		Not met		Not met	Indonesia: Marine: • WWF — OK • TNC/Rare — OK • WCS — not certain • Coral Triangle Center — OK • Wetlands International — OK Terrestrial: • Burung Indonesia — OK • ALTO — not certain • YANI — not certain Timor-Leste: • CI — not certain • Haburas — not certain
	X (IND)	Partially met		Partially met		Partially met	
		Fully met		Fully met		Fully met	
3. Donor funding. Donors other than CEPF have committed to providing sufficient funds to address global conservation priorities in the region. [further information: Chapter 10]	X	Not met		Not met		Not met	Indonesia: Marine: • Adequate for Lesser Sunda — Banda • Inadequate for North Sulawesi, North Maluku Terrestrial: • Funding for ** KBAs for the next five years secured
		Partially met		Partially met		Partially met	
		Fully met		Fully met		Fully met	

Criterion	Baseline (2013)		Mid-term (year)		Final (year)		Notes on Baseline
							• Inadequate funding for all other areas Tmor-Leste: • Inadequate funding
4. Livelihood alternatives. Local stakeholders affecting the conservation of biodiversity in the region have economic alternatives to unsustainable exploitation of natural resources.	X	Not met		Not met		Not met	Data limited, but no evidence that a significant number of stakeholders at KBAs have incentives/alternatives to allow pro-conservation behaviour change
		Partially met		Partially met		Partially met	
		Fully met		Fully met		Fully met	
5. Long-term mechanisms. Financing mechanisms (e.g., trust funds, revenue from the sale of carbon credits) exist and are of sufficient size to yield continuous long-term returns for at least the next 10 years.	X	Not met		Not met		Not met	No sustainable funding mechanisms exist No significant funding yielded from PES or other schemes
		Partially met		Partially met		Partially met	
		Fully met		Fully met		Fully met	

Goal 4: Enabling Environment. Public policies, the capacity to implement these, and the systems of governance in each individual country are supportive of the conservation of global biodiversity.

Criterion	Baseline (2013)		Mid-term (year)		Final (year)		Notes on Baseline
1. Legal environment for conservation. Laws exist that provide incentives for desirable conservation behavior and disincentives against undesirable behavior.		Not met		Not met		Not met	** Comparison of country committments under MEAs and laws
		Partially met		Partially met		Partially met	
		Fully met		Fully met		Fully met	
2. Legal environment for civil society. Laws exist that allow for civil society to engage in the public policy-making and implementation process.		Not met		Not met		Not met	No significant legal impediments to the effective operation of CSOs in Indonesia or Timor-Leste
		Partially met		Partially met		Partially met	
	X	Fully met		Fully met		Fully met	
3. Education and training. Domestic programs exist that produce trained environmental managers at secondary, undergraduate, and advanced academic levels.		Not met		Not met		Not met	All senior leadership positions in environment / conservation agency in Indonesia or Timor-Leste are staffed by nationals. [note that this is not an effective indicator of the Criterion]
		Partially met		Partially met		Partially met	
	X	Fully met		Fully met		Fully met	
4. Transparency. Relevant public sector agencies use participatory, accountable, and publicly reviewable process to make decisions regarding use of land and natural resources.	X	Not met		Not met		Not met	Indonesia and T-L: specific policy formulation processes (e.g., NBSAP) seek public *input*, but decisions are not made public until after they are finalized and data is not widely and freely available. Timor-Leste:
		Partially met		Partially met		Partially met	
		Fully met		Fully met		Fully met	
5. Enforcement. Designated authorities are clearly mandated to manage the protected area system(s) in the region and conserve biodiversity outside of them, and are empowered to implement the enforcement continuum of education, prevention, interdiction, arrest, and prosecution.	X	Not met		Not met		Not met	Indonesia: **% of formal protected areas have been fully gazetted and demarcated. Patrol frequency is not known but is believed to be infrequent. Timor-Leste: one formal protected areas has
		Partially met		Partially met		Partially met	
		Fully met		Fully met		Fully met	

Criterion	Baseline (2013)		Mid-term (year)		Final (year)		Notes on Baseline
							been demarcated, patrolling is limited

Goal 5: Responsiveness to Emerging Issues. Mechanisms exist to identify and respond to emerging conservation issues.

Criterion	Baseline (2013)		Mid-term (year)		Final (year)		Notes on Baseline
1. Biodiversity monitoring. Nationwide or region-wide systems are in place to monitor status and trends of the components of biodiversity. [further information: Chapter 4]	X	Not met		Not met		Not Met	Indonesia: no species or habitat specific monitoring exists, with the exception of 6 target species where there is an effort to monitor populations at key protected areas
		Partially met		Partially met		Partially met	
		Fully met		Fully met		Fully met	
2. Threats monitoring. Nationwide or region-wide systems are in place to monitor status and trends of threats to biodiversity.	X	Not met		Not met		Not met	No system are in place for monitoring threats. Third party systems (e.g. GFW2) are becoming available to monitor deforestation
		Partially met		Partially met		Partially met	
		Fully met		Fully met		Fully met	
3. Ecosystem services monitoring. Nationwide or region-wide systems are in place to monitor status and trends of ecosystem services.	X	Not met		Not met		Not met	No systems are in place to monitor environmental services
		Partially met		Partially met		Partially met	
		Fully met		Fully met		Fully met	
4. Adaptive management. Conservation organizations and protected area management authorities demonstrate the ability to respond promptly to emerging issues.	??	Not met		Not met		Not met	No information is known which demonstrates adaptive management, but information is lacking
		Partially met		Partially met		Partially met	
		Fully met		Fully met		Fully met	
5. Public sphere. Conservation issues are regularly discussed in the public sphere, and these discussions influence public policy.		Not met		Not met		Not met	Indonesia: forest and marine conservation linked to carbon, climate change, land rights are regularly discussed and are significant policy issues for the Forestry Minister, Marine affairs Minister and President. Timor-Leste: forest and marine conservation is discussed in the context of livelihood issues, but appears to have a limited impact on policy-making
	X (T-L)	Partially met		Partially met		Partially met	
	X (IND)	Fully met		Fully met		Fully met	